ENCLOSURE 2

VOLUME 8

ST. LUCIE PLANT
UNIT 1 AND UNIT 2

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.3
INSTRUMENTATION

Revision 0

LIST OF ATTACHMENTS

ATTACHMENT 1

3.3.1, Reactor Protective System (RPS) Instrumentation

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

3/4.3 INSTRUMENTATION

SYSTEM (RPS)

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.1

3.3.1.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1~~ shall be OPERABLE.

Four RPS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.1-1

A02

Applicability

APPLICABILITY: As shown in Table 3.3-1.

Add proposed ACTIONS note.

A03

ACTIONS

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1
SR 3.3.1.2
SR 3.3.1.3
SR 3.3.1.4
SR 3.3.1.5
SR 3.3.1.6
SR NOTE

4.3.1.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.3-1.

SR 3.3.1.7

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

SR 3.3.1.8

SR 3.3.1.9

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. ~~Each test shall include at least one channel per function.~~

SR 3.3.1.9 NOTE

A04

Table 3.3.1-1

TABLE 3.3-1

REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION - OPERATING

LA01 LA01 A02

OR OTHER SPECIFIED CONDITIONS

ITS	FUNCTION~~AL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM CHANNELS OPERABLE~~	APPLICABLE MODES	ACTION	
LCO 3.3.1 Applicability							
	1. Manual Reactor Trip	2	1	2	1, 2 and *	1	See ITS 3.3.2
Function 1 Footnote c	2. Variable Power Level – High	~~4~~	~~2~~(~~a~~) (c)	~~3(f)~~ LA02	1, 2	2	
Function 3 Footnote c	3. Reactor Coolant Flow – Low	~~4/SG~~	~~2~~(~~a~~)~~/SG~~ (c)	~~3/SG~~	1, 2 ~~(e)~~	2	
Function 4	4. Pressurizer Pressure – High	~~4~~	~~2~~	~~3~~	1, 2	2	
Function 5	5. Containment Pressure – High	~~4~~	~~2~~	~~3~~	1, 2	2	
Function 6 Footnote f	6. Steam Generator Pressure – Low	~~4/SG~~	~~2~~(~~b~~)~~/SG~~ (f)	~~3/SG~~	1, 2	2	
Function 7a and b	7. Steam Generator Water Level – Low	~~4/SG~~	~~2/SG~~	~~3/SG~~	1, 2	2	
Function 8 Footnotes g and h	8. Local Power Density – High	~~4~~	~~2~~(~~c~~) (g)	~~3~~	1 (h)	2	L06
Function 9a Footnote c	9. Thermal Margin/Low Pressure	~~4~~	~~2~~(~~a~~) (c)	~~3~~	1, 2 ~~(e)~~	2	
Function 9b Footnote c	9a. Steam Generator Pressure Difference – High	~~4~~	~~2~~(~~a~~) (c)	~~3~~	1, 2 ~~(e)~~	2	
Function 10 Footnotes g and h	10. Loss of ~~Turbine –~~ Load - Turbine Hydraulic Fluid Pressure - Low	~~4~~	~~2~~(~~c~~) (g)	~~3~~	1 (h)	2	L06

Table 3.3.1-1

TABLE 3.3-1 (Continued)

SYSTEM (RPS)

REACTOR PROTECTIVE INSTRUMENTATION

- OPERATING

OR OTHER SPECIFIED CONDITIONS

LA01 LA01 A02

FUNCTION~~AL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM CHANNELS OPERABLE~~	APPLICABLE MODES	ACTION	
11. Wide Range Logarithmic Neutron Flux Monitor						
Function 2 Footnotes d and e — a. ~~Startup and Operating --~~ Power Rate of Change ~~of Power~~ – High	~~4~~	~~2~~(d)	~~3~~	1**, 2 ~~and *~~	2	L01
b. Shutdown	4	0	2	3, 4, 5	3	See ITS 3.3.11
12. Reactor Protection System Logic	4	2	4	1, 2*	4	See ITS 3.3.2
13. Reactor Trip Breakers	4	2	4	1, 2*	4	

Table 3.3.1-1

TABLE 3.3-1 (Continued)

TABLE NOTATION

L01

~~* With the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal.~~

Trip not applicable when Thermal Power is > 15% RTP.

A01

Footnote e ** ~~Mode 1 applicable only when Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER.~~

Footnote c (a) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 1% of RATED THERMAL POWER.

Footnote f (b) Trip may be manually bypassed below 685 psig; bypass shall be automatically removed at or above 685 psig.

is not applicable and

L06

Footnotes g & h (c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is ≥ 15% of RATED THERMAL POWER.

Footnote d (d) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 10^{-4}% and Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER.

~~(e) Deleted.~~

~~(f) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.~~

LA02

h. Trip is only applicable in MODE 1 ≥ 15% RTP.

L06

ACTION STATEMENTS

See ITS 3.3.2

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in HOT STANDBY within the next 6 hours and/or open the protective system trip breakers.

ACTION A

ACTION 2 - ~~With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:~~

Place affected trip unit

a. ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour. ~~For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY; however, the inoperable channel shall then be either restored to OPERABLE status or placed in the tripped condition~~.

One or more Functions with one RPS trip unit or associated instrument channel inoperable except for Condition C (excore channel not calibrated with incore detectors).

AND

Restore channel to Operable status within 48 hours.

OR

Place affected unit in trip within 48 hours.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

A07

~~b. Within one hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.~~

ACTION A

~~c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on than channel provided the other inoperable channel is placed in the tripped condition.~~

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

See ITS 3.3.11

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.1.

See ITS 3.3.2

Add proposed ACTIONS B and C — L02

Add proposed ACTIONS D and E. — L03

Add proposed ACTIONS G and F — A08

~~DELETED~~

A01

Table 3.3.1-1

TABLE 4.3-1
REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTION~~AL UNIT~~	CHANNEL CHECK (SR 3.3.1.1)	CHANNEL CALIBRATION (SR 3.3.1.2, SR 3.3.1.3, SR 3.3.1.5, SR 3.3.1.8) (a)(b)	CHANNEL FUNCTIONAL TEST (SR 3.3.1.4, SR 3.3.1.6, SR 3.3.1.7) (a)(b)	MODES IN WHICH SURVEILLANCE REQUIRED (M01) (M02)	
	1. Manual Reactor Trip	N/A	N.A.	S/U(1)	N/A	See ITS 3.3.2
Function 1	2. Power Level – High (Variable)					
	a. Nuclear Power	SFCP	SFCP(2), SFCP(3), SFCP(5)	SFCP	1,2	
	b. ΔT Power	SFCP	SFCP(4), SFCP	SFCP	1	
Function 3	3. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	
Function 4	4. Pressurizer Pressure – High	SFCP	SFCP	SFCP	1, 2	
Function 5	5. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2	
Function 6	6. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2	
Functions 7a and 7b	7. Steam Generator Water Level – Low	SFCP	SFCP	SFCP~~(6, 7)~~	1, 2	
Function 8	8. Local Power Density – High	SFCP	SFCP	SFCP	1	
Function 9a	9. Thermal Margin/Low Pressure	SFCP	SFCP	SFCP	1, 2	
Function 9b	9a. Steam Generator Pressure Difference – High	SFCP	SFCP	SFCP	1, 2	
Function 10	10. Loss of ~~Turbine –~~ Hydraulic Fluid Pressure – Low (Load - Turbine)	N.A.	M03 ~~N.A.~~ SFCP	S/U(1)	N.A.	
Function 2	11. Wide Range Logarithmic Neutron Flux Monitor (Power Rate of Change - High)	SFCP	M03 ~~N.A.~~ SFCP	S/U(1)	1, 2, 3, 4, 5 ~~and *~~	See ITS 3.3.11
	12. Reactor Protection System Logic	N.A.	N.A.	SFCP and S/U(1)	1, 2 and *	L01 See ITS 3.3.2
	13. Reactor Trip Breakers	N.A.	N.A.	SFCP	1, 2 and *	

TABLE 4.3-1 (Continued)

TABLE NOTATION

~~*~~ - ~~With reactor trip breaker closed.~~ L01

SR 3.3.1.6 (1) - If not performed in previous 7 days.

SR 3.3.1.2 NOTE 1 (2) - Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. ~~Heat balance only, above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometer to null "Nuclear Pwr – ΔT Pwr."~~ M04

SR 3.3.1.2 NOTE 2 During PHYSICS TESTS, these daily calibrations of nuclear power and ΔT power may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

SR 3.3.1.3 and NOTE (3) - Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. ~~Above 15% of RATED THERMAL POWER,~~ recalibrate the excore detectors ~~which monitor the AXIAL SHAPE INDEX by~~ using the incore detectors M05 LA03

Required Action C.2 or restrict THERMAL POWER ~~during subsequent operations~~ to ≤ 90% of the maximum allowed THERMAL POWER level ~~with the existing Reactor Coolant Pump combination~~. A05

SR 3.3.1.2 (4) - Adjust "ΔT Pwr Calibrate" potentiometers to make ΔT power signals agree with calorimetric calculation.

SR 3.3.1.5 NOTE and SR 3.3.1.8 NOTE (5) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

Table 3.3.1-1 Footnote a (6) - If the as-found instrument channel setpoint is ~~either~~ outside its predefined as-found acceptance criteria band ~~or is not conservative with respect to the Allowable Value~~, then the channel shall be ~~declared inoperable and shall be~~ evaluated to verify that it is functioning as required before returning the channel to service. M01

Table 3.3.1-1 Footnote b (7) - ~~The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Field Trip Setpoint, otherwise that channel shall not be returned to OPERABLE status. The Field Trip Setpoint and the methodology used to determine the Field Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in the UFSAR Section 7.2.~~ M02

The instrument channel setpoint shall be reset to a value that is within the as-left acceptance criteria band around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left acceptance criteria bands are specified in the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively.

SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SETPOINTS

LCO 3.3.1

2.2.1 The reactor protective instrumentation setpoints shall be set consistent with the ~~Trip Setpoint~~ Allowable values shown in Table 2.2-1. LA04

APPLICABILITY: AS SHOWN FOR EACH CHANNEL IN TABLE 3.3-1.

ACTION:

ACTION A

With a reactor protective instrumentation setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the ~~Trip Setpoint~~ Allowable value. LA04

ITS 3.3.1

A01

ITS

Table 3.3.1-1

TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

LA04

FUNCTIONAL ~~AL UNIT~~	~~TRIP SETPOINT~~	ALLOWABLE VALUES
~~1. Manual Reactor Trip~~	~~Not Applicable~~	~~Not Applicable~~
Function 1 — 2. Power Level – High (~~1~~ (c)) Variable ~~Four Reactor Coolant Pumps Operating~~	~~≤ 9.61% above THERMAL POWER, with a minimum setpoint of 15% of RATED THERMAL POWER, and a maximum of ≤ 107.0% of RATED THERMAL POWER.~~	≤ 9.61% above THERMAL POWER, and a minimum setpoint of 15% of RATED THERMAL POWER and a maximum of ≤ 107.0% of RATED THERMAL POWER. (A06)
Function 3 — 3. Reactor Coolant Flow – Low (~~1~~ (c)) ~~Four Reactor Coolant Pumps Operating~~	~~≥ 95% of minimum reactor coolant flow with 4 pumps operating *~~	≥ 95% ~~of minimum reactor coolant flow with 4 pumps operating *~~ (LA05) (A06)
Function 4 — 4. Pressurizer Pressure – High	~~≤ 2400 psia~~	≤ 2400 psia
Function 5 — 5. Containment Pressure – High	~~≤ 3.3 psig~~	≤ 3.3 psig
Function 6 — 6. Steam Generator Pressure – Low (~~2~~ (f))	~~≥ 600 psia~~	≥ 600 psia
Functions 7a and 7b — 7. Steam Generator Water Level – Low	~~≥ 35.0% Water Level – each steam generator~~	≥ 35.0% Water Level – each steam generator
Function 8 — 8. Local Power Density – High (~~3~~ (g)(h))	~~Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2.~~	Trip set point adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2. (L06)

~~* For minimum reactor coolant flow with 4 pumps operating, refer to Technical Specification LCO 3.2.5.~~ LA05

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

LA04

	FUNCTION~~AL UNIT~~	~~TRIP SETPOINT~~	ALLOWABLE VALUES
Function 9a	9. Thermal Margin/Low Pressure (~~1~~ (c)) ~~Four Reactor Coolant Pumps Operating~~ A06	~~Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-3 and 2.2-4.~~	Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-3 and 2.2-4 and ≥1887 psia
Function 9b	9a. Steam Generator Pressure Difference High (~~1~~ (c)) (logic in TM/LP)	~~≤ 135 psid~~	≤ 135 psid
Function 10	10. Loss of Turbine – Hydraulic Fluid Pressure – Low (~~3~~ (g)(h))	~~≥ 800 psig~~	≥ 800 psig
Function 2	11. Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change ~~of Power~~ – High (~~4~~ (d))	~~≤ 2.49 decades per minute~~	≤ 2.49 decades per minute

L06 M06

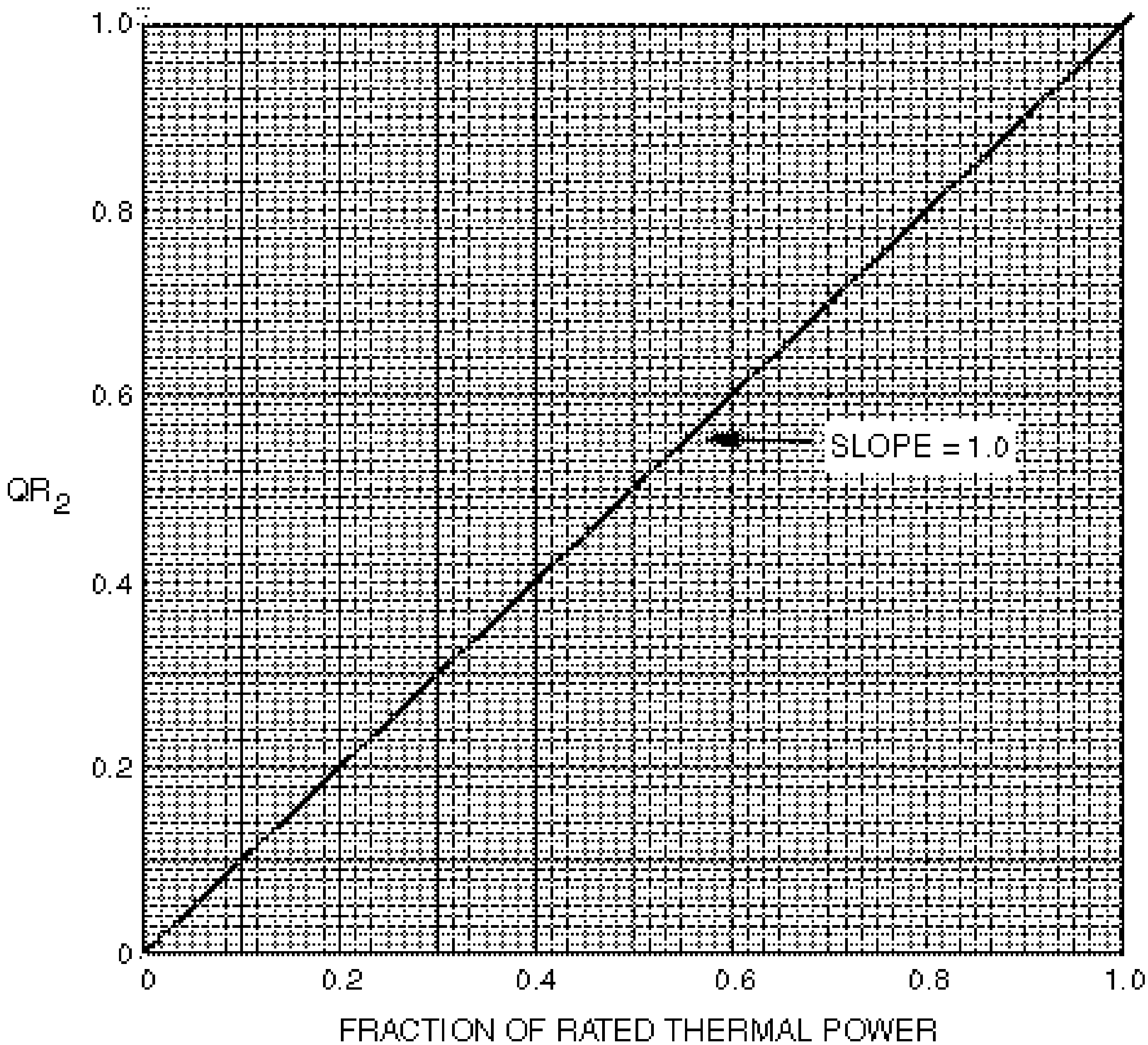
TABLE NOTATION

Footnote c (1) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 1% of RATED THERMAL POWER.

Footnote f (2) Trip may be manually bypassed below 685 psig; bypass shall be automatically removed at or above 685 psig.

Footnote g (3) Trip is not applicable and may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is ≥ 15% of RATED THERMAL POWER. L06

Footnote d (4) Trip may be bypassed below 10^{-4} % and above 15% of RATED THERMAL POWER.

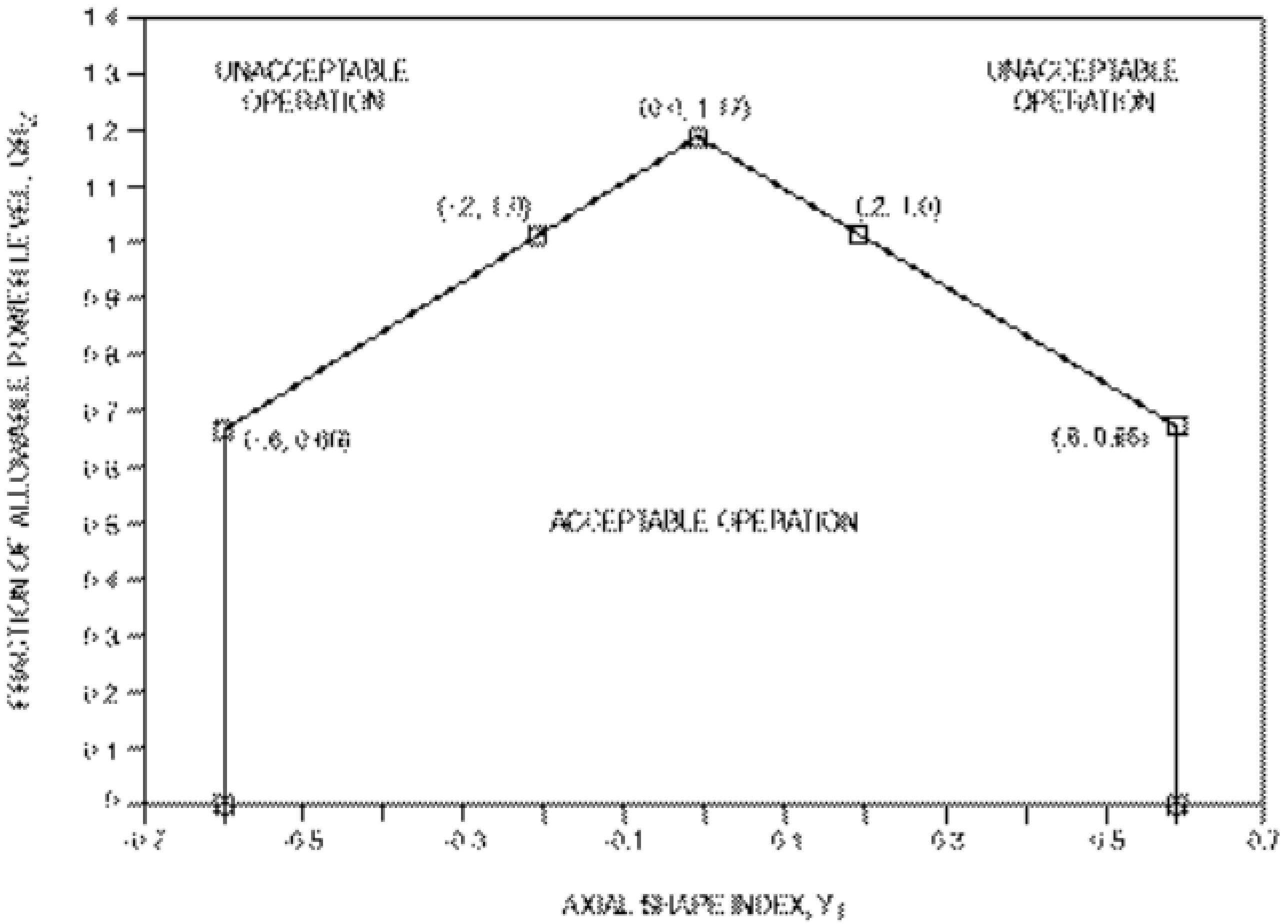


3.3.1-3 (Page 1 of 2)

FIGURE ~~2.2-1~~

Local Power Density – High Trip Setpoint
Part 1 (Fraction of RATED THERMAL POWER Versus QR_2)

Figure 3.3.1-3

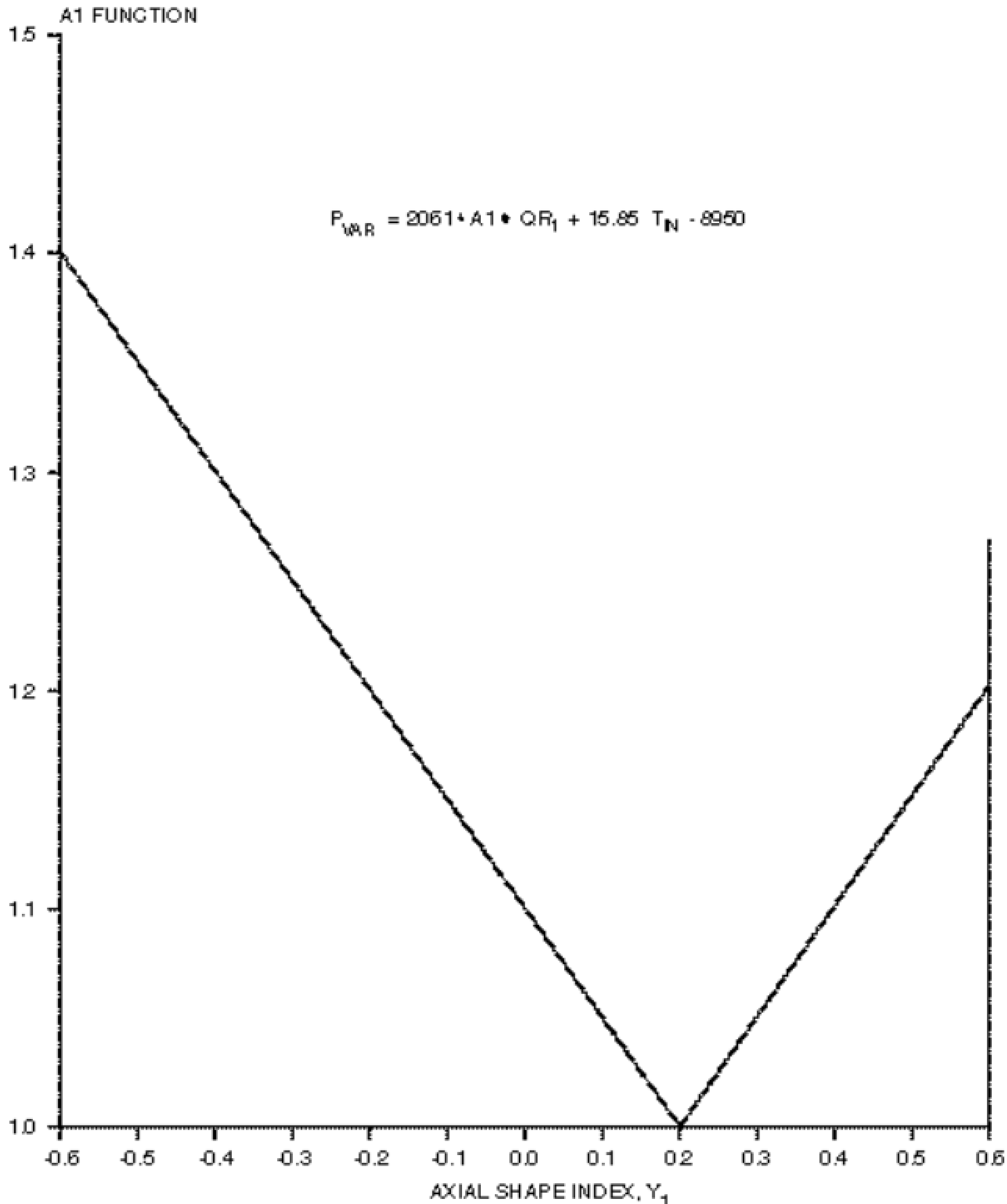


3.3.1-3 (Page 2 of 2)

FIGURE ~~2.2-2~~

Local Power Density – High Trip Setpoint Part 2 (QR_2 Versus Y_1)

Figure 3.3.1-1



3.3.1-1 (Page 1 of 1)

FIGURE ~~2.2-3~~

Thermal Margin/Low Pressure Trip Setpoint

$$P_{VAR} = 2061 * A1 * QR_1 + 15.85\ T_{IN} - 8950$$

Figure 3.3.1-2

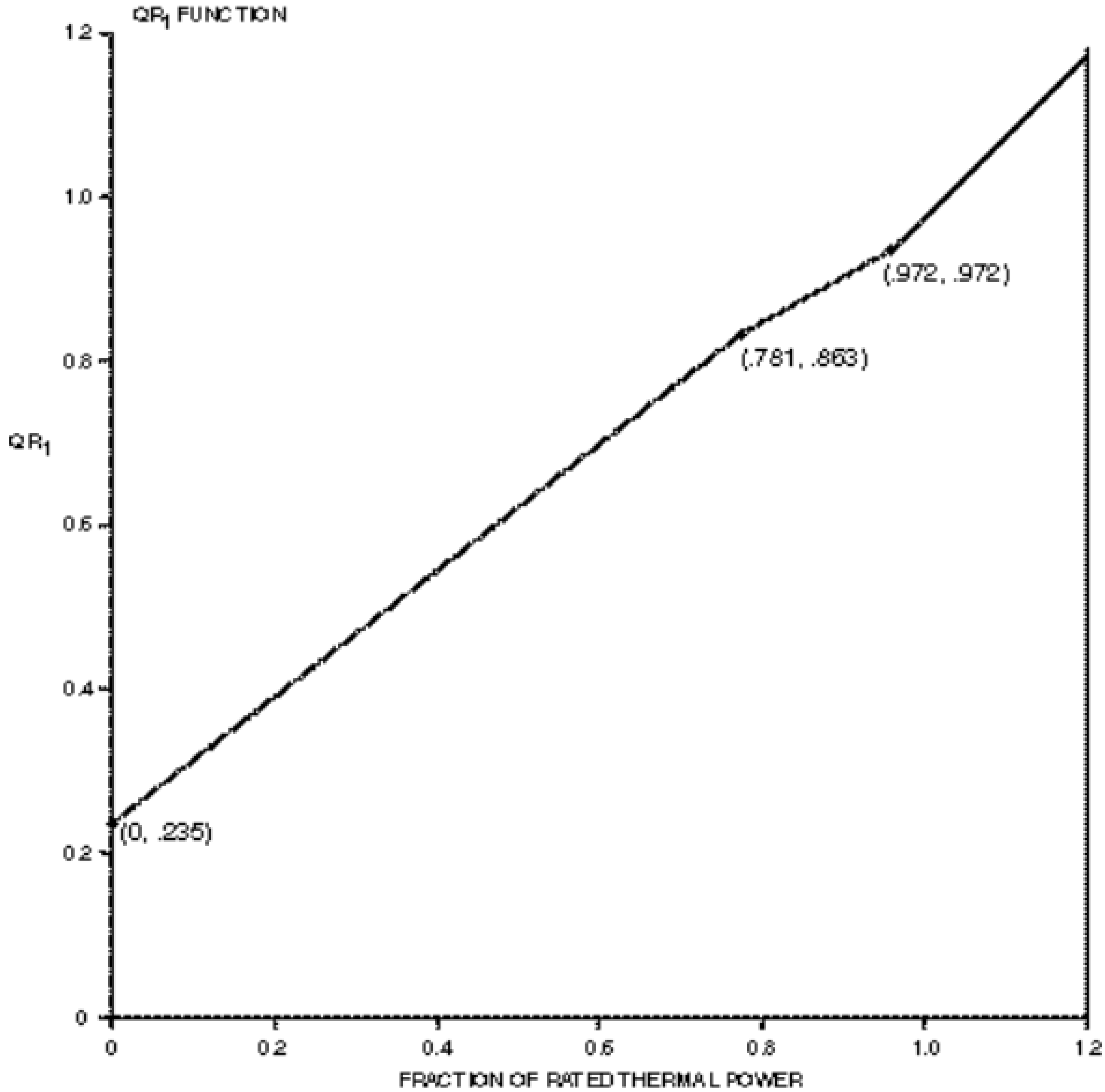


FIGURE ~~2.2-4~~ 3.3.1-2 (Page 1 of 1)

Thermal Margin/Low Pressure Trip Setpoint
Part 2 (Fraction of RATED THERMAL POWER Versus QR_1)

3/4.3 INSTRUMENTATION

SYSTEM (RPS)

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.1 3.3.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE.~~

Four RPS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.1-1

A02

Applicability **APPLICABILITY:** As shown in Table 3.3-1.

Add proposed ACTIONS note.

A03

ACTIONS **ACTION:**

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1
SR 3.3.1.2
SR 3.3.1.3
SR 3.3.1.4
SR 3.3.1.5
SR 3.3.1.6
SR NOTE

4.3.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1.

SR 3.3.1.7

4.3.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

SR 3.3.1.8

SR 3.3.1.9

4.3.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. ~~Each test shall include at least one channel per function.~~

SR 3.3.1.9 NOTE

A04

A01

TABLE 3.3-1

REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION - OPERATING

Table 3.3.1-1

LCO 3.3.1 Applicability

ITS	FUNCTION~~AL UNIT~~	LA01 ~~TOTAL NO. OF CHANNELS~~	LA01 ~~CHANNELS TO TRIP~~	A02 ~~MINIMUM CHANNELS OPERABLE~~	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	ACTION	ITS
	1. Manual Reactor Trip	4 4	2 2	4 4	1, 2 3*, 4*, 5*	1 5	See ITS 3.3.2
Function 1 Footnote c	2. Variable Power Level – High	~~4~~	(c) 2(~~a~~)~~(d)~~ A09	~~3~~	1, 2	2	
Function 4	3. Pressurizer Pressure – High	~~4~~	~~2~~	~~3~~	1, 2	2	
Function 9a Footnote c	4. Thermal Margin/Low Pressure	~~4~~	(c) 2(~~a~~)~~(d)~~ A09	~~3~~	1, 2	2	
Function 5	5. Containment Pressure – High	~~4~~	~~2~~	~~3~~	1, 2	2	
Function 6 Footnote f	6. Steam Generator Pressure – Low	~~4/SG~~	(f) ~~2/SG~~(~~b~~)	~~3/SG~~	1, 2	2	
Function 9b Footnote c	7. Steam Generator Pressure Difference – High	~~4~~	(c) 2(~~a~~)~~(d)~~ A09	~~3~~	1, 2	2	
Function 7a and 7b	8. Steam Generator Level – Low	~~4/SG~~	~~2/SG~~	~~3/SG~~	1, 2	2	
Function 8 Footnote g and h	9. Local Power Density – High	~~4~~	(g) 2(~~c~~)~~(d)~~ A09	~~3~~	1 (h)	2	L06
	~~10. Loss of Component Cooling Water to Reactor Coolant Pumps~~	~~4~~	~~2~~	~~3~~	~~1, 2~~	~~2~~	R01
	11. Reactor Protection System Logic	4	2	~~3~~	1, 2 3*, 4*, 5*	2 5	See ITS 3.3.2
	12. Reactor Trip Breakers	4	2(f)	4	1, 2 3*, 4*, 5*	4 5	
Function 2 Footnotes d and e	13. Wide Range Logarithmic Neutron Flux Monitor a. ~~Startup and Operating -~~ Power Rate of Change ~~of Power~~ – High	~~4~~	2(~~e~~)~~(g)~~ (d) LA02	~~3~~	1**, 2	2	
	b. Shutdown	4	0	2	3, 4, 5	3	See ITS 3.3.11
Function 3 Footnote c	14. Reactor Coolant Flow – Low	~~4/SG~~	(c) ~~2/SG~~(~~a~~)~~(d)~~ A09	~~3/SG~~	1, 2	2	
Function 10 Footnotes g and h	15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	~~4~~	2(~~c~~) (g)	~~3~~	(h) 1	2	L06

Table 3.3.1-1

TABLE 3.3-1 (Continued)

TABLE NOTATION

See ITS 3.3.2

* With the protective system trip breakers in the closed position, the CEA drive system capable of CEA withdrawal, and fuel in the reactor vessel.

Footnote e

** ~~Mode 1 applicable only when Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER.~~ Trip not applicable when Thermal Power is > 15% RTP. A01

Footnote c

(a) Trip may be manually bypassed below 0.5% of RATED THERMAL POWER ~~in conjunction with (d) below~~; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is greater than or equal to 0.5% of RATED THERMAL POWER. A09

Footnote f

(b) Trip may be manually bypassed below 705 psig; bypass shall be automatically removed at or above 705 psig.

Footnotes g & h

(c) Trip is not applicable and may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is greater than or equal to 15% of RATED THERMAL POWER. L06

~~(d) Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.~~ A09

Footnote d

(e) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is $\geq 10^{-4}$% and Power Range Neutron Flux power $\leq$ 15% of RATED THERMAL POWER.

(f) Each channel shall be comprised of two trip breakers; actual trip logic shall be one-out-of-two taken twice.

See ITS 3.3.2

~~(g) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.~~ LA02

h. Trip is only applicable in MODE 1 ≥ 15% RTP. L06

ACTION STATEMENTS

See ITS 3.3.2

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and/or open the protective system trip breakers.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

One or more Functions with one RPS trip unit or associated instrument channel inoperable except for Condition C (excore channel not calibrated with incore detectors).

A10

----------------------NOTE----------------------
Required Action A.2 must be completed whenever this Condition is entered.

ACTION A Required Actions A.1 and A.2

ACTION 2 - a. ~~With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed~~ Place affected trip unit in ~~the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour. ~~The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.~~ Restore channel to OPERABLE status prior to entering MODE 2 following next MODE 5 entry.

A01

ACTION B Required Action B.1

One or more Functions with two RPS trip units or associated instrument channels inoperable except for Condition C (excore channel not calibrated with incore detectors).

b. ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:~~

A01

1. ~~Verify that one of the inoperable channels has been~~ Place one trip unit in bypass~~ed~~ and ~~place~~ the other ~~inoperable channel~~ trip unit in ~~the~~ trip~~ped condition~~ within 1 hour.

~~2. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition.~~

A07

~~With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below:~~

LA06

~~**Process Measurement Circuit**~~	~~**Functional Unit Bypassed**~~
~~1. Safety Channel – Nuclear Instrumentation~~	
~~Wide Range~~	~~Rate of Change of Power – High (RPS)~~
~~Linear Range~~	~~Variable Power Level – High (RPS)~~ ~~Local Power Density – High (RPS)~~ ~~Thermal Margin/Low Pressure (RPS)~~
~~2. Pressurizer Pressure -~~	~~Pressurizer Pressure – High (RPS)~~ ~~Thermal Margin/Low Pressure (RPS)~~ ~~Pressurizer Pressure – Low (ESF)~~
~~3. Containment Pressure -~~	~~Containment Pressure – High (RPS)~~ ~~Containment Pressure – High (ESF)~~
~~4. Steam Generator Pressure -~~	~~Steam Generator Pressure – Low (RPS)~~ ~~Thermal Margin/Low Pressure (RPS)~~ ~~AFAS-1 and AFAS-2 (AFAS)~~ ~~Steam Generator Pressure – Low (ESF)~~
~~5. Steam Generator Level -~~	~~Steam Generator Level – Low (RPS)~~ ~~If SG-2A, then AFAS-1 (AFAS)~~ ~~If SG-2B, then AFAS-2 (AFAS)~~

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

~~ACTION 2 - (Continued)~~

~~6. Cold Leg Temperature~~	~~Variable Power Level – High (RPS)~~ ~~Thermal Margin/Low Pressure (RPS)~~ ~~Local Power Density – High (RPS)~~
~~7. Hot Leg Temperature~~	~~Variable Power Level – High (RPS)~~ ~~Thermal Margin /Low Pressure (RPS)~~ ~~Local Power Density – High (RPS)~~

LA06

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes*. Verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

See ITS 3.3.11

See ITS 3.3.2

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirements, STARTUP and/or POWER OPERATION may continue provided the reactor trip breakers of the inoperable channel are placed in the tripped condition within 1 hour, otherwise, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour, provided the trip breakers of any inoperable channel are in the tripped condition, for surveillance testing per Specification 4.3.1.1.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

See ITS 3.3.11

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* Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

Add proposed ACTION C — L04

Add proposed ACTIONS D and E. — L03

Add proposed ACTIONS F and G — A08

~~DELETED~~

~~DELETED~~

A01

ITS 3.3.1

ITS

TABLE 4.3-1

Table 3.3.1-1

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01

M02

LCO 3.3.1 Applicability

	FUNCTION~~AL UNIT~~	CHANNEL CHECK (SR 3.3.1.1)	CHANNEL CALIBRATION (SR 3.3.1.2, SR 3.3.1.3, SR 3.3.1.5, SR 3.3.1.8) (a)(b)	CHANNEL FUNCTIONAL TEST (SR 3.3.1.4, SR 3.3.1.6, SR 3.3.1.7) (a)(b)	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	1. Manual Reactor Trip	N/A	N.A.	S/U(1)	1, 2, 3*, 4*, 5*	See ITS 3.3.2
Function 1 Footnote c	2. Variable Power Level – High					
	a. Nuclear Power	SFCP	SFCP(2), SFCP(3), SFCP(4)	SFCP	1,2	
	b. ΔT Power	SFCP	SFCP(5), SFCP(4)		1	
Function 4	3. Pressurizer Pressure – High	SFCP	SFCP	SFCP	1, 2	
Function 9a Footnote c	4. Thermal Margin/Low Pressure	SFCP	SFCP	SFCP	1, 2	
Function 5	5. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2	
Function 6 Footnote f	6. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2	
Function 9b Footnote c	7. Steam Generator Pressure Difference – High	SFCP	SFCP	SFCP	1, 2	
Functions 7a and b	8. Steam Generator Level – Low	SFCP	SFCP	SFCP~~(8, 9)~~	1, 2	
Function 8 Footnote g & h	9. Local Power Density – High	SFCP	SFCP	SFCP	1	
	~~10. Loss of Component Cooling Water to Reactor Coolant Pumps~~	~~N.A.~~	~~N.A.~~	~~SFCP~~	~~N.A.~~	R01
	11. Reactor Protection System Logic	N.A.	N.A.	SFCP(7)	1, 2, 3*, 4*, 5*	See ITS 3.3.2

ITS

A01

ITS 3.3.1

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTION~~AL UNIT~~	SR 3.3.1.1 CHANNEL CHECK	SR 3.3.1.2, SR 3.3.1.3, SR 3.3.1.5, SR 3.3.1.8 (a)(b) CHANNEL CALIBRATION	SR 3.3.1.4, SR 3.3.1.6, SR 3.3.1.7 CHANNEL FUNCTIONAL TEST (a)(b)	M01 MODES FOR WHICH SURVEILLANCE IS REQUIRED	M02
	12. Reactor Trip Breakers	N.A.	N.A.	S/U(1), SFCP, SFCP(6)	1, 2, 3*, 4*, 5*	See ITS 3.3.2
Function 2	13. Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change - High	SFCP	SFCP	S/U(1),SFCP	1, 2, 3, 4, 5	See ITS
Function 3	14. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	
Function 10	15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	SFCP	SFCP ~~N.A.~~ M03	SFCP	1	

Add proposed Note to SR 3.3.1.8

L05

TABLE 4.3-1 (Continued)

TABLE NOTATION

* - Only if the reactor trip breakers are in the closed position and the CEA drive system is capable of CEA withdrawal.

See ITS 3.3.2

SR 3.3.1.6 (1) - Each startup ~~or when required with the reactor trip breakers closed and the CEA drive system capable of rod withdrawal,~~ if not performed in the previous 7 days.

Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP.

M04

SR 3.3.1.2 NOTE 1 (2) - ~~Heat balance only (CHANNEL FUNCTIONAL TEST not included), above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometer to null "Nuclear Power – ΔT Power".~~ During PHYSICS TESTS, these daily calibrations may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

SR 3.3.1.2 NOTE 2

Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP.

M05

SR 3.3.1.3 and NOTE (3) - ~~Above 15% of RATED THERMAL POWER,~~ recalibrate the excore detectors ~~which monitor the AXIAL SHAPE INDEX~~ by using the incore detectors or restrict THERMAL POWER ~~during subsequent operations~~ to ≤ 90% of the maximum allowed THERMAL POWER level ~~with the existing reactor coolant pump combination~~.

ACTION C.2

A05

SR 3.3.1.5 NOTE and SR 3.3.1.8 NOTE (4) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

SR 3.3.1.2 (5) - Adjust "ΔT Pwr Calibrate" potentiometers to make ΔT power signals agree with calorimetric calculation.

See ITS 3.3.2

(6) - In accordance with the Surveillance Frequency Control Program and following maintenance or adjustment of the reactor trip breakers, the CHANNEL FUNCTIONAL TEST shall include verification of the independent OPERABILITY of the undervoltage and shunt trips.

(7) - The fuse circuitry in the matrix fault protection circuitry shall be determined to be OPERABLE by testing with the installed test circuitry.

instrument

Table 3.3.1-1 Footnote a (8) - If the as-found channel setpoint is ~~either~~ outside its predefined as-found acceptance criteria band ~~or is not conservative with respect to the Allowable Value~~, then the channel shall be ~~declared inoperable and shall be~~ evaluated to verify that it is functioning as required before returning the channel to service.

M01

Table 3.3.1-1 Footnote b (9) - ~~The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Field Trip Setpoint, otherwise that channel shall not be returned to OPERABLE status. The Field Trip Setpoint and the methodology used to determine the Field Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in UFSAR Section 7.2.~~

M02

The instrument channel setpoint shall be reset to a value that is within the as-left acceptance criteria band around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left acceptance criteria bands are specified in the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively.

SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SETPOINTS

LCO 3.3.1

2.2.1 The reactor protective instrumentation setpoints shall be set consistent with the ~~Trip Setpoint~~ Allowable values shown in Table 2.2-1. LA04

Applicability

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

ACTION A

With a reactor protective instrumentation setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the ~~Trip Setpoint~~ Allowable value. LA04

A01

Table 3.3.1-1

TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

LA04

ITS	FUNCTION~~AL UNIT~~	~~TRIP SETPOINT~~	ALLOWABLE VALUES	
	~~1. Manual Reactor Trip~~	~~Not Applicable~~	~~Not Applicable~~	
Function 1	2. Variable Power Level – High(~~1~~)(c)			
	~~Four Reactor Coolant Pumps Operating~~	~~≤ 9.61% above THERMAL POWER, with a minimum setpoint of 15% of RATED THERMAL POWER, and a maximum of ≤ 107.0% of RATED THERMAL POWER.~~	≤ 9.61% above THERMAL POWER, and a minimum setpoint of 15% of RATED THERMAL POWER and a maximum of ≤ 107.0% of RATED THERMAL POWER.	A06
Function 4	3. Pressurizer Pressure – High	~~≤ 2370 psia~~	≤ 2374 psia	
Function 9a	4. Thermal Margin/Low Pressure(~~1~~)(c)			
	~~Four Reactor Coolant Pumps Operating~~	~~Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-3 and 2.2-4. Minimum value of 1900 psia.~~	Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-3 and 2.2-4. Minimum value of 1900 psia.	A06
Function 5	5. Containment Pressure – High	~~≤ 3.0 psig~~	≤ 3.1 psig	
Function 6	6. Steam Generator Pressure – Low	~~≥ 626.0 psia~~(~~2~~)	≥ 621.0 psia(~~2~~)(f)	
Function 9b	7. Steam Generator Pressure(~~1~~)(c) Difference – High (Logic in TM/LP Trip Unit)	~~≤ 120.0 psid~~	≤ 132.0 psid	
Functions 7a and 7b	8. Steam Generator Level – Low	~~≥ 35.0%(3)~~	≥ 35.0%(~~3~~)	LA07

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

LA04

FUNCTION~~AL UNIT~~	~~TRIP SETPOINT~~	ALLOWABLE VALUES	
Function 8 9. Local Power Density – High(~~5~~)(g)(h) Operating	~~Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2~~	Trip setpoint adjusted to not exceed the limit lines of Figures 2.2-1 and 2.2-2.	L06
~~10. Loss of Component Cooling Water to Reactor Coolant Pumps – Low~~	~~≥ 636 gpm**~~	~~≥ 636 gpm~~	R01
~~11. Reactor Protection System Logic~~	~~Not Applicable~~	~~Not Applicable~~	
~~12. Reactor Trip Breakers~~	~~Not Applicable~~	~~Not Applicable~~	
Function 2 13. Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change of Power – High(~~4~~)(d)	~~≤ 2.49 decades per minute~~	≤ 2.49 decades per minute	
Function 3 14. Reactor Coolant Flow – Low(~~1~~)(c)	~~≥ 95.4% of minimum Reactor Coolant flow with four pumps operating*~~	≥ 94.9% ~~of minimum Reactor Coolant flow with four pumps operating*~~	LA05
Function 10 15. Loss of Load (Turbine) Hydraulic Fluid Pressure – Low(~~5~~)(g)(h)	~~≥ 800 psig~~	≥ 800 psig	L06

~~* For minimum reactor coolant flow with four pumps operating, refer to Technical Specification LCO 3.2.5.~~ LA05

~~** 10-minute time delay after relay actuation.~~ LA04

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATION

A09

Footnote c (1) Trip may be manually bypassed below 0.5% of RATED THERMAL POWER ~~during testing pursuant to Special Test Exception 3.10.3~~; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is greater than or equal to 0.5% of RATED THERMAL POWER.

Footnote f (2) Trip may be manually bypassed below 705 psig; bypass shall be automatically removed at or above 705 psig.

~~(3) % of the narrow range steam generator level indication.~~

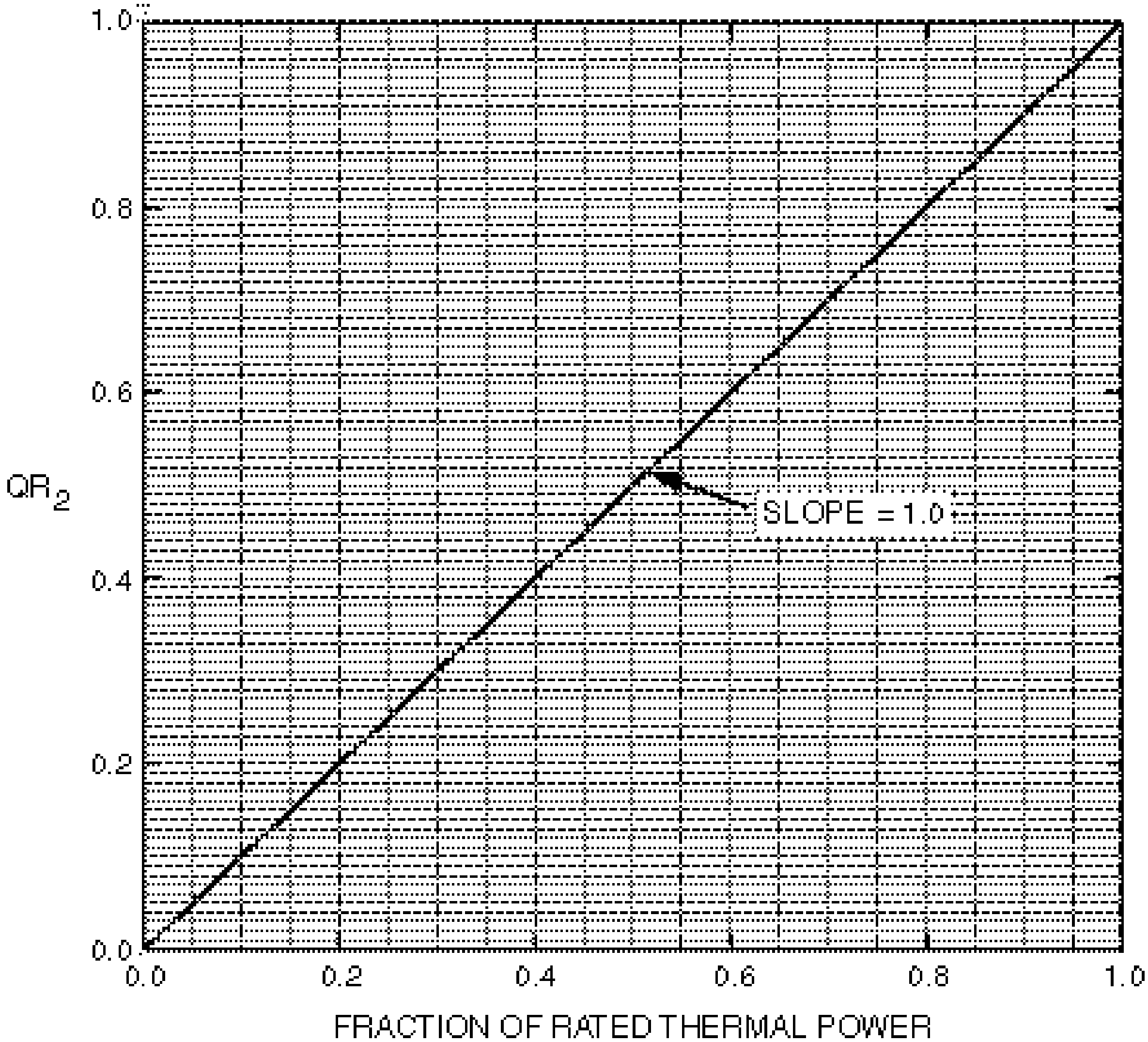
LA07

Footnote d (4) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 10^{-4}% and Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER.

is not applicable and

L06

Footnotes g and h (5) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is greater than or equal to 15% of RATED THERMAL POWER.



3.3.1-3 (Page 1 of 2)

FIGURE ~~2.2-1~~

Local power density – High trip setpoint
Part 1 (Fraction of RATED THERMAL POWER versus QR_2)

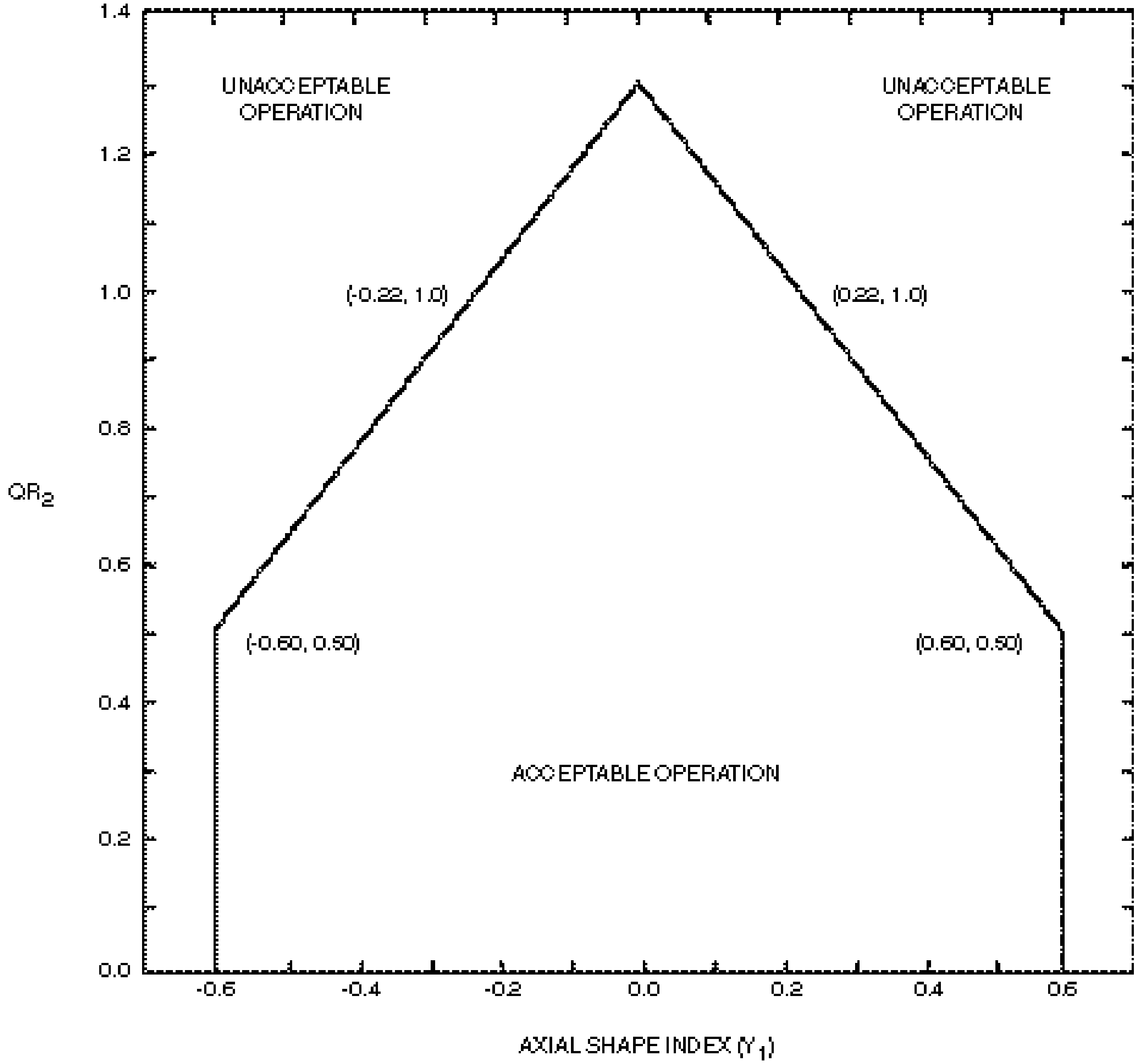
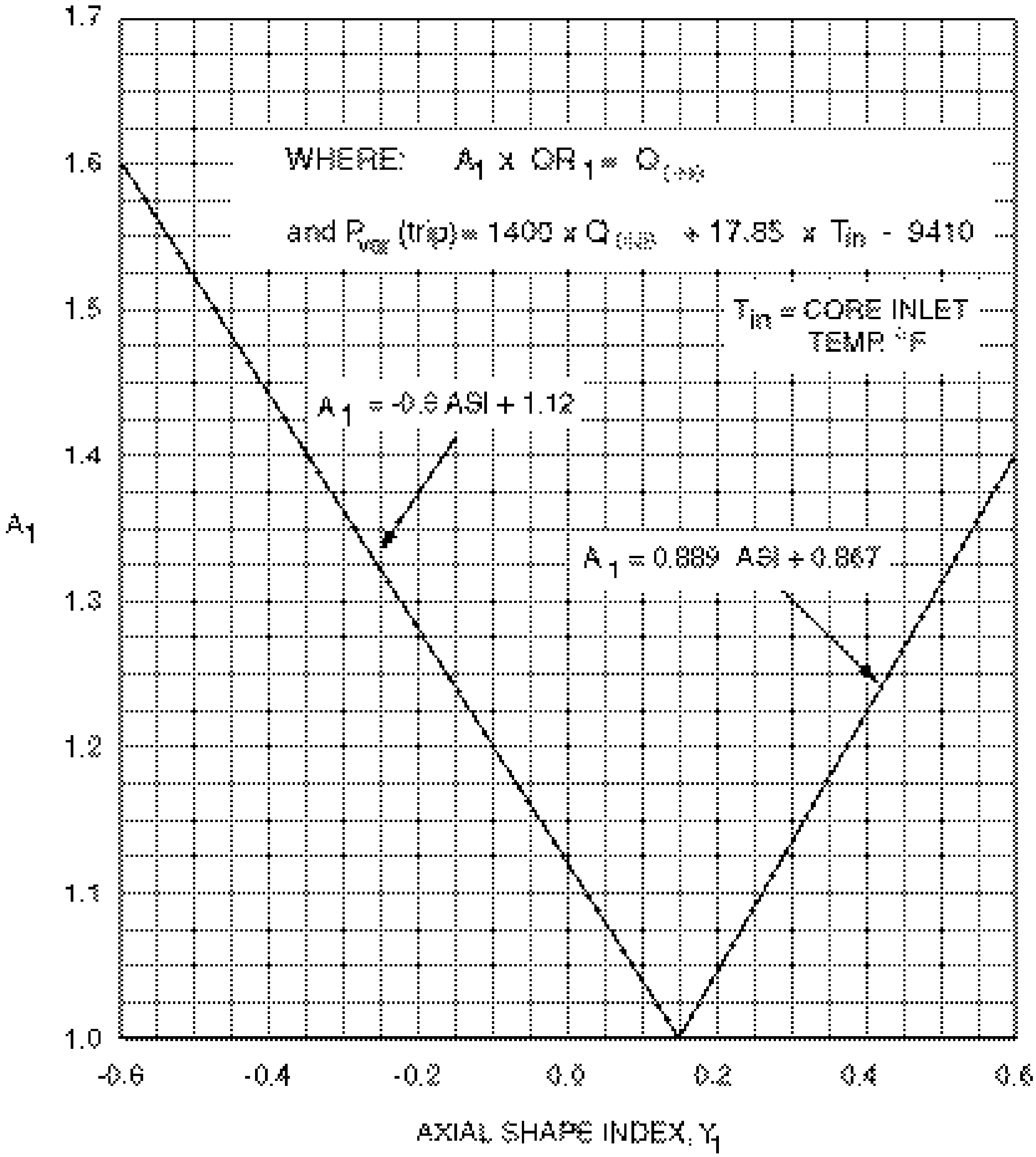


FIGURE ~~2.2-2~~ 3.3.1-3 (Page 2 of 2)

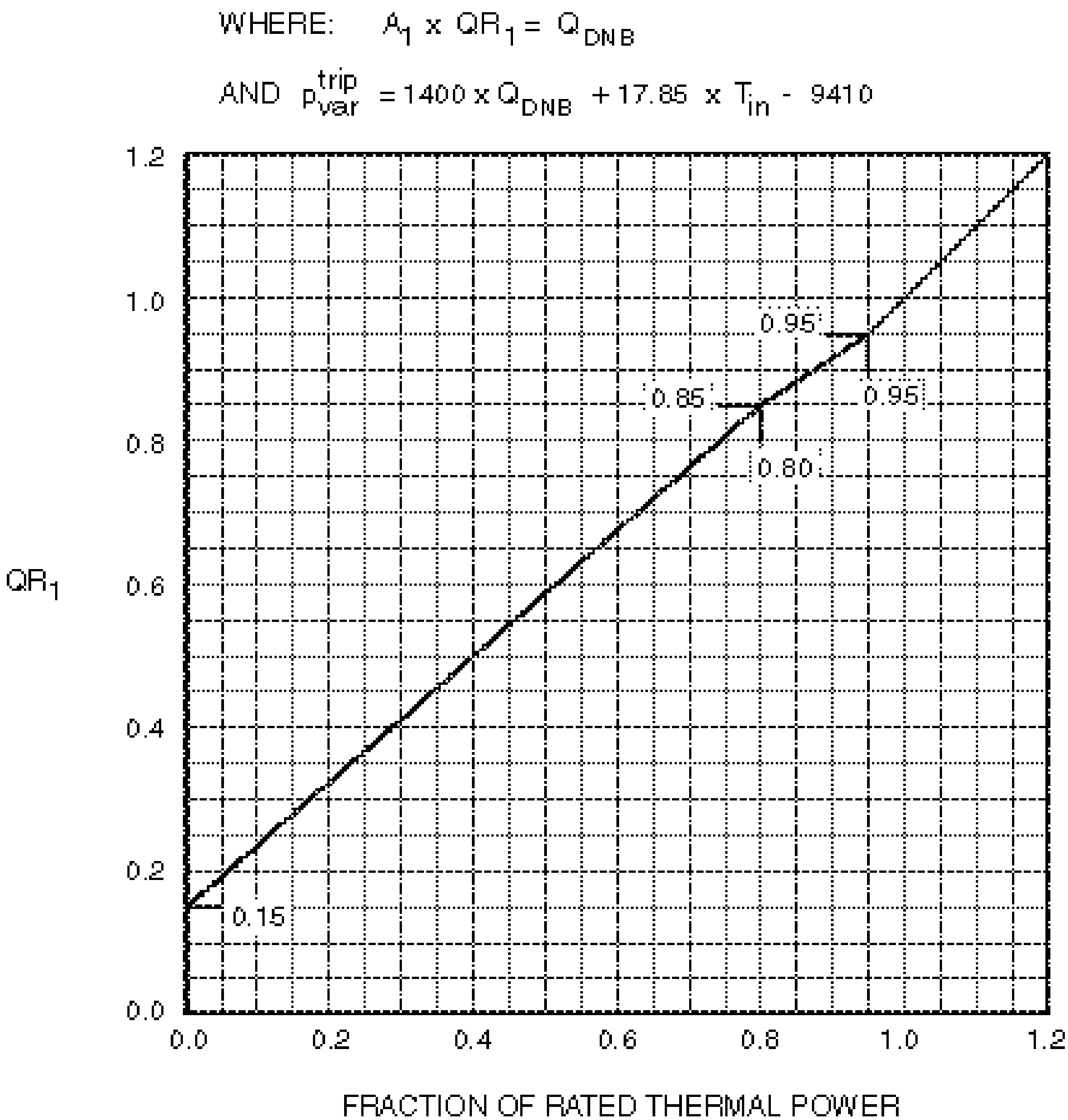
LOCAL POWER DENSITY – HIGH TRIP SETPOINT PART 2
(QR_2 versus Y_1)



3.3.1-1 (Page 1 of 1)

FIGURE ~~2.2-3~~

THERMAL MARGIN/LOW PRESSURE TRIP SETPOINT
PART 1 (Y_1 Versus A_1)



3.3.1-2 (Page 1 of 1)

FIGURE ~~2.2-4~~

THERMAL MARGIN/LOW PRESSURE TRIP SETPOINT

PART 2 (FRACTION OF RATED THERMAL POWER VERSUS QR_1)

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS Table 3.3-1 specifies the "TOTAL NO. OF CHANNELS" and the "MINIMUM CHANNELS OPERABLE" associated with each RPS Functional Unit. For Unit 1 CTS Table 3.3-1 Functional Units 2, 3, 4, 7, 8, 9, 9a, and 11a and for Unit 2 Functional Units 2 through 10, 13a, 14 and 15; the number of channels listed in the "TOTAL NO. OF CHANNELS" column is greater than that listed in the "MINIMUM OPERABLE CHANNELS" column. CTS Table 3.3-1 Action 2 specifies the actions to take with the number of channels OPERABLE one less than required by the "TOTAL NO. OF CHANNELS" column. ITS LCO 3.3.1 requires “Four RPS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.” The ITS 3.3.1 ACTIONS require entry when the OPERABLE channels are one less than required by the LCO statement. This changes the CTS by deleting the "MINIMUM CHANNELS OPERABLE" column and utilizing the channel requirements specified in the TOTAL NO. OF CHANNELS column in ITS LCO 3.3.1.

This change is acceptable because the requirements for when actions must be taken remain unchanged. The ITS LCO statement reflects the current requirements in the CTS Actions for when actions are required to be taken. The "MINIMUM CHANNELS OPERABLE" column for CTS Table 3.3-1 has been removed and the "TOTAL NO. OF CHANNELS" column numbers are reflected in ITS LCO 3.3.1. This change is a presentation preference consistent with NUREG-1432, Rev. 5 and PSL CTS Table 3.3-1 Functional Unit Total No. of Channels to Trip column. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 Unit 1 CTS 3.3.1.1 ACTION, Unit 2 CTS 3.3.1 ACTION and CTS Table 3.3-1 provide the compensatory actions to take when RPS instrumentation is inoperable. ITS 3.3.1 ACTIONS provide the compensatory actions for inoperable RPS Instrumentation. The ITS 3.3.1 ACTIONS includes a Note that allows separate Condition entry for each Function. This modifies the CTS by providing a specific allowance to enter the Action for each inoperable RPS instrumentation Function and for certain Functions on a steam generator basis.

The purpose of the CTS Actions is to provide the appropriate compensatory actions for inoperable RPS Functions. This proposed change will allow separate condition entry for each RPS instrumentation Function. This change is acceptable because it clearly states the current requirement. The CTS considers each RPS instrumentation Function to be separate and independent from the others. In addition, the channels associated with Functions 3 and 6 are allowed separate Condition entry on the specified basis (i.e., per SG) since the channels associated with each steam generator will provide the associated RPS trip based on the logic associated with the channels on the specified basis. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 Unit 1 CTS 4.3.1.1.3 and Unit 2 CTS 4.3.1.3 state, in part, that the RPS RESPONSE TIME test of each reactor trip function "shall include at least one channel per function." ITS SR 3.3.1.9 requires performance of an RPS RESPONSE TIME test but does not explicitly state that the RPS RESPONSE TIME test must include at least one channel per function.

The purpose of the CTS statement in the Surveillance Requirement associated with the RPS RESPONSE TIME test is to ensure required features are tested to verify the RPS instrument Functions are OPERABLE. However, this statement is redundant to the definition of RPS RESPONSE TIME provided in ITS Section 1.1 and therefore is not necessary.

The definition of the RPS RESPONSE TIME states, in part, that the test, "…shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. This encompasses the requirement that at least one channel per Function be included in the RPS RESPONSE TIME. The required testing will continue, per the ITS SR wording and the definition provided in Section 1.1, to include the features necessary to verify the RPS instrument Functions are OPERABLE.

This change is designated as administrative because it does not result in technical changes to the CTS.

A05 CTS Table 4.3-1 footnote 3 states, in part, "with the existing Reactor Coolant Pump combination." ITS SR 3.3.1.3 and Required Action C.2 do not include this specific detail. This changes CTS by removing redundant detail. This change is acceptable because reactor coolant pump (RCP) OPERABILITY and required operation is addressed in other Specifications in CTS and retained in ITS 3.4.1 and 3.4.4. LCO 3.4.1 and LCO 3.4.4 require, in part, a minimum reactor coolant flow and both Reactor Coolant System (RCS) loops to be in operation, respectively (i.e., all four RCPs are in operation) in MODES 1 and 2. The "existing Reactor Coolant Pump combination" is determined by compliance with these LCOs and retention of the information in ITS SR 3.3.1.3 is unnecessary.

This change is acceptable because the requirements for RCP operation remain unchanged and are retained in ITS 3.4.1 and 3.4.4. This change is designated as administrative because it does not result in a technical change to CTS.

A06 CTS Table 2.2-1 Functional Units 2, 3 and 9 (Unit 1) and Functional Units 2 and 4 (Unit 2) specify "Four Reactor Coolant Pumps Operating". The equivalent RPS Functions in ITS Table 3.3.1-1 Functions 1, 3, and 9a do not include this detail. Requirements for reactor coolant pump OPERABILITY and required operation are provided in CTS 3.4.1.1. LCO 3.4.1 and LCO 3.4.4 require, in part, a minimum reactor coolant flow and both Reactor Coolant System (RCS) loops to be in operation, respectively (i.e., all four RCPs are in operation) in MODES 1 and 2. This changes the CTS by removing the "Four Reactor Coolant Pumps Operating" redundant detail from the RPS specification.

This change is acceptable because the requirements for reactor coolant pump operation remain unchanged. This change is designated as administrative because it does not result in a technical change to CTS.

A07 Unit 1 CTS Table 3.3-1, Action 2.b and Unit 2 CTS Table 3.3-1, Action 2.b.2 state, in part, that all functional units receiving an input from (or affected by) the inoperable channel are (shall be) also bypassed or tripped. ITS 3.3.1 ACTIONS for each Function include a Required Action to place the affected trip unit in trip or bypass within 1 hour. CTS LCO 3.0.2 and ITS LCO 3.0.2 establish that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. Therefore, when an instrument channel becomes inoperable, LCO 3.0.2 requires each Function affected by the inoperability shall be declared inoperable and the associated ACTIONS shall be met. Retention of these specific CTS Actions are not necessary and are deleted. This change is designated as administrative because it does not result in a technical change to the CTS.

A08 Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 do not contain a default action to perform when the Table 3.3-1 Actions cannot be completed within the required time; therefore, an entry into CTS 3.0.3 would be required. ITS 3.3.1 ACTION F requires reducing THERMAL POWER to < 15% RTP in 6 hours when Required Action and associated Completion Time for Loss of Power Density and Loss of Load Trip Functions are not met. ITS 3.3.1 ACTION G requires the unit to be in MODE 3 in 6 hours and MODE 4 in 12 hours when Required Action and associated Completion Time for RPS Functions other than the Loss of Power Density and Loss of Load Trip Functions are not met. (See DOC L06 for discussion of modification to Applicability) This changes the CTS by explicitly stating shutdown ACTIONS when actions cannot be performed within the required time.

The purpose of ITS 3.3.1 ACTIONS F and G is to ensure the plant is brought to a MODE in which the LCO for the RPS Functions does not apply within a reasonable amount of time in a controlled manner because the Technical Specification actions cannot be completed as required. Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 are silent on these actions, deferring to CTS 3.0.3 for the actions to accomplish this. With the exception of the Loss of Power Density and Loss of Load Trip Functions, the RPS Functions are required to be OPERABLE in MODES 1 and 2. The Loss of Power Density and Loss of Load Trip Functions are required to be OPERABLE with THERMAL POWER ≥ 15% RTP per ITS Table 3.3.1-1 Footnote (h) (CTS Table 3.3-1 Note (c)). The proposed change is acceptable because the ACTIONS specified in ITS 3.3.1 adopt the ISTS structure for placing the unit outside the MODE of Applicability without changing the time to be below 15% RTP for the Loss of Power Density and Loss of Load Trip Functions and the time specified to enter MODE 3 for the other RPS Functions. Default Conditions eliminate the need to enter LCO 3.0.3 when one or more Required Actions cannot be met within the associated Completion

Times. This change is designated as administrative because it does not result in a technical change to the CTS.

A09 **Unit 2 only:** Current Technical Specifications (CTS) 3/4.10.3 provides an exception to the limitations of CTS 3.4.1 and the requirements of CTS Tables 2.2-1 and 3.3-1. This special test exception permits reactor criticality under reduced flow conditions and is required to perform certain startup and PHYSICS TESTS while at low THERMAL POWER levels. ITS does not contain this special test exception. This changes the CTS by eliminating a special test exception discussion from the footnotes.

This change is acceptable because this type of PHYSICS TEST is no longer performed. As a result, this CTS Special test exception is not needed and the references to the test are removed. This change is designated as administrative because it does not result in a technical change to the CTS and is consistent with the changes addressed in CTS 3/4.10.3.

A10 **Unit 2 only:** CTS 3.3.1 Table 3.3-1 Action 2a provides actions when one channel associated with the RPS Functional Units (except 1, 11, 12, and 13.b) is inoperable. The CTS Action states in part, "The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN." ITS 3.3.1 ACTION A includes this action to restore the channel to OPERABLE with a Completion Time of, "Prior to entering MODE 2 following the next MODE 5 entry." This presentation preference is similar to the Completion Time specified in ISTS 3.3.1 (Digital), Required Action A.2. ITS 3.3.1, Condition A is modified by a Note which requires the action to restore the channel to OPERABLE status within the Completion Time to be performed whenever the Condition is entered. This changes the CTS by explicitly stating that the Required Action must be performed within the Completion Time whenever the condition is entered.

This change is necessary to eliminate the conflict with the general CTS 3.0.2 (ITS LCO 3.0.2) requirement that if the LCO is met or is no longer applicable prior to expiration of the specified time interval(s), completion of the ACTIONS is not required, unless otherwise stated. The addition of the Note constitutes an "unless otherwise stated." The Note will require the action to be completed within the Completion Time even when the LCO is no longer applicable, to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions. This change is acceptable because it reflects the current understanding and application of the CTS Action requiring the applicable channel to be restored to OPERABLE status whenever the LCO is not met.

This change is designated as administrative as it clarifies the current understanding of the CTS requirement while providing an "unless otherwise stated," to the requirements of CTS 3.0.2 (ITS LCO 3.0.2).

<u>MORE RESTRICTIVE CHANGES</u>

M01 CTS 2.2.1 ACTION states, in part, that with a RPS instrumentation or interlock setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable. ITS Table 3.3.1-1 Footnote (a) states, "If the as-found channel setpoint is outside its predefined as-found acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service." ITS Bases Section 3.3.1, referring to the Allowable Values, states: "This value is specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value." ITS Section 3.3.1 Bases also states, "If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found acceptance criteria band (e.g., conservative side of the as-found acceptance criteria band), the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the NTSP (within the allowed acceptance criteria band) and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance." CTS Table 4.3-1 Note (8) is similar to the proposed footnote but applies to only the Steam Generator Level – Low RPS Function. This changes the CTS by requiring an evaluation of channel functionality (extent of which is expanded on in the TS Bases) prior to returning it to service in addition to the as-found value being conservative to the Allowable Value and applies to all the RPS Function channels.

The purpose of this Note is to address a concern that the Technical Specification requirements for Limiting Safety System Settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. This change is consistent with the ISTS. This change is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

M02 CTS 2.2.1 ACTION states, in part, to declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1.1 (Unit 1) and 3.3.1 (Unit 2) until the channel is restored to OPERABLE status "with its trip setpoint adjusted consistent with the Trip Setpoint value." ITS Table 3.3.1-1 Footnote (b) states, "The instrument channel setpoint shall be reset to a value that is within the as-left acceptance criteria band around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left acceptance criteria bands are specified in the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively." CTS Table 4.3-1 Note (9) is similar to the proposed footnote but applies to only the Steam Generator Level – Low RPS Function. This changes the CTS by providing more detailed information describing what "consistent with the Trip Setpoint" means and states a specific location where the NTSPs and the methodology for determining the double-sided NTSP instrument tolerance bands are located. This additional footnote applies to all the RPS Function channels.

The purpose of this Note is to address a concern that the Technical Specification requirements for LSSS may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will always actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. This change is consistent with the ISTS. This change is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

M03 CTS Table 4.3-1 Functional Unit 10 (Unit 1) and Functional Unit 15 (Unit 2) Loss of Load channels and Unit 1 Functional Unit 11 Wide Range Logarithmic Neutron Flux Monitor channels do not require Channel Calibration. ITS SR 3.3.1.8 requires Channel Calibration of each appliable RPS instrument channel including bypass removal functions with a periodic surveillance frequency in accordance with the Surveillance Frequency Control Program (SFCP). A note to the SR excludes neutron flux detectors from the Channel Calibration. This changes the CTS by adding an additional surveillance requirement for the Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change – High (ITS Table 3.3.1-1 Function 2) and the Loss of Load (ITS Table 3.3.1-1 Function 10 (Unit 1) and Function 15 (Unit 2)) RPS Functions.

The proposed change is acceptable because it provides additional assurance that the Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change -

High and Loss of Load RPS Functions are functioning properly. This change is consistent with ISTS.

PSL controls periodic Frequencies for Surveillances in accordance with the SFCP per CTS 6.8.4.o (Unit 1) and CTS 6.8.4.q (Unit 2). Therefore, the initial Frequency in accordance with the Surveillance Frequency Control Program will be specified as 18 months consistent with ISTS 3.3.1.8. The periodic Frequency is acceptable based upon the assumption of a 22.5 month calibration interval (18 months plus 25% grace) for the determination of the magnitude of equipment drift and is consistent with the CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST Frequencies for the PSL Unit 2 wide range neutron monitoring instrumentation.

The SFCP was established as described in FPL (PSL Unit 1 and Unit 2) "Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program" (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066).

The proposed change is designated more restrictive because it includes additional requirements that are not specified in the CTS.

M04 The CTS channel calibration surveillance assigned to the power range neutron flux high setpoint on Table 4.3-1 consists of adjusting the power range instrument channels to match the calorimetric heat balance calculation. The CTS surveillance is modified by Note (2) that states the surveillance is only required above 15% RTP without specifying a time for first calibration during power escalation. ITS SR 3.3.1.2 is modified by a Note that states the surveillance is not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. The CTS is revised to be consistent with the ISTS. This changes the CTS by adding more specific requirements for the performance of the adjustment of the power range channels to the results of the calorimetric heat balance calculation.

The proposed change provides additional guidance for performing the power range instrumentation surveillance. The ISTS note establishes 12 hours for performing the first adjustment of the power range channels during power escalation. The proposed change is acceptable because it provides additional assurance that the power range instrument adjustments are accomplished in a timely and controlled manner such that the accuracy of the power range instrumentation is maintained within acceptable limits relative to the applicable safety analysis assumptions. As such, the proposed change enhances the assurance provided by the TS that the affected plant equipment is maintained OPERABLE and that the plant continues to be operated in a safe manner. The proposed change is designated more restrictive because it includes a specific additional requirement that is not specified in the CTS.

M05 The CTS channel calibration requirement associated with the power range neutron flux high setpoint on Table 4.3-1 is modified by Note (3). CTS Table 4.3-1 Note (3) specifies that the surveillance recalibrate the excore detectors using the incore detectors above 15% RTP without specifying a first performance time. ITS SR 3.3.1.3 is modified by a Note that states the surveillance is not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. The CTS is revised to conform to the proposed ISTS surveillance requirement. This changes the CTS by placing a new time restriction on the first performance of the surveillance after exceeding the specified power.

The first performance of this surveillance after a shutdown or refueling outage is important to establish the instrument accuracy is within acceptable tolerances. The proposed change is acceptable because it provides assurance that the surveillance is completed in a timely manner and that the instrument accuracy is verified within acceptable limits shortly after a plant startup. As such, the proposed change enhances the assurance provided by the TS that the instrument is maintained operable and that the plant continues to be operated in a safe manner. The proposed change is designated more restrictive because it includes additional requirements that are not specified in the CTS.

M06 **Unit 1 only:** CTS Table 2.2-1 Functional Unit 9 does not include a minimum allowable value for the reactor coolant pressure (RCS). The thermal margin/low pressure trip allowable value is determined based on a RCS minimum pressure or a computed value that is a function of the higher ΔT power or neutron power, reactor inlet temperature, the number of coolant pumps operating and the AXIAL SHAPE INDEX. The proposed ITS 3.3.1 Function 9a adds the minimum pressure value of 1887 psia to the allowable values determined by ITS Figures 3.3.1-1 and 3.3.1-2. This changes the CTS Table 2.2-1 Functional Unit 9 allowable value by adding a minimum pressure value.

The purpose of the thermal margin/low pressure trip is to protect against the occurrence of DNB during steady state operation. This change is acceptable because the RCS pressure (pressurizer pressure) minimum value is an assumption considered in the accident analysis. In addition, the addition of the allowable value is consistent with the PSL Unit 2 thermal margin/low pressure trip allowable value. This changes CTS by adding an allowable value requirement not currently required in CTS. The proposed change is designated more restrictive because it includes additional requirements that are not specified in the CTS.

RELOCATED SPECIFICATIONS

R01 **Unit 2 only:** CTS Tables 2.2-1, 3.3-1, and 4.3-1 provides requirements, in part, for the Loss of Component Cooling Water to Reactor Coolant Pumps – Low reactor trip function. The RPS initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and breaching the reactor coolant pressure boundary (RCPB) during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents. The protection and monitoring systems 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 Limiting Conditions for Operation on other reactor system parameters and equipment performance. Technical Specifications are required by 10 CFR 50.36 to include LSSS for variables that have significant safety functions.

The Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function specified in CTS Table 2.2-1, 3.3-1 and 4.3-1 is provided as a plant specific reactor trip as an equipment protective feature required as a stipulation by NRC staff in justifying acceptance of the Reactor Coolant Water Component Cooling Water piping design. This reactor trip is not required for reactor protection and is not assumed in any accident or transient analysis. In addition, this automatic reactor trip feature on a loss of component cooling water (CCW) flow to the reactor coolant pumps (RCPs) is not required to protect against violating the core specified acceptable fuel design limits or breaching the RCPB during AOOs and is not considered an LSSS for a variable that has a significant safety function. As a result, the Loss of Component Cooling Water to Reactor Coolant Pumps – Low reactor trip function will be relocated from the Technical Specifications to the Technical Requirements Manual (TRM).

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function is not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary.

2. The Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function is not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis that either assumes the failure of or challenge to the integrity of a fission product barrier.

3. The Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function is not a structure, system, or component that is part of the primary success path or which 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 loss of CCW flow to the RCPs is addressed in the PSL PRA with respect to requiring operator action to recover the CCW flow or remove the RCPs from service. The Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function is not a significant risk contributor to core damage frequency and offsite releases in the PSL PRA. Therefore, the Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function does not represent a structure, system, or component which operating experience

or probabilistic risk assessment has shown to be significant to public health and safety.

Since the selection criteria have not been satisfied for Loss of Component Cooling Water to Reactor Coolant Pumps – Low automatic reactor trip function, the requirements of this reactor trip instrument may be relocated to a licensee controlled document outside the Technical Specifications. Other reactor trip functions that are necessary to protect against violating the core specified acceptable fuel design limits or breaching the RCPB during AOOs are retained in the Technical Specifications (e.g., Reactor Coolant Flow – Low reactor trip and manual reactor trip functions). The Technical Specification requirements for the RPS Loss of Component Cooling Water to Reactor Coolant Pumps – Low Function will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as a relocation because the requirements for this instrument do not meet the criteria in 10 CFR 50.36(c)(2)(ii) and have been relocated to the TRM.

<u>REMOVED DETAIL CHANGES</u>

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 for RPS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.1-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.3.1 Table 3.3-1 Unit 1 footnote (f) and Unit 2 footnote (g) for Unit 1 CTS Function 2 and Unit 2 CTS Function 13a, respectively, state “There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.” ITS 3.3.1 Functions 1 and 2 do not include this information. The ITS only specifies that channels be OPERABLE. This changes the CTS by moving the design/operational detail to the UFSAR.

The removal of these details, related to system design, from Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The excore instrumentation overlap requirement is a system design detail not related to any RPS reactor trip function. ITS still retains the requirements for Wide Range and Power Range monitoring channels to be OPERABLE. In addition, overlap of the range is checked during power transition to ensure the design requirement for continuous monitoring over the full reactor power range. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. Any changes to the UFSAR are made under 10 CFR 50.59, which ensures changes are properly evaluated This change is designated as a less restrictive change because information relating to system design is being removed from the Technical Specifications.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 4.3-1 Functional Unit 2 Note (3) states, in part, "recalibrate the excore detectors which monitor the AXIAL SHAPE INDEX." ITS SR 3.3.1.3 does not contain the system description detail "which monitor the AXIAL SHAPE INDEX." This changes the CTS by moving the system description detail that the excore detectors monitor the AXIAL SHAPE INDEX to the UFSAR.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirements for performance of the surveillance requirement. Also, this change is acceptable because the removed information is adequately controlled in the UFSAR. The UFSAR is controlled under 10 CFR 50.59 which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA04 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements*) CTS 2.2.1 requires the RPS instrumentation setpoints to be set consistent with the Trip Setpoint values shown in Table 2.2-1. However, the CTS 2.2.1 Action is only required to be taken when the setpoint is less conservative than the Allowable Value column of Table 2.2-1. When the setpoint is less conservative than the Allowable Value, the channel is to be declared inoperable and adjusted consistent with the Trip Setpoint value. CTS Table 2.2-1 specifies both the Trip Setpoints and Allowable Values for the RPS Instrumentation Functional Units. ITS 3.3.1 requires the RPS instrumentation for each Function in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 specifies only the Allowable Values for the RPS Instrumentation Functions. The Allowable Values represent the OPERABILITY limit of the channels in ITS. This changes the CTS by moving the Trip Setpoints to the Technical Requirements Manual (TRM).

The purpose of the trip setpoint requirements is to ensure required automatic safety systems are actuated to protect against violating core design limits, breaching the Reactor Coolant System pressure boundary, and to mitigate accidents. Pursuant to 10 CFR 50.36(c)(1)(ii)(A), if it is determined that an automatic protective device for a variable on which a safety limit has been placed (i.e., limiting safety system setting) does not function as required, appropriate action is taken to ensure the abnormal situation is corrected before a safety limit is exceeded, which may include shutting down the reactor. The PSL Instrument Setpoint Methodology calculates nominal trip setpoints (NTSPs) using methods consistent with the guidance provided in NRC Regulatory Guide (RG) 1.105, “Setpoints For Safety-Related Instrumentation,” and ANSI/ISA Standard 67.04, "Setpoints for Nuclear Safety-Related Instrumentation." Additionally, pre-defined limits (double-sided Operability limits and as-left limits) are determined for each instrument consistent with the guidance provided in NRC RG 1.105 and ANSI/ISA–RP67.04, “Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation.” The instrument Operability limit band in plant uncertainty calculations is synonymous with the as-found acceptance criteria band specified in ITS and is centered about the nominal equipment setting (clarified in calculations as the field trip setpoint or NTSP). The PSL Instrument Setpoint Methodology, including the method of determining instrument uncertainties, was reviewed by the NRC during the review of Extended Power Uprate (EPU) as documented in the EPU safety evaluations for License Amendments 213 (Unit 1) and 163 (Unit 2), dated July 9, 2012 and September 4, 2012, respectively (NRC ADAMS Accession Nos. ML12181A019 and ML12235A463). The NRC staff determined that the PSL Instrument Setpoint Methodology described in the EPU license request meets the requirements of 10 CFR 50, Appendix A, General Design Criterion 13 and the regulatory guidance in RG 1.105 (EPU SE pg. 92 (Unit 1) and 95 (Unit 2)). The NRC staff also determined that the application of the clarifications of RG 1.105 in Regulatory Issue Summary 2006-17 “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” is acceptable (EPU SE pg. 94 (Unit 1) and 97 (Unit 2)).

The removal of these details for meeting Technical Specification requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Allowable Values associated with the RPS Instrumentation, which are designated as the Operability limits for the required instrument Functions. Footnotes (a) and (b) in Table 3.3.1-1 are included to ensure channel performance continues to verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology consistent with the NRC guidance specified in RIS 2006-17. Also, this change is acceptable because these types of procedural details will be adequately controlled in the TRM. Any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 2.2-1 Functional Unit 3 provides an Allowable Value of “≥ 95% of minimum reactor coolant flow with 4 pumps operating.*” Footnote * refers to CTS LCO 3.2.5 for the minimum reactor coolant flow for 4 pumps operating. ITS Table 3.3.1-1 Function 3 provides an Allowable Value for Reactor Coolant Flow – Low in terms of percent but does not include the detail of associated reactor coolant flow. This changes the CTS by moving the detail of what the setting in % is based on to the UFSAR.

The removal of this detail, related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the value for each of the Allowable Values. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. Any changes to the UFSAR are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA06 **Unit 2 only:** *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements*) CTS Table 3.3-1, Action 2 states, in part, that all functional units affected by the bypassed/tripped channel shall be placed in the bypassed/tripped condition. CTS Table 3.3-1, Action 2 provides a process instrument and Function bypass list that identifies the associated Functions that must be bypassed if the instrument becomes inoperable. ITS 3.3.1 ACTION A includes a Required Action to place the affected trip unit in trip or bypass within 1 hour. CTS LCO 3.0.2 and ITS LCO 3.0.2 establish that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. Therefore, when an instrument channel becomes inoperable, LCO 3.0.2 requires each Function affected by the inoperability shall be declared inoperable and the associated ACTIONS shall be met. The CTS process instrument and Function bypass list is not necessary in the Specifications. This information is removed from the Technical Specifications and moved to the UFSAR.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that all functional units receiving an input from an inoperable channel are bypassed or tripped. ITS 3.3.1 ACTIONS for each Function include a Required Action to place the affected trip unit in trip or bypass within 1 hour. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. The UFSAR is controlled under 10 CFR 50.59 which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA07 **Unit 2 only:** *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Table 2.2-1 Functional Unit 8, Allowable Values column, includes Note (3), that states, "% of the narrow range steam generator level indication." ITS Table 3.3.1-1 Steam Generator Level – Low Function (Functions 7.a and 7.b) do not include this design detail. This changes the CTS by moving the detail of what the setting in % is based on to the UFSAR.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Allowable Value requirement for the Steam Generator Level – Low RPS Function. Also, this change is acceptable because the removed information is currently provided in the UFSAR Section 7.2 where it is adequately controlled. The UFSAR is controlled under 10 CFR 50.59 which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 **Unit 1 only:** (*Category 2 – Relaxation of Applicability*) CTS Table 3.3-1 Functional Unit 11a Applicability requires OPERABILITY of the Wide Range Logarithmic Neutron Flux Monitor – Rate of Change of Power – High trip function in MODES 1, 2 and *. Footnote * states "with the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal." CTS Table 4.3-1 surveillance requirement applicability for Functional Unit 11 also includes a footnote * which states, "with reactor trip breaker closed." ITS 3.3.1 Function 2 requires the equivalent trip function to be OPERABLE in MODES 1 and 2. This changes the CTS by deleting the requirement for Rate of Change of Power – High trip function to be OPERABLE in MODES other than MODES 1 and 2 with the reactor trip circuit breakers (RTCBs) closed and the CEA drive system capable of CEA withdrawal.

The purpose of the requirement for the Rate of Change of Power – High trip function to be OPERABLE MODES other than MODES 1 and 2 with the RTCBs closed and the CEA drive system capable of CEA withdrawal is to ensure that a withdrawn CEA can be inserted in the event of an uncontrolled reactivity event during shutdown (i.e., MODES 3, 4, and 5). However, the Rate of Change of Power – High trip function is not assumed in any shutdown event (e.g., boron dilution event). The proposed change is consistent with the PSL Unit 2 CTS for the same function.

This change is acceptable because the uncontrolled CEA withdrawal event analysis is initiated from a MODE 2 startup condition at zero power with termination on a high-power trip signal. The high-power trip was used in the event analysis to determine the required initial overpower margin for DNBR and FCM (UFSAR Section 15.2.1). The rate of change of power trip is not credited in any accident analysis as providing primary protection for any limiting case accident, including any shutdown event. Appropriate reactor protection is provided in MODES 3, 4, and 5 when the RTCBs closed and any CEA is capable of being withdrawn by ITS LCO 3.3.2, which requires four Manual Trip channels and associated trip logic to be OPERABLE. Also, ITS LCO 3.3.11 requires two logarithmic neutron flux monitoring channels to be OPERABLE in MODES 3, 4 and 5 to monitor neutron flux power so a loss of SHUTDOWN MARGIN caused by boron dilution can be detected as an increase in flux. This change is designated as less restrictive because the LCO requirements are applicable in fewer plant conditions than in the CTS.

L02 **Unit 1 only:** (*Category 4 – Relaxation of Required Action*) CTS Table 3.3-1 Action 2.a requires, with the number of OPERABLE channels one less than the Total Number of Channels, to place the inoperable channel in the bypassed or tripped condition but do not provide an action for more than one RPS channel inoperable. Thus, CTS 3.0.3 would be required if two or more RPS Function channels are inoperable. ITS 3.3.1 ACTION B provides an allowance for one or more Functions with two RPS trip units or associated instrument channels inoperable except for the condition when the excore channels are not calibrated with the incore detectors. ITS 3.3.1 ACTION C provides an allowance for one or more Functions with one or more power range excore channels not calibrated within the incore detectors. ITS 3.3.1 ACTION B requires one trip unit to be placed in bypass and the other trip unit must be placed in trip within 1 hour and one trip unit must be restored to OPERABLE status within 48 hours. ITS 3.3.1 ACTION C requires performing SR 3.3.1.3 (Calibrate the power range excore channels with the incore detectors) in 24 hours or restrict THERMAL POWER to ≤ 90% RTP. This changes the CTS by providing actions for the condition of two RPS Function trip units or associated instrument channels inoperable and allowing one or more excore channels not calibrated to within the incore detectors.

The RPS Function channels are configured in a two-out-of-four coincidence. The two-out-of-four RPS logic is changed to a two-out-of-three logic for a given input parameter in one channel at a time by bypassing one channel input to the logic. With one channel of protective instrumentation bypassed, the RPS Function is in two-out-of-three logic, but with another channel failed the RPS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the RPS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, RPS actuation will occur. Therefore, it is also acceptable to allow an additional channel to be inoperable. When one or more power range excore channels are discovered not calibrated with the incore detectors, time is allowed to calibrate the power range instruments instead of placing the plant in a transient with the excore power range channels not calibrated. Alternatively, THERMAL POWER may be restricted to ≤ 90% RTP to provide additional margin to the fuel thermal limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the remaining RPS instrument channels, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. This change also provides appropriate remedial actions in lieu of requiring initiation of an unnecessary plant transient per ITS LCO 3.0.3 (CTS 3.0.3). The 48-hour Completion Time of proposed Required Action B.2 is based upon operating experience, which has demonstrated that a random failure of another channel occurring during the 48 hour period is a low probability event. The 24-hour Completion Time of proposed Required Actions C.1 and C.2 is adequate to calibrate the power range excore channels while minimizing the risk of operating in an unsafe condition. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 (*Category 4 – Relaxation of Required Action*) Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 do not explicitly provide requirements associated with the bypass removal feature associated with the following CTS Table 3.3-1 RPS Functional Units; Power Rate of Change – High (11.a), Reactor Coolant Flow – Low (3), Steam Generator Pressure – Low (6), Local Power Density – High (8), Thermal Margin/Low Pressure (9), and Loss of Load (10). However, CTS 4.3.1.1.2 and Unit 2 CTS 4.3.1.2 require channel functional and calibration testing of the channel bypass logic, which includes the bypass removal feature. Therefore, per the requirements of CTS 4.0.1 (ITS SR 3.0.1), CTS 3.3.1.1 (Unit 1) and CTS 3.3.1 (Unit 2) encompass the RPS channel bypass removal feature. If an RPS bypass removal channel is inoperable, CTS 3.0.3 is entered since there are no Conditions and Actions specified in the CTS. ITS 3.3.1 also includes Surveillances for the channel bypass removal feature. In addition, ITS 3.3.1 ACTIONS D and E are added to provide remedial measures when the bypass removal capability is inoperable to a required RPS Function channel. ITS Required Actions D.1 and E.1 require disabling the inoperable bypass channel within 1 hour when one or two bypass removal channels is inoperable. When one bypass removal channel is inoperable, ITS 3.3.1 ACTION D alternately allows placing the affected channel in bypass or trip within 1 hour and restoring the channel to OPERABLE status within 48 hours. When two bypass removal channels are inoperable, ITS 3.3.1 ACTION E alternately allows placing one channel in trip and the other channel in bypass, and restoring one channel to OPERABLE status within 48 hours. This changes the CTS by adding specific Technical Specification actions when one or two bypass removal channels are inoperable to the applicable Functions.

The purpose of the proposed actions is to provide appropriate remedial actions in the event the automatic bypass removal feature is inoperable. With one or two bypass removal channels inoperable, it is permissible to continue operation with the bypass permissive removal channels failed, providing the bypass is disabled. The Completion Times are consistent with the completion times for the conditions of one or two inoperable RPS channels. This change is also consistent with the ISTS.

This change is considered acceptable because the proposed remedial actions will ensure the related RPS Functions can continue to perform their related safety function when required by the plant design basis and safety analysis by requiring the bypass removal channel to be disabled or take action consistent with the current actions for an inoperable RPS channel. This change also provides appropriate remedial actions in lieu of requiring initiation of an unnecessary plant transient per ITS LCO 3.0.3 (CTS 3.0.3). This change is designated as less restrictive because the ITS ACTIONS provide remedial actions that are less restrictive than the CTS Action requiring a plant shutdown.

L04 **Unit 2 only:** (*Category 4 – Relaxation of Required Action*) CTS Table 3.3-1 Actions 2.a and 2.b provide actions for conditions with the number of OPERABLE channels one less than the Total Number of Channels and the condition with the number of channels OPERABLE one less than the Minimum Channels OPERABLE. ITS 3.3.1 Conditions A and B also provide Required Actions for these conditions except for the condition when the excore channels are not calibrated with the incore detectors. ITS 3.3.1 ACTION C provides an allowance for one or more Functions with one or more power range excore channels not calibrated within the incore detectors. ITS 3.3.1 ACTION C requires performing SR 3.3.1.3 (Calibrate the power range excore channels with the incore detectors) in 24 hours or restrict THERMAL POWER to ≤ 90% RTP. This changes the CTS by providing actions for the condition of one or more excore channels not calibrated to within the incore detectors.

When one or more power range excore channels is discovered not calibrated with the incore detectors, time is allowed to calibrate the power range instruments instead of placing the plant in a transient with the excore power range channels not calibrated. Alternatively, THERMAL POWER may be restricted to ≤ 90% RTP to provide additional margin to the fuel thermal limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the remaining RPS instrument channels, a reasonable time for recalibration, and the low probability of a DBA occurring during the calibration period. The 24-hour Completion Time of proposed Required Actions C.1 and C.2 is adequate to calibrate the power range excore channels while minimizing the risk of operating in an unsafe condition. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L05 **Unit 2 only:** (*Category 6 - Relaxation of Surveillance Requirement Acceptance Criteria*) CTS 4.3.1.1 and Table 4.3-1, Functional Unit 13 (Wide Range Logarithmic Neutron Flux Monitor) require, in part, a CHANNEL CALIBRATION on a Frequency in accordance with the Surveillance Frequency Control Program (SFCP). ITS SR 3.3.1.8 also requires a CHANNEL CALIBRATION but is modified by a Note stating, "Neutron detectors are excluded from CHANNEL CALIBRATION." This changes the CTS by excluding neutron detectors from the CHANNEL CALIBRATION requirement for the Logarithmic Neutron Flux Monitoring channels.

The purpose of a CHANNEL CALIBRATION is to ensure that the channel responds within the necessary range and accuracy to known values of the parameter that the channel monitors. Thus, to perform a channel calibration of a neutron flux channel would require including the neutron flux detector in the calibration. Inclusion of neutron flux detectors in the CHANNEL CALIBRATION process is impractical in power reactor applications because to do so would require subjecting the detectors to known neutron fluxes. Because of the hazards associated with exposing the neutron detectors, CTS Table 4.3-1 Note (4) excludes the detectors of Functional Unit 2 (Variable Power Level High) from CHANNEL CALIBRATION. The logarithmic neutron flux monitoring channels also use neutron detectors, which are subject to the same hazards as the detectors of the RPS Variable Power Level - High function. The Note excluding the neutron detectors from the calibration is acceptable because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. This proposed change is consistent with historical and current NRC staff requirements as reflected in ISTS. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L06 (*Category 2 – Relaxation of Applicability*) Unit 1 CTS Tables 3.3-1 (Unit 1) and 3.3.1-1 (Unit 2) require the OPERABILITY of Loss of Load (Turbine Hydraulic Fluid Pressure – Low) (Unit 1 Functional Unit 10 and Unit 2 Functional Unit 15) and Low Power Density – High (Unit 1 Functional Unit 8 and Unit 2 Functional Unit 9) trip functions in MODE 1. Tables 3.3-1 (Unit 1) and 3.3.1-1 (Unit 2) Notation (c) to the function(s) states, "Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is > 15% of RATED THERMAL POWER." In addition, Unit 1 Table 2.2-1 Notation (3) and Unit 2 Notation (5) state, "Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron- Flux power is greater than or equal to 15% of RATED THERMAL POWER." Footnote (g) to ITS Table 3.3.1-1 Functions 8 and 10 provide(s) the same allowance for bypassing and automatically removing the bypass for the Loss of Load and Local Power Density functions. In addition, ITS Footnote (g) provides similar allowances and Footnote (h) is added to clarify the Loss of Load and Local Power Density trip functions are not applicable and may be bypassed when THERMAL POWER is < 15% RTP and the functions are applicable in MODE 1 ≥ 15% RTP. This changes the CTS by relaxing the MODE 1 applicability requirement of the Loss of Load (turbine hydraulic fluid pressure – low) and Local Power Density RPS Functions to MODE 1 ≥ 15% RTP.

The purpose of the requirement for the Loss of Load (Turbine Hydraulic Fluid Pressure – Low) RPS Function to be OPERABLE in MODE 1 is to ensure the RPS trip function is OPERABLE in anticipation of a high pressurizer pressure RPS trip following a trip of the main turbine generator. The Loss of Load RPS trip is anticipatory for the loss of heat removal capabilities of the secondary system following a turbine trip. Thus, the trip minimizes the pressure and temperature transients on the reactor by initiating a trip before reaching the Pressurizer Pressure - High trip. The Loss of Load trip also prevents lifting the pressurizer safety valves, power operated relief valves (PORVs), and main steam safety valves (MSSVs) in the event of a main turbine generator trip. The proposed change to the Applicability is consistent with the ISTS.

The purpose of the requirement for the Local Power Density – High RPS Function to be OPERABLE in MODE 1 is to ensure excessive axial peaking will not cause fuel damage. It ensures that neither a DNBR less than the SAFETY LIMIT nor a peak linear heat rate corresponding to the temperature for fuel centerline melting will occur.

These changes are acceptable because the Loss of Load and Local Power Density RPS trips are not required to support any accident or transient event < 15% RTP. The Loss of Load and Local Power Density trips are currently allowed to be bypassed when THERMAL POWER falls below 15%. In addition, the Loss of Load RPS and Local Power Density trips are not credited in any accident analysis as providing primary protection for any limiting case accident. Appropriate reactor protection continues to be provided below 15% RTP by other reactor trips. This change is designated as less restrictive because the Loss of Load (turbine hydraulic fluid pressure – low) and Local Power Density RPS Functions are applicable in fewer plant conditions than in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.1 Reactor Protective System (RPS) Instrumentation ~~- Operating (Analog)~~ 2

LCO 3.3.1.1
LCO 2.2.1
DOC LA04

LCO 3.3.1 Four RPS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

Applicability
Table 3.3-1

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

ACTIONS

---NOTE---

DOC A03

Separate Condition entry is allowed for each RPS Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Action 2 A. One or more Functions with one RPS trip unit or associated instrument channel inoperable except for Condition C (excore channel not calibrated with incore detectors).	A.1 Place affected trip unit in bypass or trip. AND A.2.1 Restore channel to OPERABLE status. OR A.2.2 ~~[~~ Place affected trip unit in trip.	1 hour ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 48 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 3

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L02	B. One or more Functions with two RPS trip units or associated instrument channels inoperable except for Condition C (excore channel not calibrated with incore detectors).	B.1 Place one trip unit in bypass and place the other trip unit in trip.	1 hour
		AND	
		B.2 Restore one trip unit to OPERABLE status.	~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 3
DOC L02	C. One or more Functions with one or more power range excore channels not calibrated with the incore detectors.	C.1 Perform SR 3.3.1.3.	24 hours
		OR	
		C.2 Restrict THERMAL POWER to ≤ 90% RTP.	24 hours
DOC L03	D. One or more Functions with one automatic bypass removal channel inoperable.	D.1 Disable bypass channel.	1 hour
		OR	
		D.2.1 Place affected trip units in bypass or trip.	1 hour
		AND	
		D.2.2.1 Restore bypass removal channel and affected trip units to OPERABLE status.	~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 3
		OR	

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.2.2.2 ~~[~~ Place affected trip units in trip.	48 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 3
DOC L03 E. One or more Functions with two automatic bypass removal channels inoperable.	E.1 Disable bypass channels. OR E.2.1 ~~[~~ Place one affected trip unit in bypass and place the other in trip for each affected trip Function. AND E.2.2 Restore one automatic bypass removal channel and the associated trip unit to OPERABLE status for each affected trip Function.	1 hour 1 hour ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 3
DOC A08 F. Required Action and associated Completion Time not met for ~~Axial Power Distribution~~ Local Power Density and Loss of Load Trip Functions.	F.1 Reduce THERMAL POWER to < 15% RTP.	6 hours 1
DOC A08 G. Required Action and associated Completion Time not met except for ~~Axial Power Distribution~~ Local Power Density or Loss of Load Trip Functions.	G.1 Be in MODE 3.	6 hours 1

CTS

SURVEILLANCE REQUIREMENTS

-----NOTE-----

4.3.1.1.1 Refer to Table 3.3.1-1 to determine which SR shall be performed for each RPS Function.

CTS	SURVEILLANCE		FREQUENCY	
4.3.1.1.1 Table 4.3-1 Functional Units 2a, 2b, 3, 4, 5, 6, 7, 8, 9, 9a and 11	SR 3.3.1.1	Perform a CHANNEL CHECK of each RPS instrument channel except Loss of Load.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3
4.3.1.1.1 Functional Units 2a and 2b Table 4.3-1 Notation (2) DOC M04 Table 4.3-1 Notation (4)	SR 3.3.1.2	-----NOTES----- 1. Not required to be performed until 12 hours after THERMAL POWER is ≥ ~~[20]~~ 15 % RTP. 2. The ~~daily~~ calibration may be suspended during PHYSICS TESTS, provided the calibration is performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau. ----- Perform calibration (heat balance only) and adjust the excore power range and ΔT power channels to agree with calorimetric calculation ~~if the absolute difference is ≥ [1.5]%~~.	~~[24 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 1 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
4.3.1.1.1 Functional Units 2, 8, 9 and 11 Table 4.3-1 Notation (3) DOC M05	SR 3.3.1.3 -----NOTE----- Not required to be performed until 12 hours after THERMAL POWER is ≥ ~~[~~20~~]~~% RTP. 15 ----- Calibrate the power range excore channels using the incore detectors.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.1.1.1 Functional Units 2a, 2b, 3, 4, 5, 6, 7, 8, 9 and 9a Table 4.3-1 Notations (6) and (7)	SR 3.3.1.4 Perform a CHANNEL FUNCTIONAL TEST of each RPS channel except Loss of Load and Power Rate of Change.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.1.1.1 Functional Unit 2, 8, 9 and 11 Table 4.3-1 Notation 5	SR 3.3.1.5 -----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ----- Perform a CHANNEL CALIBRATION on excore power range channels.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

3

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY
4.3.1.1.2 Functional Units 10 and 11 Table 4.3-1 Notation (1)	SR 3.3.1.6	Perform a CHANNEL FUNCTIONAL TEST of each Power Rate of Change channel and each Loss of Load functional unit.	Once within 7 days prior to each reactor startup
4.3.1.1.2 Functional Units 2, 3, 8, 9, 9a, and 10	SR 3.3.1.7	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	~~Once within 92 days prior to each reactor startup~~ In accordance with the Surveillance Frequency Control Program 1
4.3.1.1.2 Functional Units 2, 3, 4, 5, 6, 7, 8, 9, 9a, 10 and 11 Table 4.3-1 Notation (5) DOC M03	SR 3.3.1.8	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform a CHANNEL CALIBRATION of each RPS instrument channel, including bypass removal functions.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ 3
4.3.1.1.3 Functional Units 2, 3, 4, 5, 6, 7, 8, 9, 9a, 10, and 11 Notation (5)	SR 3.3.1.9	------------------------------NOTE------------------------------ Neutron detectors are excluded. -- Verify RPS RESPONSE TIME is within limits.	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ 3

CTS

Table 3.3.1-1 (page 1 of 3)
Reactor Protective System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
Functional Unit 2 Table 2.2-1 Notation (1) Table 3.3.1-1 Notation (a)	1. Variable ~~High Power Trip~~ Power Level – High(c)	1, 2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[10]~~ 9.61% RTP above current THERMAL POWER but not < ~~[30]~~ 15% RTP nor > ~~[~~107~~]~~ % RTP	1
Functional Unit 11a Table 2.2-1 Notation (4) Table 3.3-1 Notation (d) and ** DOC L01	2. Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change - High(~~c~~)(d)	1, 2 (e)	SR 3.3.1.1 SR 3.3.1.6(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b)	≤ ~~[2.6]~~ 2.49 dpm	
Functional Unit 3 Table 2.2-1 Notation (1) Table 3.3-1 Notation (a)	3. Reactor Coolant Flow - Low(~~d~~)(c)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[~~95~~]~~%	3
Functional Unit 4	4. Pressurizer Pressure - High	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[~~2400~~]~~ psia	
Functional Unit 5	5. Containment Pressure - High	1, 2	~~[~~SR 3.3.1.1~~]~~ SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[4.0]~~ 3.3 psig	

Table 4.3-1 Footnote (6) DOC M01

(a) If the as-found instrument channel setpoint is outside its predefined as-found ~~tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

Table 4.3-1 Footnote (7) DOC M02

(b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~L~~NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~L~~NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~L~~NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively. 3

Table 2.2-1 Notation (4) Table 3.3.1-1 Notation (d)

(~~c~~)(d) Trip may be bypassed when THERMAL POWER is < ~~[~~1E-4~~]~~% RTP or > ~~[13]~~ 15% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~1E-4~~]~~% RTP and ≤ ~~[13]~~ 15% RTP. 3

Table 2.2-1 Notation (1) Table 3.3.1-1 Notation (a)

(~~d~~)(c) Trips may be bypassed when THERMAL POWER is < ~~[~~1~~E-4]~~%. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~1~~E-4]~~% RTP. ~~During testing pursuant to LCO 3.4.17, RCS Loops - Test Exceptions, trips may be bypassed below 5% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ 5% RTP.~~ 5

Table 2.2-1 Notation **

(e) Trip not applicable when THERMAL POWER is > 15% RTP. 1

Reorder

CTS

Table 3.3.1-1 (page 2 of 3)
Reactor Protective System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
Functional Unit 6 Table 2.2-1 Notation (2) Table 3.3-1 Notation (b)	6. Steam Generator Pressure - Low(~~e~~)(f)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[685]~~ 600 psia
Functional Unit 7	7a. Steam Generator A Level - Low	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[24.7]~~ 35%
Functional Unit 7	7b. Steam Generator B Level - Low	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[24.7]~~ 35%
Functional Unit 8 Table 2.2-1 Notation (3) Table 3.3-1 Notation (c) DOC L06	~~[~~8. ~~Axial Power Distribution~~ Local Power Density - High	1(~~f~~)(g)(h)	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	Figure 3.3.1-3~~]~~

3 1

Table 4.3-1 Footnote (6) DOC M01

(a) If the as-found instrument channel setpoint is outside its predefined as-found ~~tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

Table 4.3-1 Footnote (7) DOC M02

(b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~L~~TSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. N Setpoints more conservative than the ~~L~~TSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~L~~TSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively.

4

Table 2.2-1 Notation (2) Table 3.3-1 Notation (b)

(~~e~~)(f) Trip may be bypassed when steam generator pressure is < ~~[785]~~ 685 psig. Bypass shall be automatically removed when steam generator pressure is ≥ ~~[785]~~ 685 psig.

Table 2.2-1 Notation (3) Table 3.3-1 Notation (c)

(~~f~~)(g) Trip is not applicable and may be bypassed when THERMAL POWER is < ~~[~~15~~]~~% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~15~~]~~% RTP.

DOC L06

(~~g~~)(h) Trip is only applicable in MODE 1 ≥ ~~[~~15~~]~~% RTP.

3

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Table 3.3.1-1 (page 3 of 3)
Reactor Protective System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
Functional Unit 9 Table 2.2-1 Notation (1) Table 3.3-1 Notation (a) DOC M06	9a. Thermal Margin/Low Pressure (TM/LP)(~~a~~ c)	1, 2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.7 [SR 3.3.1.8](a)(b) SR 3.3.1.9	Figures 3.3.1-1 and 3.3. 1-2 and ≥ 1887 psia	1
Functional Unit 9a Table 2.2-1 Notation (1) Table 3.3-1 Notation (a)	[9b. Steam Generator Pressure Difference(~~a~~ c)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ [135] psid ~~]~~	3
Functional Unit 10 Table 2.2-1 Notation (3) Table 3.3-1 Notation (c) DOC L06	10. Loss of Load (turbine ~~stop valve control oil pressure~~ hydraulic fluid pressure - low)	1(~~f~~ h) (g)	SR 3.3.1.6(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b)	≥ [800] psig	

Table 4.3-1 Footnote (6) DOC M01

(a) If the as-found instrument channel setpoint is outside its predefined as-found ~~tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

Table 4.3-1 Footnote (7) DOC M02

(b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~L~~ NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. N Setpoints more conservative than the ~~L~~ NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~L~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively. 3

Table 2.2-1 Notation (1) Table 3.3-1 Notation (a)

(~~d~~ c) Trips may be bypassed when THERMAL POWER is < [1~~E-4~~]%. Bypass shall be automatically removed when THERMAL POWER is ≥ [1~~E-4~~]% RTP. ~~During testing pursuant to LCO 3.4.17, trips may be bypassed below 5% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ 5% RTP.~~ 5

Table 2.2-1 Notation (3) Table 3.3-1 Notation (c)

(~~f~~ g) Trip is not applicable and may be bypassed when THERMAL POWER is < [15]% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ [15]% RTP. 3

DOC L06

(~~g~~ h) Trip is only applicable in MODE 1 ≥ [15]% RTP.

CTS

Replace with CTS Figure 2.2-3 1

Figure 2.2-3

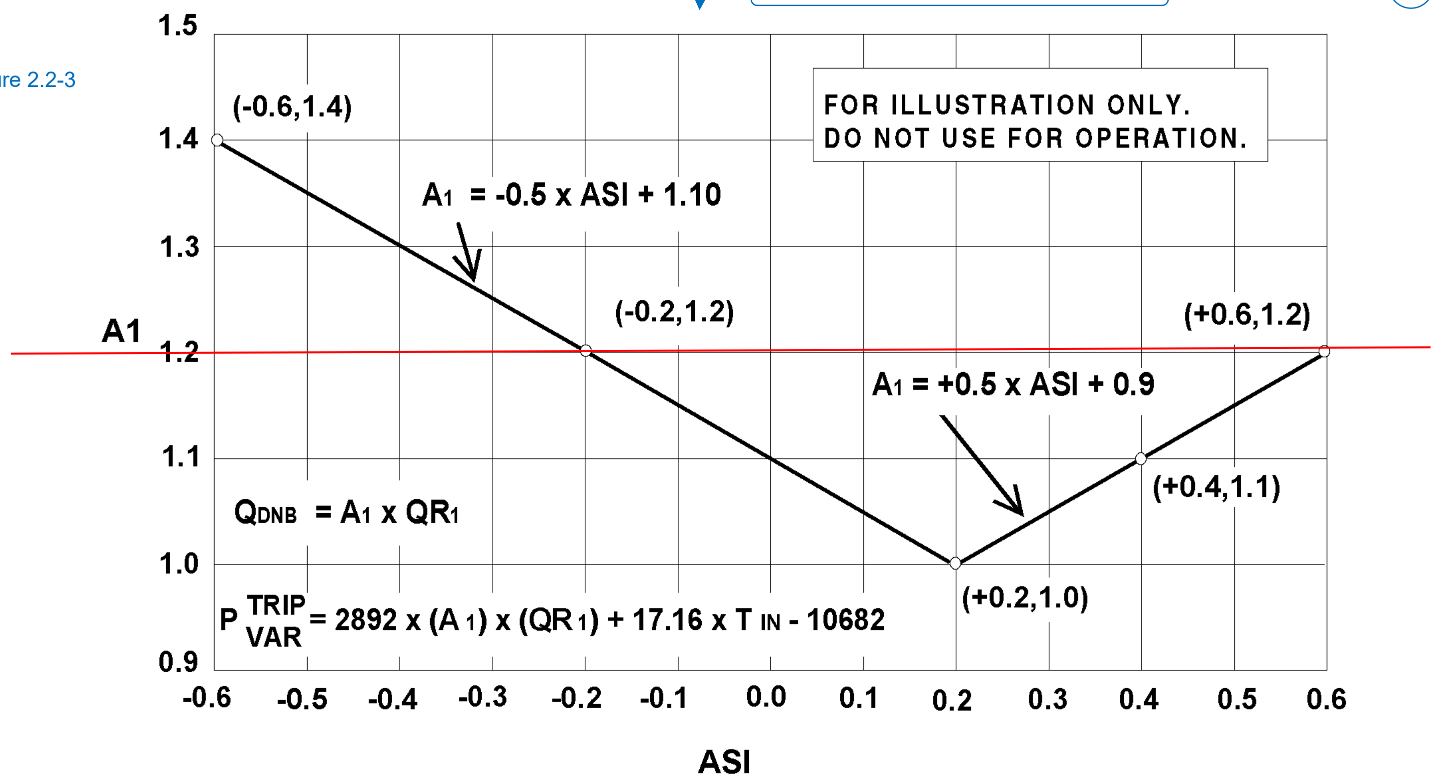

Figure 3.3.1-1 (page 1 of 1)
Thermal Margin/Low Pressure Trip Setpoint: ASI vs A_1

CTS

Replace with CTS Figure 2.2-4 1

Figure 2.2-4

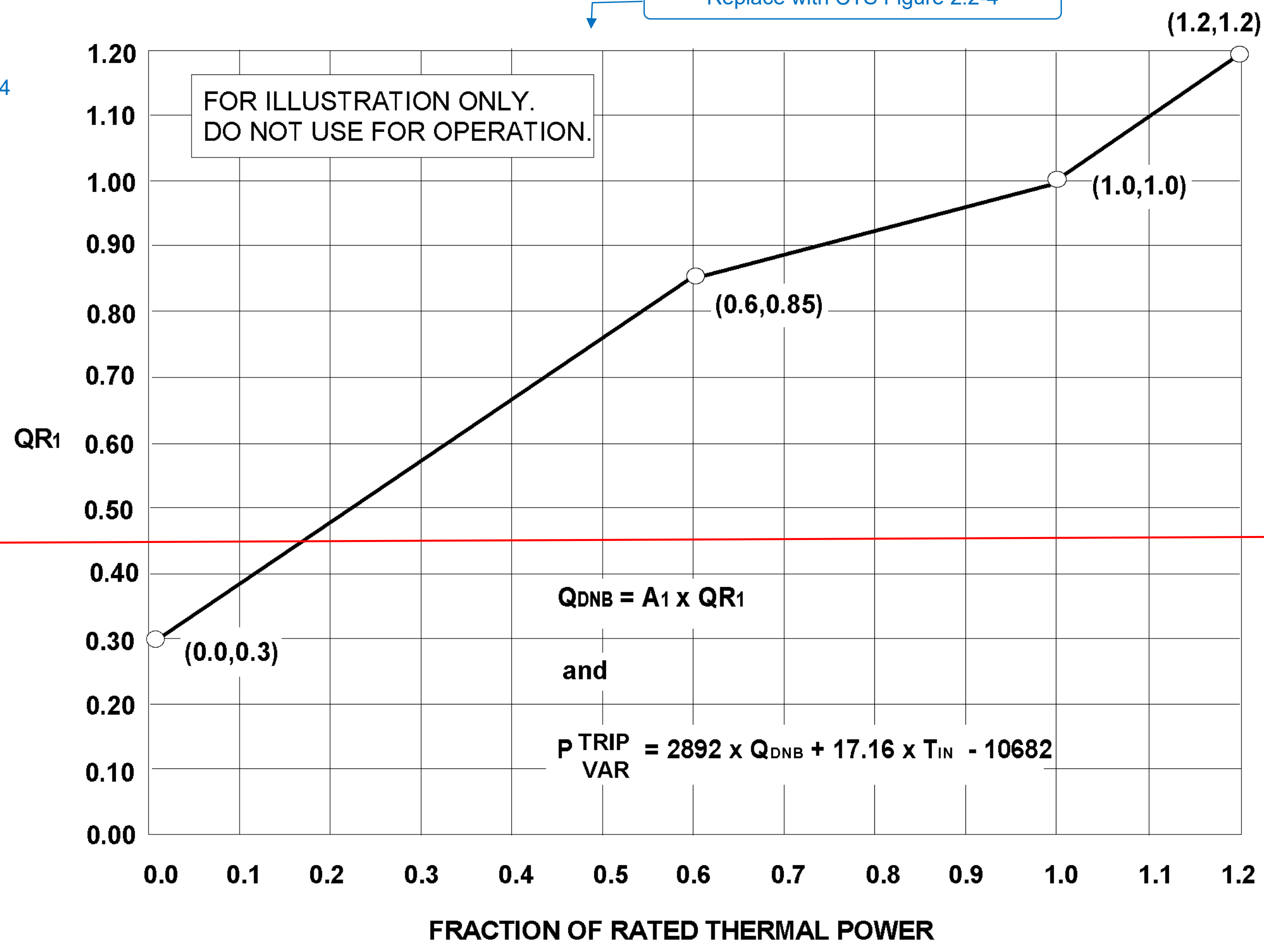

Figure 3.3.1-2 (page 1 of 1)
Thermal Margin/Low Pressure Trip Setpoint: Fraction of RTP vs QR 1

Insert CTS Figure 2.2-1

CTS

Replace with CTS Figure 2.2-2 1

Figure 2.2-2

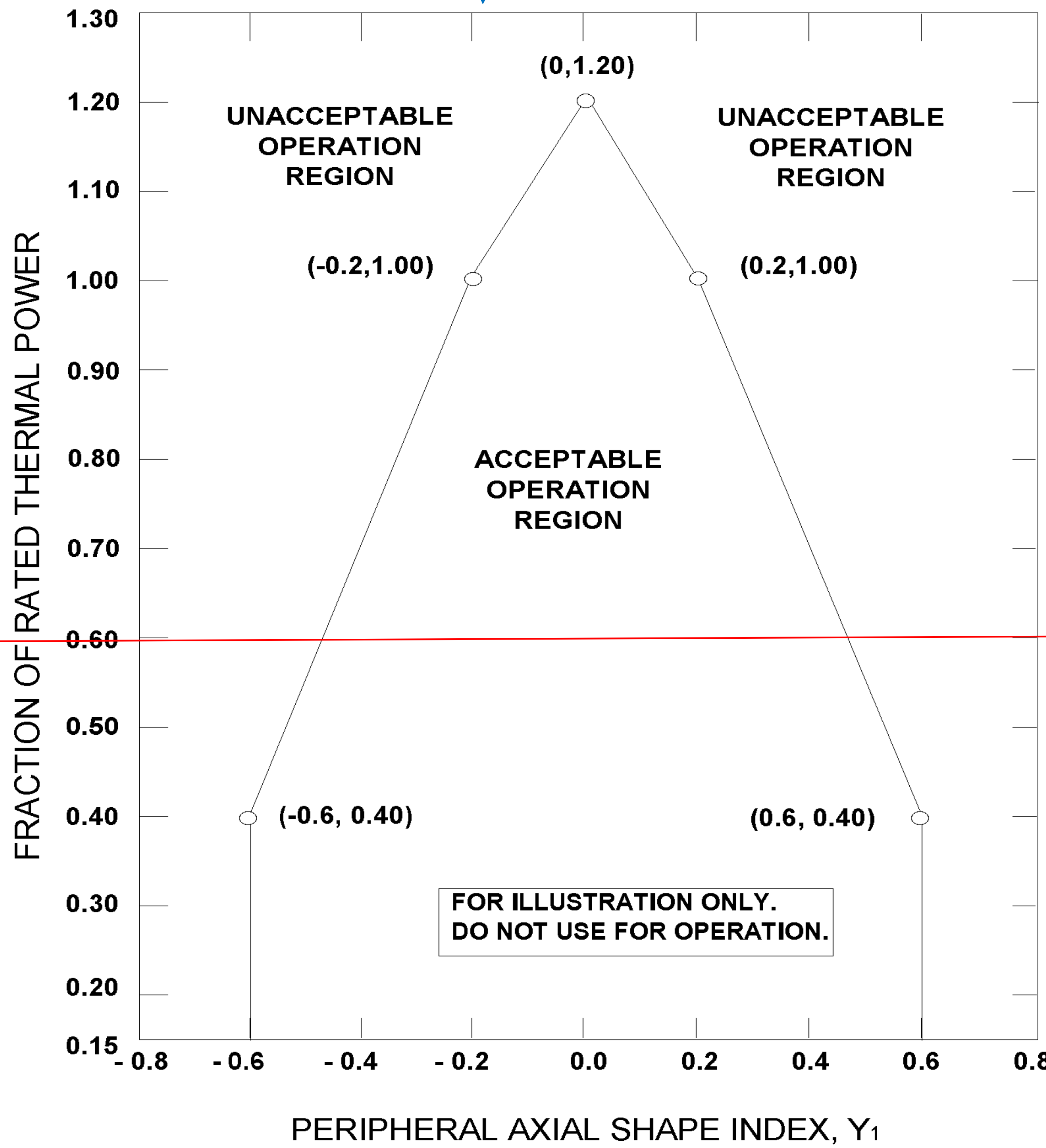

Figure 3.3.1-3 (page 1 of 1)
Peripheral Axial Shape Index, Y_1 vs Fraction of RTP

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.1 Reactor Protective System (RPS) Instrumentation ~~- Operating (Analog)~~ 2

LCO 2.2.1
LCO 3.3.1
DOC LA04

LCO 3.3.1 Four RPS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

Applicability
Table 3.3-1

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

ACTIONS

---NOTE---

DOC A03

Separate Condition entry is allowed for each RPS Function.

Action 2.a
DOC A10

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one RPS trip unit or associated instrument channel inoperable except for Condition C (excore channel not calibrated with incore detectors).	A.1 Place affected trip unit in bypass or trip.	1 hour
	AND	
	A.2~~.1~~ Restore channel to OPERABLE status.	Prior to entering MODE 2 following next MODE 5 entry. ~~[48] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~
	~~OR~~	
	~~A.2.2 [Place affected trip unit in trip.~~	~~48 hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~

------------NOTE------------
Required Action A.2 must be completed whenever this Condition is entered.

7

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action 2.b	B. One or more Functions with two RPS trip units or associated instrument channels inoperable except for Condition C (excore channel not calibrated with incore detectors).	B.1 Place one trip unit in bypass and place the other trip unit in trip. ~~AND~~ ~~B.2 Restore one trip unit to OPERABLE status.~~	1 hour ~~[48] hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 7
DOC L02	C. One or more Functions with one or more power range excore channels not calibrated with the incore detectors.	C.1 Perform SR 3.3.1.3. OR C.2 Restrict THERMAL POWER to ≤ 90% RTP.	24 hours 24 hours
DOC L03	D. One or more Functions with one automatic bypass removal channel inoperable.	D.1 Disable bypass channel. OR D.2.1 Place affected trip units in bypass or trip. AND D.2.2.1 Restore bypass removal channel and affected trip units to OPERABLE status. OR	1 hour 1 hour ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 3

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	D.2.2.2 ~~[~~ Place affected trip units in trip.	48 hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 3
DOC L03 E. One or more Functions with two automatic bypass removal channels inoperable.	E.1 Disable bypass channels. OR E.2.1 ~~[~~ Place one affected trip unit in bypass and place the other in trip for each affected trip Function. AND E.2.2 Restore one automatic bypass removal channel and the associated trip unit to OPERABLE status for each affected trip Function.	1 hour 1 hour ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 3
DOC A08 F. Required Action and associated Completion Time not met for ~~Axial Power Distribution~~ Local Power Density and Loss of Load Trip Functions.	F.1 Reduce THERMAL POWER to < 15% RTP.	6 hours 1
DOC A08 G. Required Action and associated Completion Time not met except for ~~Axial Power Distribution~~ Local Power Density or Loss of Load Trip Functions.	G.1 Be in MODE 3.	6 hours 1

CTS

SURVEILLANCE REQUIREMENTS

--NOTE--

4.3.1.1 Refer to Table 3.3.1-1 to determine which SR shall be performed for each RPS Function.

CTS	SURVEILLANCE		FREQUENCY	
4.3.1.1 Table 4.3-1 Functional Units 2a, 2b, 3, 4, 5, 6, 7, 8, 9, 13, and 14	SR 3.3.1.1	Perform a CHANNEL CHECK of each RPS instrument channel except Loss of Load.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3
4.3.1.1 Table 4.3-1 Functional Units 2a and 2b Notation (2) Notation (4) DOC M04	SR 3.3.1.2	----------------------------NOTES---------------------------- 1. Not required to be performed until 12 hours after THERMAL POWER is ≥ ~~[20]~~ 15 % RTP. 2. The ~~daily~~ calibration may be suspended during PHYSICS TESTS, provided the calibration is performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau. --- Perform calibration (heat balance only) and adjust the excore power range and ΔT power channels to agree with calorimetric calculation ~~if the absolute difference is ≥ [1.5]%~~.	~~[24 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 1 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
4.3.1.1 Table 4.3-1 Functional Unit 2, 4, 9, and 13a Notation (3) DOC M05	SR 3.3.1.3 ------------------------------NOTE------------------------------ Not required to be performed until 12 hours after THERMAL POWER is ≥ ~~[20]~~ 15 % RTP. -- Calibrate the power range excore channels using the incore detectors.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.1.1 Table 4.3-1 Functional Units 2a, 2b, 3, 4, 5, 6, 7, 8, 9, 10 and 14	SR 3.3.1.4 Perform a CHANNEL FUNCTIONAL TEST of each RPS channel except Loss of Load and Power Rate of Change.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.1.1 Table 4.3-1 Functional Unit 2, 4, 9, and 13a Notation (4)	SR 3.3.1.5 ------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform a CHANNEL CALIBRATION on excore power range channels.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

3

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY
4.3.1.1 Table 4.3-1 Functional Units 13 and 15 DOC L02	SR 3.3.1.6	Perform a CHANNEL FUNCTIONAL TEST of each Power Rate of Change channel and each Loss of Load functional unit.	Once within 7 days prior to each reactor startup
4.3.1.2 Table 4.3-1 Functional Units 2, 4, 7, 9, 14 and 15	SR 3.3.1.7	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	In accordance with the Surveillance Frequency Control Program ~~Once within 92 days prior to each reactor startup~~ 1
4.3.1.2 Functional Units 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14 and 15 Notation (4) DOC M03 DOC L04	SR 3.3.1.8	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform a CHANNEL CALIBRATION of each RPS instrument channel, including bypass removal functions.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 3
4.3.1.3 Functional Units 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14 and 15 Notation (4)	SR 3.3.1.9	------------------------------NOTE------------------------------ Neutron detectors are excluded. -- Verify RPS RESPONSE TIME is within limits.	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 3

CTS

Table 3.3.1-1 (page 1 of 3)
Reactor Protective System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
Functional Unit 2 Table 3.3-1 Footnote a Table 2.2-1 Footnote (1)	1. Variable ~~High~~ ~~Power Trip~~ Power Level – High(c)	1, 2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[10]~~ 9.61% RTP above current THERMAL POWER but not < ~~[30]~~ 15% RTP nor > ~~[~~107~~]~~ % RTP	1
Functional Unit 13 Table 3.3-1 Footnotes ** and e Table 2.2-1 Footnote (4)	2. Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change - High(~~e~~)(d)	1, 2(e)	SR 3.3.1.1 SR 3.3.1.6(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b)	≤ ~~[2.6]~~ 2.49 dpm	3
Functional Unit 14 Table 3.3-1 Footnote a Table 2.2-1 Footnote (1)	3. Reactor Coolant Flow - Low(~~d~~)(c)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[95]~~ 94.9%	
Functional Unit 3	4. Pressurizer Pressure - High	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[2400]~~ 2374 psia	
Functional Unit 5	5. Containment Pressure - High	1, 2	~~[~~SR 3.3.1.1~~]~~ SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[4.0]~~ 3.1 psig	

Table 4.3-1 Footnote (8) DOC M01
(a) If the as-found instrument channel setpoint is outside its predefined as-found ~~tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

Table 4.3-1 Footnote (9) DOC M02
(b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~L~~NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~L~~NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~L~~NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively. 4 3

Table 3.3-1 Footnote e Table 2.2-1 Footnote (4)
(~~c~~d) Trip may be bypassed when THERMAL POWER is < ~~[~~1E-4~~]~~% RTP or > ~~[13]~~ 15% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~1E-4~~]~~% RTP and ≤ ~~[13]~~ 15% RTP. 3

Table 3.3-1 Footnote e Table 2.2-1 Footnote (1)
(~~d~~c) Trips may be bypassed when 0.5 THERMAL POWER is < ~~[1E-4]~~ 0.5%. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[1E-4]~~% RTP. ~~During testing pursuant to LCO 3.4.17, RCS Loops - Test Exceptions, trips may be bypassed below 5% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ 5% RTP.~~ 5

Table 2.2-1 Notation **
(e) Trip not applicable when THERMAL POWER is > 15% RTP. 1

Reorder

CTS

Table 3.3.1-1 (page 2 of 3)
Reactor Protective System Instrumentation

CTS		FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
Functional Unit 6 Table 3.3-1 Footnote b Table 2.2-1 Footnote (2)	6.	Steam Generator Pressure - Low(~~e~~) (f)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[685]~~ 621 psia	3
Functional Unit 8	7a.	Steam Generator A Level - Low	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[24.7]~~ 35%	
Functional Unit 8	7b.	Steam Generator B Level - Low	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≥ ~~[24.7]~~ 35%	
Functional Unit 9 Table 3.3-1 Footnote c Table 2.2-1 Footnote (5) DOC L06	~~[~~8.	Local Power Density ~~Axial Power Distribution~~ - High	1(~~f~~)(g) (h)	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b) SR 3.3.1.9	Figure 3.3.1-3~~]~~	1

Table 4.3-1 Footnote (8) DOC M01

(a) If the as-found instrument channel setpoint is outside its predefined as-found acceptance criteria band ~~tolerance~~, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

Table 4.3-1 Footnote (9) DOC M02

(b) The instrument channel setpoint shall be reset to a value that is within the as-left acceptance criteria band ~~tolerance~~ around the Nominal ~~Limiting~~ Trip Setpoint (N~~L~~TSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the N~~L~~TSP are acceptable provided that the as-found and as-left acceptance criteria bands ~~tolerances~~ apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The N~~L~~TSP and the methodologies used to determine the as-found and as-left acceptance criteria bands ~~tolerances~~ are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively. 4

Table 3.3-1 Footnote b Table 2.2-1 Footnote (2)

(f)(~~e~~) Trip may be bypassed when steam generator pressure is < ~~[785]~~ 705 psig. Bypass shall be automatically removed when steam generator pressure is ≥ ~~[785]~~ 705 psig.

Table 3.3-1 Footnote c Table 2.2-1 Footnote (5)

(g)(~~f~~) Trip is not applicable and may be bypassed when THERMAL POWER is < ~~[~~15~~]~~% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~15~~]~~% RTP. 3

DOC L06

(h)(~~g~~) Trip is only applicable in MODE 1 ≥ ~~[~~15~~]~~% RTP.

CTS

Table 3.3.1-1 (page 3 of 3)
Reactor Protective System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
Functional Unit 4 Table 3.3-1 Footnote a Table 2.2-1 Footnote 1	9a. Thermal Margin/Low Pressure (TM/LP)(~~d~~ c)	1, 2	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.4(a)(b) SR 3.3.1.5(a)(b) SR 3.3.1.7 ~~[~~SR 3.3.1.8~~]~~(a)(b) SR 3.3.1.9	Figures 3. 3.1-1 and 3.3.1-2 and ≥ 1900 psia	1
Functional Unit 7 Table 3.3-1 Footnote a Table 2.2-1 Footnote (1)	9b. Steam Generator Pressure Difference(~~d~~ c)	1, 2	SR 3.3.1.1 SR 3.3.1.4(a)(b) SR 3.3.1.8(a)(b) SR 3.3.1.9	≤ ~~[~~13~~5]~~ 2 psid~~]~~	3
Functional Unit 15 Table 3.3-1 Footnote c Table 2.2-1 Footnote (5) DOC L06	10. Loss of Load (turbine ~~stop valve control oil pressure~~ hydraulic fluid pressure - low)	1 ~~(f)~~ (g) (h)	SR 3.3.1.6(a)(b) SR 3.3.1.7 SR 3.3.1.8(a)(b)	≥ ~~[~~800~~]~~ psig	

Table 4.3-1 Footnote (8) DOC M01 — (a) If the as-found instrument channel setpoint is outside its predefined as-found ~~tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

Table 4.3-1 Footnote (9) DOC M02 — (b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~L~~ NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~L~~ NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~L~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Safety Analysis Report, respectively.

Table 3.3-1 Footnote a Table 2.2-1 Footnote (1) DOC A09 — (~~d~~ c) Trips may be bypassed when THERMAL POWER is < ~~[1E-4]~~ 0.5%. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[1E-4]~~ 0.5% RTP. ~~During testing pursuant to LCO 3.4.17, trips may be bypassed below 5% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ 5% RTP.~~ 5 3

Table 3.3-1 Footnote c Table 2.2-1 Footnote (5) — (~~f~~ g) Trip is not applicable and may be bypassed when THERMAL POWER is < ~~[~~15~~]~~% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ ~~[~~15~~]~~% RTP.

DOC L06 — (~~g~~ h) Trip is only applicable in MODE 1 ≥ ~~[~~15~~]~~% RTP.

CTS

Replace with CTS Figure 2.2-3 1

Figure 2.2-3

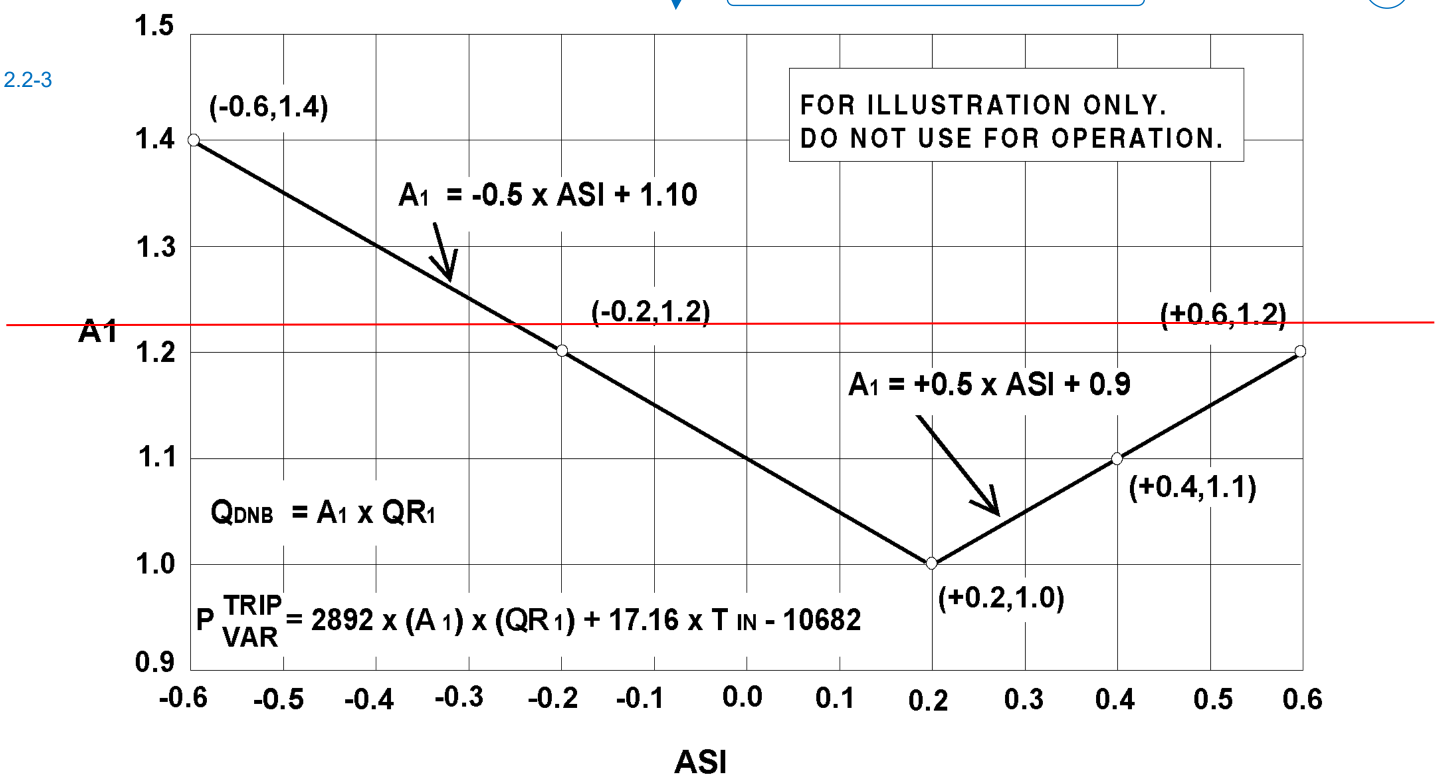

Figure 3.3.1-1 (page 1 of 1)
Thermal Margin/Low Pressure Trip Setpoint: ASI vs A_1

CTS

Replace with CTS Figure 2.2-4 1

Figure 2.2-4

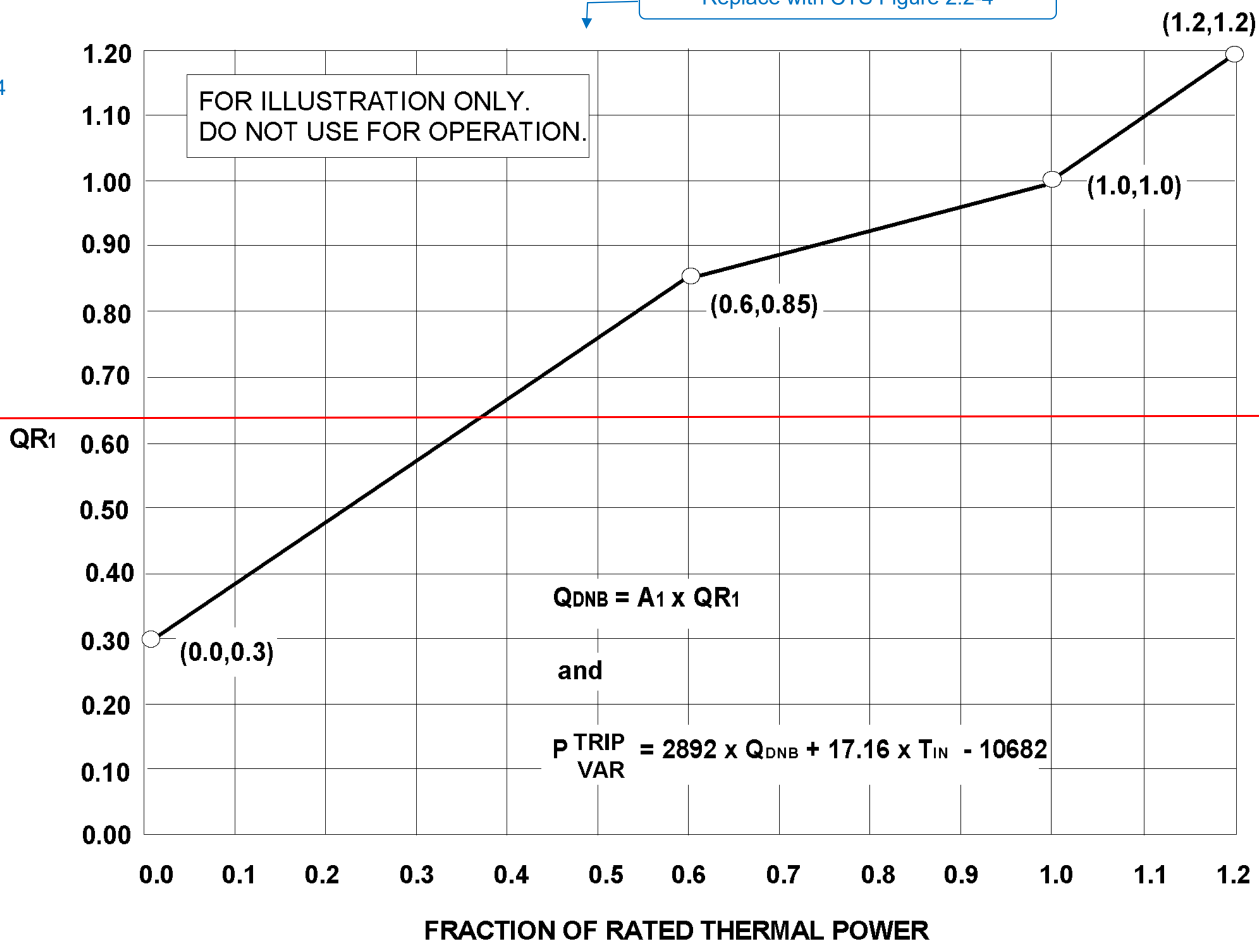

Figure 3.3.1-2 (page 1 of 1)
Thermal Margin/Low Pressure Trip Setpoint: Fraction of RTP vs QR 1

Insert CTS Figure 2.2-1

CTS

Replace with CTS Figure 2.2-2 1

Figure 2.2-2

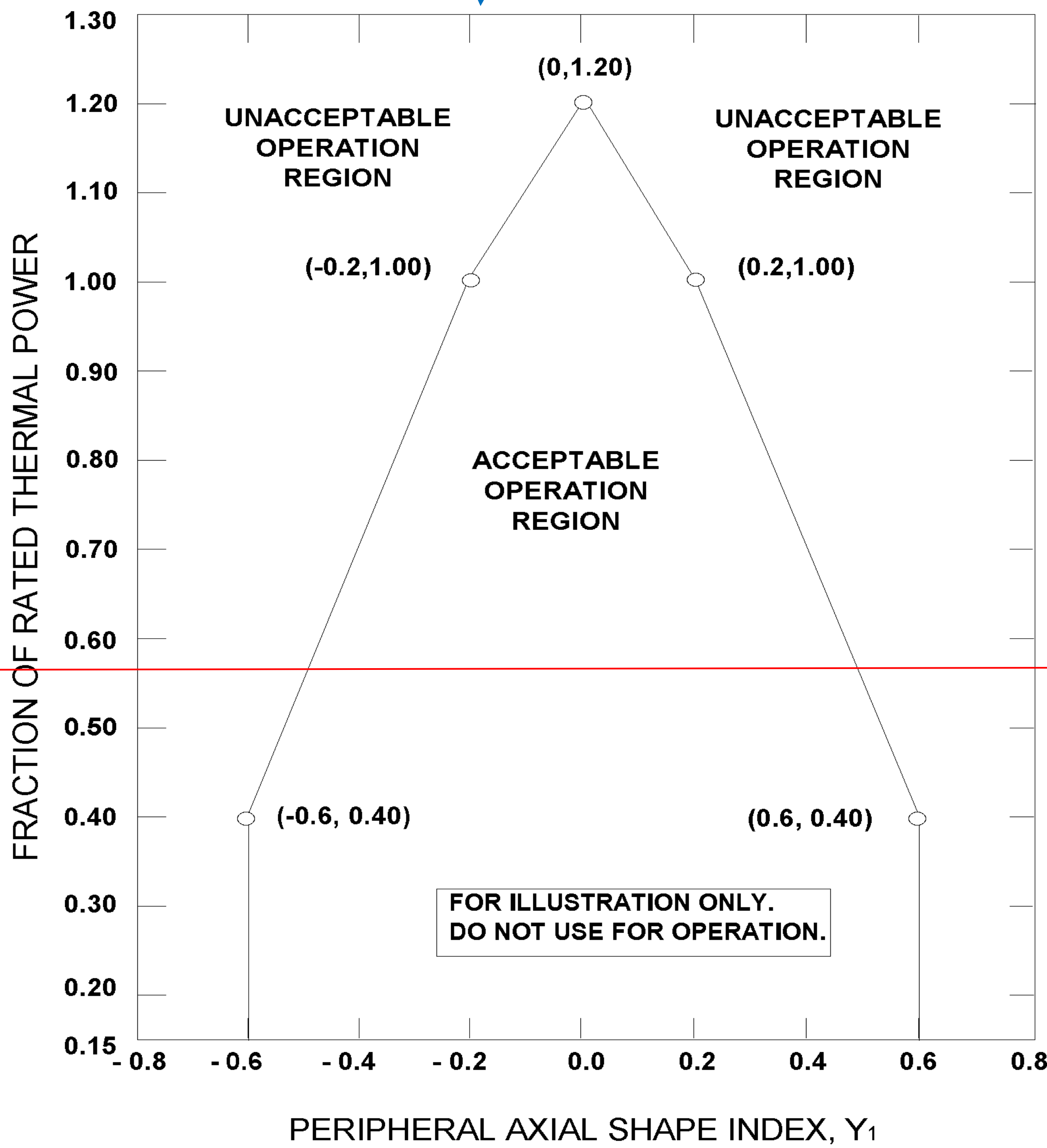

Figure 3.3.1-3 (page 1 of 1)
Peripheral Axial Shape Index, Y_1 vs Fraction of RTP

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.1, REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.1 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. PSL does not use the terms “as-found tolerance” and “Limiting Trip Setpoint (LTSP)” in plant specific instrument calculations or the Updated Final Safety Analysis Report. Therefore, the use of these terms in Footnotes (a) and (b) in ISTS Table 3.3.1-1 are revised in the ITS to include the plant specific terminology. To comply with the guidance provided in NRC Regulatory Issue Summary 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” the PSL setpoint calculations have been structured to include a Nominal Trip Setpoint (NTSP), also known as the field trip setpoint, and determination of an OPERABILITY limit range, referred to in CTS as acceptance criteria band. For PSL, the Nominal Trip Setpoint (NTSP) is synonymous with the Limiting Trip Setpoint (LTSP) and the as-found acceptance criteria band (i.e., OPERABILITY limit range) is synonymous with the as-found tolerance.

5. This Reactor Coolant System Loops - Test Exceptions Specification is not included in the PSL Unit 1 and Unit 2 ITS because the exception is not needed to perform any required startup or PHYSICS TESTS.

6. The addition of Footnote (e) to Function 2 (Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change – High) in ITS Table 3.3.1-1, reflects current licensing basis as approved in License Amendment 243 (Unit 1) and Amendment 194 (Unit 2), dated October 31, 2017 (NRC ADAMS Accession Number ML17257A015). In addition to allowing the Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change – High RPS Function channels to be bypassed when THERMAL is > 15% RPT, this change allowed the RPS Function to not apply when THERMAL POWER is > 15% RTP. As stated in the NRC Safety Evaluation accompanying the license amendments, the NRC staff determined that the change to limit MODE 1 applicability for the Wide Range Logarithmic Neutron Flux Monitor Power Rate of Change – High RPS Function to ≤15% RTP neither physically changes any plant systems, structures, or components, nor modifies any plant procedure or methodology for this phase of plant operation, and therefore, is acceptable.

7. **Unit 2 only:** ISTS 3.3.1, Required Action A.2.2 is deleted and the Completion Time of Required Action A.2.1 (ITS 3.3.1, Required Action A.2) is modified in the Unit 2 ITS consistent with the PSL current licensing basis to allow the inoperable channel to be in trip or bypass until the next plant startup following entry into MODE 5. In

addition, ISTS Required Action B.2 is unnecessary since ACTION A requires restoration of the channel to OPERABLE status with no option to place the trip unit in the trip condition indefinitely. These changes to the ISTS 3.3.1 ACTIONS A and B are similar to ISTS 3.3.1 (Digital) ACTIONS A and B. The Unit 2 RPS design includes independence of the four protection channels to ensure no single failure (e.g., circuit fault) can adversely affect more than one channel. As discussed in Section 7.2.4 of NUREG-0843, "Safety Evaluation Report - St. Lucie Unit 2," the NRC concluded that the RPS design enhancements were sufficient to ensure the independence of the four protection channels. Thus, the Unit 2 Technical Specifications allow a failed channel to be placed in long term trip or bypass condition provided the channel is restored no later than the next cold shutdown following the channel malfunction. A Note is added to ITS 3.3.1 Condition A stating that Required Action A.2 shall be completed when Condition A is entered. This Note constitutes an "unless otherwise stated" exception to LCO 3.0.2 to require the action to be completed within the associated Completion Time even when the LCO is no longer applicable. The added Note is similar to other Notes in the ISTS (e.g., Note to Condition A of ISTS 3.2.3 and the Note to Conditions A and C of ISTS 3.4.3.).

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.1 Reactor Protective System (RPS) Instrumentation ~~- Operating (Analog)~~

2

BASES

BACKGROUND

The Reactor Protective System (RPS) initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and breaching the reactor coolant pressure boundary (RCPB) during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents.

The protection and monitoring systems 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.

Technical Specifications are required by 10 CFR 50.36 to include LSSS for variables that have significant safety functions. LSSS are defined by the regulation as "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a safety action is initiated, as established by the safety analysis, to ensure that a SL is not exceeded. Any automatic protection action that occurs on reaching the Analytical Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protection channels must be chosen to be more conservative than the Analytical Limit to account for channel uncertainties related to the setting at which the automatic protective action would actually occur.

~~------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The term "Limiting Trip Setpoint" [LTSP] is generic terminology for the calculated trip setting (setpoint) value calculated by means of the plant specific setpoint methodology documented in a document controlled under 10 CFR 50.59. The term [LTSP] indicates that no additional margin has been added between the Analytical Limit and the calculated trip setting.~~

~~"Nominal Trip Setpoint [NTSP]" is the suggested terminology for the actual setpoint implemented in the plant surveillance procedures where margin has been added to the calculated [LTSP]. The as-found and as-left tolerances will apply to the [NTSP] implemented in the Surveillance procedures to confirm channel performance.~~

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BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances in Note b of Table 3.3.1-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ 4

~~Where the [LTSP] is not included in Table 3.3.1-1, the plant specific location for the [LTSP] or [NTSP] must be cited in Note b of Table 3.3.1-1. The brackets indicate plant specific terms may apply, as reviewed and approved by the NRC.~~

Nominal NTSP Reference 1

The ~~[Limiting~~ Trip Setpoint (~~LTSP~~)~~]~~ specified in ~~Table 3.3.1-1~~ is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[LTSP]~~ accounts for uncertainties in setting the channel (e.g., calibration), uncertainties in how the channel might actually perform (e.g., repeatability), changes in the point of action of the channel over time (e.g., drift during surveillance intervals), and any other factors which may influence its actual performance (e.g., harsh accident environments). In this manner, the ~~[LTSP]~~ ensures that SLs are not exceeded. Therefore, the ~~[LTSP]~~ meets the definition of an LSSS (Ref. ~~1~~ 2). NTSP 1 3 5 1

Technical Specifications contain values related to the OPERABILITY of equipment required for safe operation of the facility. OPERABLE is defined in Technical Specifications as "...being capable of performing its safety function(s)." Relying solely on the ~~[LTSP]~~ to define OPERABILITY in Technical Specifications would be an overly restrictive requirement if it were applied as an OPERABILITY limit for the "as-found" value of a protection channel setting during a Surveillance. This would result in Technical Specification compliance problems, as well as reports and corrective actions required by the rule which are not necessary to ensure safety. For example, an automatic protection channel with a setting that has been found to be different from the ~~[LTSP]~~ due to some drift of the setting may still be OPERABLE because drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the ~~[LTSP]~~ and thus the automatic protective action would still have ensured that the SL would not be exceeded with the "as-found" setting of the protection channel. Therefore, the channel would still be OPERABLE because it would have performed its safety function and the only corrective action required would be to reset the channel within the established as-left ~~tolerance~~ acceptance criteria band around the ~~[LTSP]~~ NTSP to account for further drift during the next surveillance interval. Note that, NTSP 3 5

BASES

BACKGROUND (continued)

acceptance criteria band

although the channel is OPERABLE under these circumstances, the trip setpoint must be left adjusted to a value within the as-left ~~tolerance~~ in accordance with uncertainty assumptions stated in the referenced setpoint methodology (as-left criteria), and confirmed to be operating within the statistical allowances of the uncertainty terms assigned (as-found criteria). 5

However, there is also some point beyond which the channel may not be able to perform its function due to, for example, greater than expected drift. This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value.

acceptance criteria band (e.g., conservative side of the as-found acceptance criteria band)

acceptance criteria band

If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found ~~tolerance band~~, the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[Nominal Trip Setpoint (~~NTSP~~)]~~ (within the allowed ~~tolerance~~), and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance. After the surveillance is completed, the channel as-found condition will be entered into the Corrective Action Program for further evaluation. 5 3

During AOOs, which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio (DNBR) shall be maintained above the SL value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System (RCS) pressure SL of ~~[~~2750~~]~~ psia shall not be exceeded. 3

Maintaining the parameters within the above values ensures that the offsite dose will be within the ~~10 CFR 50 (Ref. 2) and~~ 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) criteria during AOOs. 1

BASES

BACKGROUND (continued)

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) limits. Different accident categories allow a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event. 1

The RPS is segmented into four interconnected modules. These modules are:

- Measurement channels,
- Bistable trip units,
- RPS Logic, and
- Reactor trip circuit breakers (RTCBs).

This LCO addresses measurement channels and bistable trip units. It also addresses the automatic bypass removal feature for those trips with operating bypasses. The RPS Logic and RTCBs are addressed in LCO 3.3.~~3~~ 2, "Reactor Protective System (RPS) Logic and Trip Initiation." 1

The role of each of these modules in the RPS, including those associated with the logic and RTCBs, is discussed below.

<u>Measurement Channels</u>

Measurement channels, consisting of field transmitters or process sensors and associated instrumentation, provide a measurable electronic signal based upon the physical characteristics of the parameter being measured.

The excore nuclear instrumentation and the analog core protection calculators (CPCs) are considered components in the measurement channels. The wide range nuclear instruments (NIs) provide a Power Rate of Change - High Trip. Three RPS trips use a power level designated as Q power as an input. Q power is the higher of NI power and primary calorimetric power (ΔT power) based on RCS hot leg and cold leg temperatures. Trips using Q power as an input include the Variable ~~High~~ Level Power Trip (VHPT) - High, Thermal Margin/Low Pressure (TM/LP), and the ~~Axial~~ Local Power ~~Distribution (APD)~~ Density - High trips. 1

BASES

BACKGROUND (continued)

The analog CPCs provide the complex signal processing necessary to calculate the TM/LP trip setpoint, ~~APD~~ Local Power Density trip setpoint, VHPT trip setpoint, and Q power calculation. 1

The excore NIs (wide range and ~~power~~ linear range) and the analog CPCs (TM/LP and ~~APD~~ Local Power Density calculators) are mounted in the RPS cabinet, with one channel of each in each of the four RPS bays. 1

Four identical measurement channels, designated channels A through D, with electrical and physical separation are provided for each parameter used in the direct generation of trip signals. Measurement channels provide input to one or more RPS bistables within the same RPS channel. In addition, some measurement channels may also be used as inputs to Engineered Safety Features Actuation System (ESFAS) bistables, and most provide indication in the control room. Measurement channels used as an input to the RPS are never used for control functions.

When a channel monitoring a parameter exceeds a predetermined setpoint, indicating an unsafe condition, the bistable monitoring the parameter in that channel will trip. Tripping two or more channels of bistables monitoring the same parameter de-energizes the Matrix Logic, which in turn de-energizes the Initiation Logic. This causes all eight RTCBs to open, interrupting power to the control element assemblies (CEAs), allowing them to fall into the core. 7

Three of the four measurement and bistable channels are necessary to meet the redundancy and testability of GDC 21 in 10 CFR 50, Appendix A (Ref. ~~2~~ 3). The fourth channel provides additional flexibility by allowing one channel to be removed from service (trip channel bypass) for maintenance or testing while still maintaining a minimum two-out-of-three logic. Thus, even with a channel inoperable, no single additional failure in the RPS can either cause an inadvertent trip or prevent a required trip from occurring. 1

Since no single failure will either cause or prevent a protective system actuation, and no protective channel feeds a control channel, this arrangement meets the requirements of IEEE Standard 279-1971 (Ref. ~~4~~ 5). 1

Many of the RPS trips are generated by comparing a single measurement to a fixed bistable ~~[LTSP]~~ NTSP. Certain Functions, however, make use of more than one measurement to provide a trip. The following trips use multiple measurement channel inputs. 3

BASES

BACKGROUND (continued)

- Steam Generator Level - Low

  This trip uses the lower of the two steam generator levels as an input to a common bistable.

- Steam Generator Pressure - Low

  This trip uses the lower of the two steam generator pressures as an input to a common bistable.

- Variable ~~High~~ Level Power Trip (VHPT) - High 1

  The VHPT uses Q power as its only input. Q power is the higher of NI power and ΔT power. It has a trip setpoint that tracks power levels downward so that it is always within a fixed increment above current power, subject to a minimum value.

  On power increases, the trip setpoint remains fixed unless manually reset, at which point it increases to the new setpoint, a fixed increment above Q power at the time of reset, subject to a maximum value. Thus, during power escalation, the trip setpoint must be repeatedly reset to avoid a reactor trip.

- Thermal Margin/Low Pressure (TM/LP) and Steam Generator Pressure Difference

  Q power is only one of several inputs to the TM/LP trip. Other inputs include internal ASI and cold leg temperature based on the higher of two cold leg resistance temperature detectors. The TM/LP trip setpoint is a complex function of these inputs and represents a minimum acceptable RCS pressure to be compared to actual RCS pressure in the TM/LP trip unit.

  Steam generator pressure is also an indirect input to the TM/LP trip via the Steam Generator Pressure Difference. This Function provides a reactor trip when the secondary pressure in either steam generator exceeds that of the other generator by greater than a fixed amount. The trip is implemented by biasing the TM/LP trip setpoint upward so as to ensure TM/LP trip if an asymmetric steam generator transient is detected.

- ~~Axial Power Distribution (APD)~~ Local Power Density – High

  Q Power and ASI are inputs to the ~~APD~~ Local Power Density trip. The ~~APD~~ trip setpoint is a function of Q power, being more restrictive at higher power levels. It provides a reactor trip if actual ASI exceeds the ~~APD~~ Local Power Density trip setpoint. 1

BASES

BACKGROUND (continued)

Bistable Trip Units

Bistable trip units, mounted in the RPS cabinet, receive an analog input from the measurement channels, compare the analog input to trip setpoints, and provide contact output to the Matrix Logic. They also provide local trip indication and remote annunciation.

There are four channels of bistable trip units, designated A through D, for each RPS Function, one for each measurement channel. Bistable output relays de-energize when a trip occurs.

The contacts from these bistable relays are arranged into six coincidence matrices, comprising the Matrix Logic. If bistables monitoring the same parameter in at least two channels trip, the Matrix Logic will generate a reactor trip (two-out-of-four logic).

Some of the RPS measurement channels provide contact outputs to the RPS, so the comparison of an analog input to a trip setpoint is not necessary. In these cases, the bistable trip unit is replaced with an auxiliary trip unit. The auxiliary trip units provide contact multiplication so the single input contact opening can provide multiple contact outputs to the coincidence logic as well as trip indication and annunciation.

Trips employing auxiliary trip units include the Loss of Load trip and the ~~APD~~ Local Power Density - High trip. The Loss of Load trip is a contact input from the ~~Electro Hydraulic Control System~~ turbine generator control system hydraulic control oil pressure ~~on~~ from each of ~~the~~ four high pressure ~~stop valves~~ switches. 1

The ~~APD~~ Local Power Density trip, described above, is a complex function in which the actual trip comparison is performed within the CPC. Therefore the ~~APD~~ Local Power Density - High trip unit employs a contact input from the CPC. 1

All RPS trips, with the exception of the Loss of Load trip, generate a pretrip alarm as the trip setpoint is approached.

The trip setpoints used in the bistable trip units are based on the analytical limits stated in Reference ~~5~~ 6. The calculation of the ~~[LTSP]~~ NTSP specified in Table 3.3.1-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration ~~tolerances~~ acceptance criteria bands, instrumentation uncertainties, instrument drift, and severe environment errors - for those RPS channels that must function in harsh environments, as defined by 10 CFR 50.49 (Ref. ~~6~~ 7) - Allowable Values specified in Table 3.3.1-1, in the accompanying LCO,

BASES

BACKGROUND (continued)

are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in ~~the "Plant Protection System Selection of Trip Setpoint Values"~~ IC-3.17, "Instrument Setpoint Methodology for Nuclear Power Plants" (Ref. ~~7~~ 8). The trip setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value, to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the interval between surveillances. 1

The ~~[LTSP]~~ NTSP is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[LTSP]~~ NTSP value is the LSSS and ensures the safety analysis limits are met for the surveillance interval selected when a channel is adjusted based on stated channel uncertainties. 3

~~[LTSP~~ NTSPs~~]~~, in conjunction with the use of as-found and as-left ~~tolerances~~ acceptance criteria bands, consistent with the requirements of the Allowable Value will ensure that SLs of Chapter 2.0 are not violated during AOOs and the consequences of DBAs will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed. 3 5

Note that in the accompanying LCO 3.3.1, the Allowable Values of Table 3.3.1-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION or CHANNEL FUNCTIONAL TEST.

<u>RPS Logic</u>

The RPS Logic, addressed in LCO 3.3.~~3~~2, consists of both Matrix and Initiation Logic and employs a scheme that provides a reactor trip when bistables in any two out of the four channels sense the same input parameter trip. This is called a two-out-of-four trip logic. ~~This logic and the RTCB configuration are shown in Figure B 3.3.1-1.~~ 1 6

Bistable relay contact outputs from the four channels are configured into six logic matrices. Each logic matrix checks for a coincident trip in the same parameter in two bistable channels. The matrices are designated the AB, AC, AD, BC, BD, and CD matrices to reflect the bistable channels being monitored. Each logic matrix contains four normally energized matrix relays. When a coincidence is detected, consisting of a trip in the same Function in the two channels being monitored by the logic matrix, all four matrix relays de-energize.

BASES

BACKGROUND (continued)

The matrix relay contacts are arranged into trip paths, with one of the four matrix relays in each matrix opening contacts in one of the four trip paths. Each trip path provides power to one of the four normally energized RTCB control relays (K1, K2, K3, and K4). The trip paths thus each have six contacts in series, one from each matrix, and perform a logical OR function, opening the RTCBs if any one or more of the six logic matrices indicate a coincidence condition.

Each trip path is responsible for opening one set of two of the eight RTCBs. The RTCB control relays (K-relays), when de-energized, interrupt power to the breaker undervoltage trip attachments and simultaneously apply power to the shunt trip attachments on each of the two breakers. Actuation of either the undervoltage or shunt trip attachment is sufficient to open the RTCB and interrupt power from the motor generator (MG) sets to the control element drive mechanisms (CEDMs).

When a coincidence occurs in two RPS channels, all four matrix relays in the affected matrix de-energize. This in turn de-energizes all four RTCB control relays, which simultaneously de-energize the undervoltage and energize the shunt trip attachments in all eight RTCBs, tripping them open.

Matrix Logic refers to the matrix power supplies, trip channel bypass contacts, and interconnecting matrix wiring between bistable and auxiliary trip units, up to but not including the matrix relays. Contacts in the bistable and auxiliary trip units are excluded from the Matrix Logic definition, since they are addressed as part of the measurement channel.

The Initiation Logic consists of the trip path power source, matrix relays and their associated contacts, all interconnecting wiring, and solid state (auxiliary) relays through the K-relay contacts in the RTCB control circuitry.

It is possible to change the two-out-of-four RPS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by trip channel bypassing select portions of the Matrix Logic. Trip channel bypassing a bistable effectively shorts the bistable relay contacts in the three matrices associated with that channel. Thus, the bistables will function normally, producing normal trip indication and annunciation, but a reactor trip will not occur unless two additional channels indicate a trip condition. Trip channel bypassing can be simultaneously performed on

BASES

BACKGROUND (continued)

A mechanical interlock (key capture) in conjunction with administrative control

any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. ~~An interlock~~ prevents simultaneous trip channel bypassing of the same parameter in more than one channel. Trip channel bypassing is normally employed during maintenance or testing. 1

For those plants that have demonstrated sufficient channel to channel independence, two-out-of-three logic is the minimum that is required to provide adequate plant protection, since a failure of one channel still ensures a reactor trip would be generated by the two remaining OPERABLE channels. Two-out-of-three logic also prevents inadvertent trips caused by any single channel failure in a trip condition.

Zero Power Mode trips (Reactor Coolant Flow – Low and Thermal Margin/Low Pressure), Local Power Density - High, Loss of Load -High,

Local Power Density

In addition to the trip channel bypasses, there are also operating bypasses on select RPS trips. Some of these bypasses are enabled manually, others automatically, in all four RPS channels when plant conditions do not warrant the specific trip protection. All operating bypasses are automatically removed when enabling bypass conditions are no longer satisfied. Trips with operating bypasses include Power Rate of Change - High, ~~Reactor Coolant Flow - Low,~~ Steam Generator Pressure - Low, ~~APD - High, TM/LP,~~ and Steam Generator Pressure Difference. ~~[The Loss of Load trip, Power Rate of Change - High, and APD - High operating bypasses are automatically enabled and disabled.]~~ 1 3

The Variable Power Level – High bypass is manual enable but automatically disabled.

<u>Reactor Trip Circuit Breakers (RTCBs)</u>

2

The reactor trip switchgear, addressed in LCO 3.3.~~3 and shown in Figure B 3.3.1-1~~, consists of eight RTCBs, which are operated in four sets of two breakers (four channels). Power input to the reactor trip switchgear comes from two full capacity MG sets operated in parallel such that the loss of either MG set does not de-energize the CEDMs. There are two separate CEDM power supply buses, each bus powering half of the CEDMs. Power is supplied from the MG sets to each bus via two redundant paths (trip legs). Trip legs 1A and 1B supply power to CEDM bus 1. Trip legs 2A and 2B supply power to CEDM bus 2. This ensures that a fault or the opening of a breaker in one trip leg (i.e., for testing purposes) will not interrupt power to the CEDM buses. 6

Each of the four trip legs consists of two RTCBs in series. The two RTCBs within a trip leg are actuated by separate initiation circuits.

BASES

BACKGROUND (continued)

The eight RTCBs are operated as four sets of two breakers (four channels). For example, if a breaker receives an open signal in trip leg A (for CEDM bus 1), an identical breaker in trip leg B (for CEDM bus 2) will also receive an open signal. This arrangement ensures that power is interrupted to both CEDM buses, thus preventing trip of only half of the CEAs (a half trip). Any one inoperable breaker in a channel will make the entire channel inoperable.

Each set of RTCBs is operated by either a Manual Trip push button or an RPS actuated K-relay. There are four Manual Trip push buttons, arranged in two sets of two~~, as shown in Figure B 3.3.1-1~~. Depressing both push buttons in either set will result in a reactor trip. 6

When a Manual Trip is initiated using the control room push buttons, the RPS trip paths and K-relays are bypassed, and the RTCB undervoltage and shunt trip attachments are actuated independent of the RPS.

Manual Trip circuitry includes the push button and interconnecting wiring to both RTCBs necessary to actuate both the undervoltage and shunt trip attachments but excludes the K-relay contacts and their interconnecting wiring to the RTCBs, which are considered part of the Initiation Logic.

Functional testing of the entire RPS, from bistable input through the opening of individual sets of RTCBs, can be performed either at power or shutdown and is ~~normally~~ performed per the Surveillance Frequency Control Program ~~on a quarterly basis~~. 9 1 3
U FSAR, Section ~~[~~7.2~~]~~ (Ref. ~~8~~ 9), explains RPS testing in more detail.

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents and transients can be detected by one or more RPS Functions. The accident analysis contained in Reference ~~5~~ 6 takes credit for most RPS trip Functions. Functions not specifically credited in the accident analysis are part of the NRC approved licensing basis for the plant. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. Other Functions, such as the Loss of Load trip, are purely equipment protective, and their use minimizes the potential for equipment damage. 1

Permissive and interlock setpoints allow the blocking of trips during plant startups, and restoration of trips when the permissive conditions are not satisfied, but they are not explicitly modeled in the Safety Analyses. These permissives and interlocks ensure that the starting conditions are consistent with the safety analysis, before preventive or mitigating actions occur. Because these permissives or interlocks are only one of multiple conservative starting assumptions for the accident analysis, they are generally considered as nominal values without regard to measurement accuracy.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The specific safety analyses applicable to each protective Function are identified below:

1. <u>Variable ~~High~~ Power Level Trip (VHPT) - High</u>

   The VHPT provides reactor core protection against positive reactivity excursions that are too rapid for a Pressurizer Pressure - High or TM/LP trip to protect against. The following events require VHPT protection:

   - Uncontrolled CEA withdrawal event,
   - Excess load,
   - ~~Excess feedwater heat removal event,~~
   - CEA ejection event, and
   -
   - Main steam line break (MSLB) (~~outside containment~~ Backup Protection).

   The first ~~three~~ two events are AOOs, and fuel integrity is maintained. The ~~fourth and fifth~~ third and fourth are accidents, and limited fuel damage may occur. 1

2. <u>Power Rate of Change - High</u>

   The Power Rate of Change - High trip is used to trip the reactor when excore ~~[~~logarithmic~~]~~ power indicates an excessive rate of change. 3
   The Power Rate of Change - High Function ~~minimizes transients for events such as a continuous CEA withdrawal or a boron dilution event from low power levels~~ is not credited in the accident analysis as providing primary protection for any limiting case AOO or accident. 1 The trip may be bypassed when THERMAL POWER is < 1E-4% RTP, when poor counting statistics may lead to erroneous indication. ~~It is also~~ In addition, the trip is not required to be OPERABLE and is bypassed at > 15% RTP, where moderator temperature coefficient and fuel temperature coefficient make high rate of change of power unlikely. With the RTCBs open, the Power Rate of Change - High trip is not required to be OPERABLE; however, the indication ~~and alarm~~ Function~~s~~ of at least two channels ~~are~~ is required by LCO 3.3.1~~2~~1, "~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring ~~Channels~~," to be OPERABLE. 3 1 LCO 3.3.1~~3~~1 ensures the ~~[~~logarithmic~~]~~ channels are available to detect ~~and alert the operator to~~ a boron dilution event. 3 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

3. Reactor Coolant Flow - Low

The Reactor Coolant Flow - Low trip provides protection during the following events:

- Loss of RCS flow,
- Loss of ~~nonemergency~~ AC power, and
- Reactor coolant pump (RCP) seized/sheared shaft~~,~~
- ~~RCP sheared shaft, and~~
- ~~Certain MSLB events~~.

The loss of RCS flow and ~~of nonemergency~~ AC power events are AOOs where fuel integrity is maintained. The RCP seized shaft~~,~~ and sheared shaft~~, and MSLBs~~ are accidents where fuel damage may result.

4. Pressurizer Pressure - High

The Pressurizer Pressure - High trip, in conjunction with pressurizer safety valves and main steam safety valves (MSSVs), provides protection against overpressure conditions in the RCS during the following events:

- ~~Loss of condenser vacuum with a concurrent loss of offsite power,~~
- ~~Loss of condenser vacuum with a concurrent loss of one 6.9 kV bus~~,
- ~~Isolation of turbine at 102% power~~ Loss of External Load/Turbine trip,
- ~~Feedwater System pipe breaks between the steam generator and check valve~~,
- CEA withdrawal, and
- Loss of feedwater flow.

1

BASES

APPLICABLE SAFETY ANALYSES (continued)

5. Containment Pressure - High

The Containment Pressure - High trip prevents exceeding the containment design pressure during certain loss of coolant accidents (LOCAs) or feedwater line break accidents. It ensures a reactor trip prior to, or concurrent with, a LOCA, thus assisting the ESFAS in the event of a LOCA or MSLB. Since these are accidents, SLs may be violated. However, the consequences of the accident will be acceptable.

6. Steam Generator Pressure - Low

The Steam Generator Pressure - Low trip provides protection against an excessive rate of heat extraction from the steam generators, which would result in a rapid uncontrolled cooldown of the RCS. This trip is needed to shut down the reactor and assist the ESFAS in the event of an MSLB. Since these are accidents, SLs may be violated. However, the consequences of the accident will be acceptable.

7.a, 7.b. Steam Generator A and B Level - Low

The Steam Generator A Level - Low and Steam Generator B Level - Low trips are required for the following events:

- ~~Steam System piping failures,~~
- Feedwater System pipe breaks,
- Excess Load ~~Inadvertent opening of a steam generator atmospheric dump valve (ADV),~~ 1
- Loss of normal feedwater, and
- Asymmetric loss of feedwater.

The Steam Generator Level - Low trip ensures that low DNBR, high local power density, and the RCS pressure SLs are maintained during normal operation and AOOs, and, in conjunction with the ESFAS, the consequences of the Feedwater System pipe break accident will be acceptable.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Local Power Density

8. ~~Axial Power Distribution (APD)~~ - High 1

The ~~APD~~ - High trip ensures that excessive axial peaking, such as that due to axial xenon oscillations, will not cause fuel damage. It ensures that neither a DNBR less than the SL nor a peak linear heat rate that corresponds to the temperature for fuel centerline melting will occur. This trip is the primary protection against fuel centerline melting.

9. Thermal Margin

a. Thermal Margin/Low Pressure (TM/LP)

The TM/LP trip prevents exceeding the DNBR SL during AOOs and aids the ESFAS during certain accidents. The following events require TM/LP protection:

- Excess load (inadvertent opening of a steam generator ADV),
- RCS depressurization (inadvertent safety ~~or power operated relief~~ valve~~s~~ ~~(PORVs)~~ opening), 1
- Steam generator tube rupture, and
- LOCA accident.

The first two events are AOOs, and fuel integrity is maintained. The third and fourth are accidents, and limited fuel damage may occur although only the LOCA is expected to result in fuel damage. The trip is initiated whenever the RCS pressure signal drops below a minimum value (P_{min}) or a computed value (P_{var}) as described below, whichever is higher. The computed value is a Function Q power, ASI, as determined from the axially split

and

excore detectors~~,~~ reactor inlet (cold leg) temperature~~, and the number of RCPs operating~~. 1

azimuthal tilt

The minimum value of reactor coolant flow rate, the maximum ~~T_Q~~, and the maximum CEA deviation permitted for continuous operation are assumed in the generation of this trip Function. In addition, CEA group sequencing in accordance with LCO 3.1.6, "Regulating Control Element Assembly (CEA) Insertion Limits," is assumed. Finally, the maximum insertion of CEA banks that can occur during any AOO prior to a VHPT is assumed. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

b. Steam Generator Pressure Difference

The Steam Generator Pressure Difference provides protection for those AOOs associated with secondary system malfunctions that result in asymmetric primary coolant temperatures. The most limiting event is closure of a single main steam isolation valve. Steam Generator Pressure Difference is provided by comparing the secondary pressure in both steam generators in the TM/LP calculator. If the pressure in either exceeds that in the other by the trip setpoint, a TM/LP trip will result.

10. Loss of Load

The Loss of Load ~~(~~turbine ~~stop valve (TSV)~~ control oil pressure) trip is anticipatory for the loss of heat removal capabilities of the secondary system following a turbine trip. The Loss of Load trip prevents lifting the pressurizer safety valves, PORVs, and MSSVs in the event of a turbine generator trip. Thus, the trip minimizes the pressure and temperature transients on the reactor by initiating a trip well before reaching the Pressurizer Pressure - High trip and pressurizer safety valve setpoints. The four RPS Loss of Load reactor trip channels receive their input from ~~sensors mounted on the high pressure TSV actuators. Since there are four high pressure TSVs, one actuator per valve and one sensor per actuator, each sensor sends its signal to a different RPS channel. When the turbine trips, control oil is dumped from the high pressure TSVs. When the control oil pressure drops to the appropriate setpoint, a reactor trip signal is generated.~~ four redundant pressure switches mounted on the emergency trip fluid line common header, to serve as the loss of load, turbine trip input to the Reactor Protective System logic matrices. Actuation of any two of the pressure switches on low hydraulic oil pressure causes a reactor trip. 1

Interlocks/Bypasses

The bypasses and their Allowable Values are addressed in footnotes to Table 3.3.1-1. They are not otherwise addressed as specific Table entries.

The automatic bypass removal features must function as a backup to manual actions for all safety related trips to ensure the trip Functions are not operationally bypassed when the safety analysis assumes the Functions are not bypassed. The RPS operating bypasses are:

Zero power mode bypass (ZPMB) removal on the TM/LP, Steam Generator Pressure Difference, and reactor coolant low flow trips when THERMAL POWER is < 1E-4% RTP. This bypass is manually enabled below the specified setpoint to permit low power testing. The wide range NI Level 1 bistable in the wide range drawer permits manual bypassing below the setpoint and removes the bypass above the setpoint.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Power rate of change bypass removal. The Power Rate of Change - High trip is automatically bypassed at < 1E-4% RTP, as sensed by the wide range NI Level 2 bistable, and at > ~~12~~ 15% RTP by the power range NI Level 1 bistable, mounted in their respective NI drawers. Automatic bypass removal is also effected by these bistables when conditions are no longer satisfied. 1

Loss of Load and ~~APD~~ Local Power Density - High bypass removal. The Loss of Load and ~~APD~~ Local Power Density - High trips are automatically bypassed when at < 15% RTP as sensed by the power range NI Level 1 bistable. The bypass is automatically removed by this bistable above the setpoint. This same bistable is used to bypass the Power Rate of Change - High trip. 1

Steam Generator Pressure - Low bypass removal. The Steam Generator Pressure - Low trip is manually enabled below the pretrip setpoint. The permissive is removed, and the bypass automatically removed, when the Steam Generator Pressure - Low pretrip clears.

The RPS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires all instrumentation performing an RPS Function to be OPERABLE. Failure of any required portion of the instrument channel renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. The specific criteria for determining channel OPERABILITY differ slightly between Functions. These criteria are discussed on a Function by Function basis below.

Actions allow maintenance (trip channel) bypass of individual channels, but ~~the bypass activates interlocks that prevent~~ operation with a second channel in the same Function bypassed is prevented. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). ~~At plants where adequate channel to channel independence has been demonstrated, specific exceptions may be approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~ 1 1

Allowable Values for RPS Instrumentation Functions are specified in Table 3.3.1-1. ~~[LTSPs]~~ NTSPs and the methodologies for calculation of the as-left and as-found ~~tolerances~~ acceptance criteria are described in ~~[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. The ~~[LTSPs]~~ NTSPs are selected to ensure that the actual setpoints remain conservative with respect to the as-found ~~tolerance~~ band between successive CHANNEL CALIBRATIONS. After each calibration the trip setpoint shall be left within the as-left band around the ~~[LTSP]~~ NTSP. 3 5

BASES

LCO (continued)

The following Bases for each trip Function identify the above RPS trip Function criteria items that are applicable to establish the trip Function OPERABILITY.

Level

1. Variable ~~High~~ Power Trip (VHPT) - High 1

This LCO requires all four channels of the VHPT to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to provide an operating envelope that prevents unnecessary Linear Power Level - High reactor VHPT - High trips during normal plant operations. The Allowable Value is low enough for the system to maintain a margin to unacceptable fuel cladding damage should a CEA ejection accident occur.

The VHPT setpoint is operator adjustable and can be set at a fixed increment above the indicated THERMAL POWER level. Operator action is required to increase the trip setpoint as THERMAL POWER is increased. The trip setpoint is automatically decreased as THERMAL POWER decreases. The ~~[LTSP]~~ NTSP has a maximum and a minimum setpoint. 3

Adding to this maximum value the possible variation in ~~[LTSP]~~ NTSP due to calibration and instrument errors, the maximum actual steady state THERMAL POWER level at which a trip would be actuated is ~~112~~ 107% RTP~~, which is the value used in the safety analyses~~. 3

~~To account for these errors, the safety analysis minimum value is 40% RTP. The 10% step is a maximum value assumed in the safety analysis. There is no uncertainty applied to the step.~~ 1

2. Power Rate of Change - High

This LCO requires four channels of Power Rate of Change - High to be OPERABLE in MODE 1 with THERMAL POWER ≤ 15% RTP and MODE 2 ~~MODES 1 and 2, as well as in MODES 3, 4, and 5 when the RTCBs are closed and the CEA Drive System is capable of CEA withdrawal~~. 1

The high power rate of change trip serves as a backup to the administratively enforced startup rate limit. The Function is not credited in the accident analyses; therefore, the Allowable Value for the trip or bypass Functions is not derived from analytical limits.

BASES

LCO (continued)

3. Reactor Coolant Flow - Low

This LCO requires four channels of Reactor Coolant Flow - Low to be OPERABLE in MODES 1 and 2.

The trip may be manually bypassed when THERMAL POWER falls below ~~1E-4~~ 1 % RTP. This bypass is part of the ZPMB circuitry, which also bypasses the TM/LP trip and provides a ΔT power block signal to the Q power select logic. This ZPMB allows low power physics testing at reduced RCS temperatures and pressures. It also allows heatup and cooldown with shutdown CEAs withdrawn.

This trip is set high enough to maintain fuel integrity during a loss of flow condition. The setting is low enough to allow for normal operating fluctuations from offsite power. ~~To account for analysis uncertainty, the value in the safety analysis is 93% RTP.~~

4. Pressurizer Pressure - High

This LCO requires four channels of Pressurizer Pressure - High to be OPERABLE in MODES 1 and 2.

The Allowable Value is set high enough to allow for pressure increases in the RCS during normal operation (i.e., plant transients) not indicative of an abnormal condition. The setting is below the lift setpoint of the pressurizer safety valves and low enough to initiate a reactor trip when an abnormal condition is indicated. ~~The difference between the Allowable Value and the analysis setpoint of 2470 psia includes allowance for harsh environment.~~ 1

The Pressurizer Pressure - High trip concurrent with PORV operation avoids unnecessary operation of the pressurizer safety valves.

5. Containment Pressure - High

This LCO requires four channels of Containment Pressure - High to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) that are not indicative of an abnormal condition. The setting is low enough to initiate a reactor trip to prevent containment pressure from exceeding design pressure following a DBA.

BASES

LCO (continued)

6. Steam Generator Pressure - Low

This LCO requires four channels of Steam Generator Pressure - Low per steam generator to be OPERABLE in MODES 1 and 2.

The Allowable Value is sufficiently below the full load operating value for steam pressure so as not to interfere with normal plant operation, but still high enough to provide the required protection in the event of excessive steam demand. Since excessive steam demand causes the RCS to cool down, resulting in positive reactivity addition to the core, a reactor trip is required to offset that effect.

~~The difference between the Allowable Value and the safety analysis value of 600 psia includes harsh environment uncertainties.~~ 1

The Function may be manually bypassed as steam generator pressure is reduced during controlled plant shutdowns. This bypass is permitted at a preset steam generator pressure. The bypass, in conjunction with the ZPMB, allows testing at low temperatures and pressures, and heatup and cooldown with the shutdown CEAs withdrawn. From a bypass condition the trip will be reinstated automatically as steam generator pressure increases above the preset pressure.

7.a, 7.b. Steam Generator Level – Low

This LCO requires four channels of Steam Generator Level - Low per steam generator to be OPERABLE in MODES 1 and 2.

The Allowable Value is sufficiently below the normal operating level for the steam generators so as not to cause a reactor trip during normal plant operations. The trip setpoint is high enough to ensure a reactor trip signal is generated before water level drops below the top of the feed ring~~. The difference between the Allowable Value and the measurement value includes 10 inches of measurement uncertainty. The specified setpoint ensures there will be sufficient water inventory to provide a 10 minute margin before auxiliary feedwater is required for the removal of decay heat.~~ 1

BASES

LCO (continued)

8. ~~Axial Power Distribution (APD)~~ Local Power Density - High

This LCO requires four channels of ~~APD~~ Local Power Density - High to be OPERABLE in MODE 1 ≥ 15% RTP.

The Allowable Value curve was derived from an analysis of many axial power shapes with allowances for instrumentation inaccuracies and the uncertainty associated with the excore to incore ASI relationship. 1

The ~~APD~~ Local Power Density trip is automatically bypassed at < 15% RTP, where it is not required for reactor protection.

9. Thermal Margin

a. Thermal Margin/Low Pressure (TM/LP)

This LCO requires four channels of TM/LP to be OPERABLE in MODES 1 and 2.

The Allowable Value includes allowances for equipment response time, measurement uncertainties, processing error, and a further allowance to compensate for the time delay associated with providing effective termination of the occurrence that exhibits the most rapid decrease in margin to the SL.

This trip may be manually bypassed when THERMAL POWER falls below ~~1E-4~~ 1% RTP. This bypass is part of the ZPMB circuitry, which also bypasses the Reactor Coolant Flow - Low trip and provides a ΔT power block signal to the Q power select logic. This ZPMB allows low power physics testing at reduced RCS temperatures and pressures. It also allows heatup and cooldown with shutdown CEAs withdrawn. 1

b. Steam Generator Pressure Difference

This LCO requires four channels of Steam Generator Pressure Difference to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to avoid trips caused by normal operation and minor transients, but ensures DNBR protection in the event of Design Basis Events. ~~The difference between the Allowable Value and the 175 psia analysis setpoint allows for 40 psia of measurement uncertainty.~~ 1

BASES

LCO (continued)

The trip may be bypassed when THERMAL POWER falls below ~~1E-4~~ 1% RTP. The Steam Generator Pressure Difference is subject to the ZPMB, since it is an input to the TM/LP trip and is not required for protection at low power levels. 1

10. Loss of Load

The LCO requires four Loss of Load trip channels to be OPERABLE in MODE 1 ≥ 15% RTP.

The Loss of Load trip may be bypassed when THERMAL POWER falls below 15%, since it is no longer needed to prevent lifting of the pressurizer safety valves, steam generator safety valves, or PORVs in the event of a Loss of Load. The Nuclear Steam Supply System and the Steam Dump System are capable of accommodating the Loss of Load without requiring the use of the above equipment.

Interlocks/Bypasses

The LCO on bypass permissive removal channels requires that the automatic bypass removal feature of all four operating bypass channels be OPERABLE for each RPS Function with an operating bypass in the MODES addressed in the specific LCO for each Function. All four bypass removal channels must be OPERABLE to ensure that none of the four RPS channels are inadvertently bypassed.

The LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The interlock Allowable Values are based on analysis requirements for the bypassed functions. These are discussed above as part of the LCO discussion for the affected Functions.

APPLICABILITY

This LCO is applicable in accordance with Table 3.3.1-1. Most RPS trips are required to be OPERABLE in MODES 1 and 2 because the reactor is critical in these MODES. The trips are designed to take the reactor subcritical, maintaining the SLs during AOOs and assisting the ESFAS in providing acceptable consequences during accidents. Exceptions are addressed in footnotes to the table. Exceptions to this APPLICABILITY are:

- The ~~APD~~ Local Power Density - High Trip and Loss of Load are only applicable in MODE 1 ≥ 15% RTP because they may be automatically bypassed at < 15% RTP, where they are no longer needed. 1

BASES

APPLICABILITY (continued)

- ~~The Power Rate of Change - High trip, RPS Logic, RTCBs, and Manual Trip are also required in MODES 3, 4, and 5, with the RTCBs closed, to provide protection for boron dilution and CEA withdrawal events. The Power Rate of Change - High trip in these lower MODES is addressed in LCO 3.3.2, "Reactor Protective System (RPS) Instrumentation - Shutdown." The RPS Logic in MODES 1, 2, 3, 4, and 5 is addressed in LCO 3.3.3.~~ 1

The RPS ~~Most~~ trips are not required to be OPERABLE in MODES 3, 4, and 5. In MODES 3, 4, and 5, the emphasis is placed on return to power events. The reactor is protected in these MODES by ensuring adequate SDM.

ACTIONS

The most common causes of channel inoperability are outright failure or drift of the bistable or process module sufficient to exceed the ~~tolerance~~ acceptance criteria band allowed by the plant specific setpoint analysis. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it to within specification. If the trip setpoint is nonconservative with respect to the Allowable Value in Table 3.3.1-1, the channel is declared inoperable immediately, and the appropriate Condition(s) must be entered immediately. 5

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is not functioning as required, or the transmitter, instrument loop, signal processing electronics, or RPS bistable trip unit is found inoperable, then all affected Functions provided by that channel must be declared inoperable, and the plant must enter the Condition for the particular protection Function affected.

When the number of inoperable channels in a trip Function exceeds that specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

A Note has been added to the ACTIONS to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function. The Completion Times of each inoperable Function will be tracked separately for each Function, starting from the time the Condition was entered.

BASES

ACTIONS (continued)

A.1, A.2.1, and A.2.2

Condition A applies to the failure of a single channel in any RPS automatic trip Function. RPS coincidence logic is normally two-out-of-four.

If one RPS bistable trip unit or associated instrument channel is inoperable, startup or power operation is allowed to continue, providing the inoperable trip unit is placed in bypass or trip within 1 hour (Required Action A.1). With one channel in bypass, no additional random failure of a single channel could spuriously trip the reactor and a valid trip signal can still trip the reactor. With one channel in trip, an additional random failure of a single channel could spuriously trip the reactor. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to restore, bypass, or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel while ensuring that the risk involved in operating with the failed channel is acceptable.

The failed channel is restored to OPERABLE status or is placed in trip within ~~[~~48~~]~~ hours ~~[or in accordance with the Risk Informed Completion Time Program]~~ (Required Action A.2.1 or Required Action A.2.2). Required Action A.2.1 restores the full capability of the Function.

~~[~~ Required Action A.2.2 places the Function in a one-out-of-three configuration. In this configuration, common cause failure of dependent channels cannot prevent trip. ~~]~~

The Completion Time of ~~[~~48~~]~~ hours is based on operating experience, which has demonstrated that a random failure of a second channel occurring during the ~~[~~48~~]~~ hour period is a low probability event. 3

B.1 and B.2

Condition B applies to the failure of two channels in any RPS automatic trip Function.

Required Action B.1 provides for placing one inoperable channel in bypass and the other channel in trip within the Completion Time of 1 hour. This Completion Time is sufficient to allow the operator to take all appropriate actions for the failed channels while ensuring that the risk involved in operating with the failed channels is acceptable. With one channel of protective instrumentation bypassed, the RPS is in a two-out-of-three logic; but with another channel failed, the RPS may be operating

BASES

ACTIONS (continued)

in a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the RPS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, the reactor will trip.

One channel should be restored to OPERABLE status within ~~[~~48~~]~~ hours ~~[or in accordance with the Risk Informed Completion Time Program]~~ for reasons similar to those stated under Condition A. After one channel is restored to OPERABLE status, the provisions of Condition A still apply to the remaining inoperable channel. Therefore, the channel that is still inoperable after completion of Required Action B.2 must be placed in trip if more than ~~[~~48~~]~~ hours have elapsed since the initial channel failure. 3

C.1 and C.2

The excore detectors are used to generate the internal ASI used as an input to the TM/LP and Local Power Density ~~APD~~ - High trips. Incore detectors provide a more accurate measurement of ASI. If one or more excore detectors cannot be calibrated to match incore detectors, power is restricted or reduced during subsequent operations because of increased uncertainty associated with using uncalibrated excore detectors. 3

The Completion Time of 24 hours is adequate to perform the SR while minimizing the risk of operating in an unsafe condition.

D.1, D.2.1, D.2.2.1, and D.2.2.2

Condition D applies to one automatic bypass removal channel inoperable. If the bypass removal channel for any operating bypass cannot be restored to OPERABLE status, the associated RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected RPS channel must be declared inoperable, as in Condition A, and the bypass either removed or the bypass removal channel repaired. The Bases for Required Actions and Completion Times are the same as discussed for Condition A.

E.1, E.2.1, and E.2.2

Condition E applies to two inoperable automatic bypass removal channels. If the bypass removal channels cannot be restored to OPERABLE status, the associated RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected

BASES

ACTIONS (continued)

RPS channels must be declared inoperable, as in Condition B, and the bypass either removed or the bypass removal channel repaired. Also, Required Action E.2.2 provides for the restoration of the one affected automatic trip channel to OPERABLE status within the rules of Completion Time specified under Condition B. Completion Times are consistent with Condition B.

F.1

Condition F is entered when the Required Action and associated Completion Time of Conditions A, B, C, D, or E are not met for the ~~Axial Power Distribution~~ Local Power Density and Loss of Load Trip Functions. 1

If the Required Actions associated with these Conditions cannot be completed within the required Completion Times, the reactor must be brought to a MODE in which the Required Actions do not apply. The allowed Completion Time of 6 hours to reduce THERMAL POWER to < 15% RTP is reasonable, based on operating experience, to decrease power to < 15% RTP from full power conditions in an orderly manner and without challenging plant systems.

G.1

Condition G is entered when the Required Action and associated Completion Time of Conditions A, B, C, D, E, or F are not met.

If the Required Actions associated with these Conditions cannot be completed within the required Completion Times, the reactor must be brought to a MODE in which the Required Actions do not apply. The allowed Completion Time of 6 hours to be in MODE 3 is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The SRs for any particular RPS Function are found in the SR column of Table 3.3.1-1 for that Function. Most Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION, and response time testing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~In order for a plant to take credit for topical reports as the basis for justifying Frequencies, topical reports must be supported by an NRC staff SER that establishes the acceptability of each topical report for that plant (Ref. 9).~~

~~-----REVIEWER'S NOTE-----~~
~~Notes a and b are applied to the setpoint verification Surveillances for each RPS Instrumentation – Operating (Analog) Function in Table 3.3.1-1 unless one or more of the following exclusions apply:~~

~~1. Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~

~~2. Settings associated with safety relief valves are excluded. The performance of these components is already controlled (i.e., trended with as-left and as-found limits) under the ASME Code for Operation and Maintenance of Nuclear Power Plants testing program.~~

~~3. Functions and Surveillance Requirements which test only digital components are normally excluded. There is no expected change in result between SR performances for these components. Where separate as-left and as-found tolerance is established for digital component SRs, the requirements would apply.~~

3

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 transmitter or the signal processing equipment has drifted outside its limits.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

SR 3.3.1.2

A daily calibration (heat balance) is performed when THERMAL POWER is ≥ 15 ~~20~~%. The daily calibration shall consist of adjusting the "nuclear power calibrate" potentiometers to agree with the calorimetric calculation 1 ~~if the absolute difference is > 1.5%~~. The "ΔT power calibrate" 1 potentiometers are then used to null the "nuclear power - ΔT power" indicators on the RPS Reactor Power Calibration and Indication panel. Performance of the daily calibration ensures that the two inputs to the Q power measurement are indicating accurately with respect to the much more accurate secondary calorimetric calculation.

~~[The Frequency of 24 hours is based on plant operating experience and takes into account indications and alarms located in the control room to detect deviations in channel outputs.~~ 3

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----~~ ~~]~~ 4 3

15 The Frequency is modified by a Note indicating this Surveillance must be performed within 12 hours after THERMAL POWER is ≥ ~~20~~% RTP. The secondary calorimetric is inaccurate at lower power levels. The 12 hours allows time requirements for plant stabilization, data taking, and instrument calibration. 1

A second Note indicates the daily calibration may be suspended during PHYSICS TESTS. This ensures that calibration is proper preceding and following physics testing at each plateau, recognizing that during testing, changes in power distribution and RCS temperature may render the calorimetric inaccurate.

SR 3.3.1.3

It is necessary to calibrate the excore power range channel upper and lower subchannel amplifiers such that the internal ASI used in the TM/LP and Local Power Density ~~APD~~ - High trips reflects the true core power distribution as determined by the incore detectors. A Note to the Frequency indicates the Surveillance is required within 12 hours after THERMAL POWER is ≥ 15 ~~[20]~~% RTP. Uncertainties in the excore and incore measurement process make it impractical to calibrate when THERMAL POWER is < 15 ~~[20]~~% RTP. The Completion Time of 12 hours allows time for plant stabilization, data taking, and instrument calibration. If the excore detectors are not properly calibrated to agree with the incore detectors, power is restricted during subsequent operations because of increased uncertainty associated with using uncalibrated excore detectors. ~~[The 31 day Frequency is adequate, based on operating experience of the excore linear amplifiers and the slow burnup of the detectors. The excore readings are a strong function of the power produced in the peripheral fuel bundles and do not represent an integrated reading across the core. Slow changes in neutron flux during the fuel cycle can also be detected at this Frequency.~~ 1 3

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---~~] 4 3

SR 3.3.1.4

A CHANNEL FUNCTIONAL TEST is performed on each RPS instrument channel, except Loss of Load and Power Rate of Change to ensure the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

In addition to power supply tests, The RPS CHANNEL FUNCTIONAL TEST consists of three overlapping tests as described in Reference ~~8~~ 9. These tests verify that the RPS is capable of performing its intended function, from bistable input through the RTCBs. They include: 1

Bistable Tests

The bistable setpoint must be found to trip conservative with respect to the Allowable Values specified in the LCO and left set consistent with the assumptions of the plant specific setpoint analysis (Ref. ~~7~~ 8). As-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference 10.

A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified ~~tolerance~~ acceptance criteria around the setpoint. This is done with the affected RPS channel trip channel bypassed. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis. 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and~~/or~~ Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band ~~-~~of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable. 5 3 5 1 3 5

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 3 5

<u>Matrix Logic Tests</u>

Matrix Logic tests are addressed in LCO 3.3.~~3~~2. This test is performed one matrix at a time. It verifies that a coincidence in the two input channels for each Function removes power from the matrix relays. During testing, power is applied to the matrix relay test coils and prevents the matrix relay contacts from assuming their de-energized state. This test will detect any short circuits around the bistable contacts in the coincidence logic, such as may be caused by faulty bistable relay or trip channel bypass contacts. 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trip Path Tests

2

Trip Path (Initiation Logic) tests are addressed in LCO 3.3.~~3~~. These tests are similar to the Matrix Logic tests, except that test power is withheld from one matrix relay at a time, allowing the initiation circuit to de-energize, opening the affected set of RTCBs. The RTCBs must then be closed prior to testing the other three initiation circuits, or a reactor trip may result. 1

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 10).~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

SR 3.3.1.5

A CHANNEL CALIBRATION of the excore power range channels ensures that the channels are reading accurately and within acceptance criteria band ~~tolerance~~. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis. 5

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference ~~[~~10~~]~~. 3

A Note is added stating that the neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by

BASES

SURVEILLANCE REQUIREMENTS (continued)

performing the ~~daily~~ calorimetric calibration (SR 3.3.1.2) and the ~~monthly~~ 1 linear subchannel gain check (SR 3.3.1.3). In addition, associated control room indications are continuously monitored by the operators.

~~[The Frequency of 92 days is acceptable, based on plant operating experience, and takes into account indications and alarms available to the operator in the control room.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

SR 3.3.1.5 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found acceptance criteria band ~~tolerance~~ but conservative with respect to the Allowable Value. 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~. 5 Where a setpoint more conservative than the NTSP ~~[LTSP]~~ is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found acceptance criteria bands ~~tolerances~~, as applicable, 5 3 will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~, then the channel shall be declared inoperable. 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria band be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 3 5

SR 3.3.1.6

A CHANNEL FUNCTIONAL TEST on the Loss of Load and Power Rate of Change channels is performed prior to a reactor startup to ensure the entire channel will perform its intended function if required. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. ~~The Loss of Load pressure sensor cannot be tested during reactor operation without closing the high pressure TSV, which would result in a turbine trip or reactor trip. The Power Rate of Change - High trip Function is required during startup operation and is bypassed when shut down or > 15% RTP.~~ 1

SR 3.3.1.6 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value. 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable. 5 5 3 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

NTSP

acceptance criteria bands

The second Note also requires that ~~[LTSP]~~ and the methodologies for calculating the as-left and the as-found ~~tolerances~~ be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. 3 5

the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively

SR 3.3.1.7

SR 3.3.1.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.1.4, except SR 3.3.1.7 is applicable only to bypass Functions and is performed once within 92 days prior to each startup. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Proper operation of bypass permissives is critical during plant startup because the bypasses must be in place to allow startup operation and must be removed at the appropriate points during power ascent to enable certain reactor trips. Consequently, the appropriate time to verify bypass removal function OPERABILITY is just prior to startup. The allowance to conduct this test within 92 days of startup is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 10). Once the operating bypasses are removed, the bypasses must not fail in such a way that the associated trip Function gets inadvertently bypassed. This feature is verified by the trip Function CHANNEL FUNCTIONAL TEST, SR 3.3.1.4. Therefore, further testing of the bypass function after startup is unnecessary.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a CHANNEL CALIBRATION.

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference ~~[~~10~~]~~. 3

SR 3.3.1.8 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition.

The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP~~] NTSP. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable. 5 5 3 5

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 5 3

~~[The Frequency is based upon the assumption of an 18 month calibration interval for the determination of the magnitude of equipment drift.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 4

The Surveillance is modified by a Note to indicate that the neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by performing the calorimetric calibration (SR 3.3.1.2) and the linear subchannel gain check (SR 3.3.1.3).

SR 3.3.1.9

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. ~~[Response times are conducted on an [18] month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 18 months, where n is the number of channels in the function. The Frequency of [18] months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 4 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

Testing may be performed in one measurement or in overlapping segments, with verification that all components are tested.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following TS Bases are applicable to plants adopting CEOG Topical Report CE NPSD-1167-1, "Elimination of Pressure Sensor Response Time Testing Requirements," and the methodology contained in Attachment 1 to TSTF-569.~~
~~--~~

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 11) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. The response time may be verified for components that replace the components that were previously evaluated in Ref. 11 provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 12). Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration (SR 3.3.1.2).

REFERENCES

1. Technical Requirements Manual (TRM)

~~1~~ 2. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation."

~~2~~ 3. 10 CFR 50, Appendix A, GDC 21.

~~3~~ 4. 10 CFR ~~100~~ 50.67.

~~4~~ 5. IEEE Standard 279-1971, April 5, 1972.

BASES

REFERENCES (continued)

6 ~~5~~. FSAR, Chapter ~~[14]~~. 3
U 15

7 ~~6~~. 10 CFR 50.49.

IC-3.17, "Instrument Setpoint Methodology for Nuclear Power Plants"

8 ~~7~~. ~~"Plant Protection System Selection of Trip Setpoint Values."~~ 1

9 ~~8~~. FSAR, Section ~~[~~7.2~~]~~. 3
U

~~9. NRC Safety Evaluation Report, [Date].~~

10. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

11. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

12. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing."

BASES

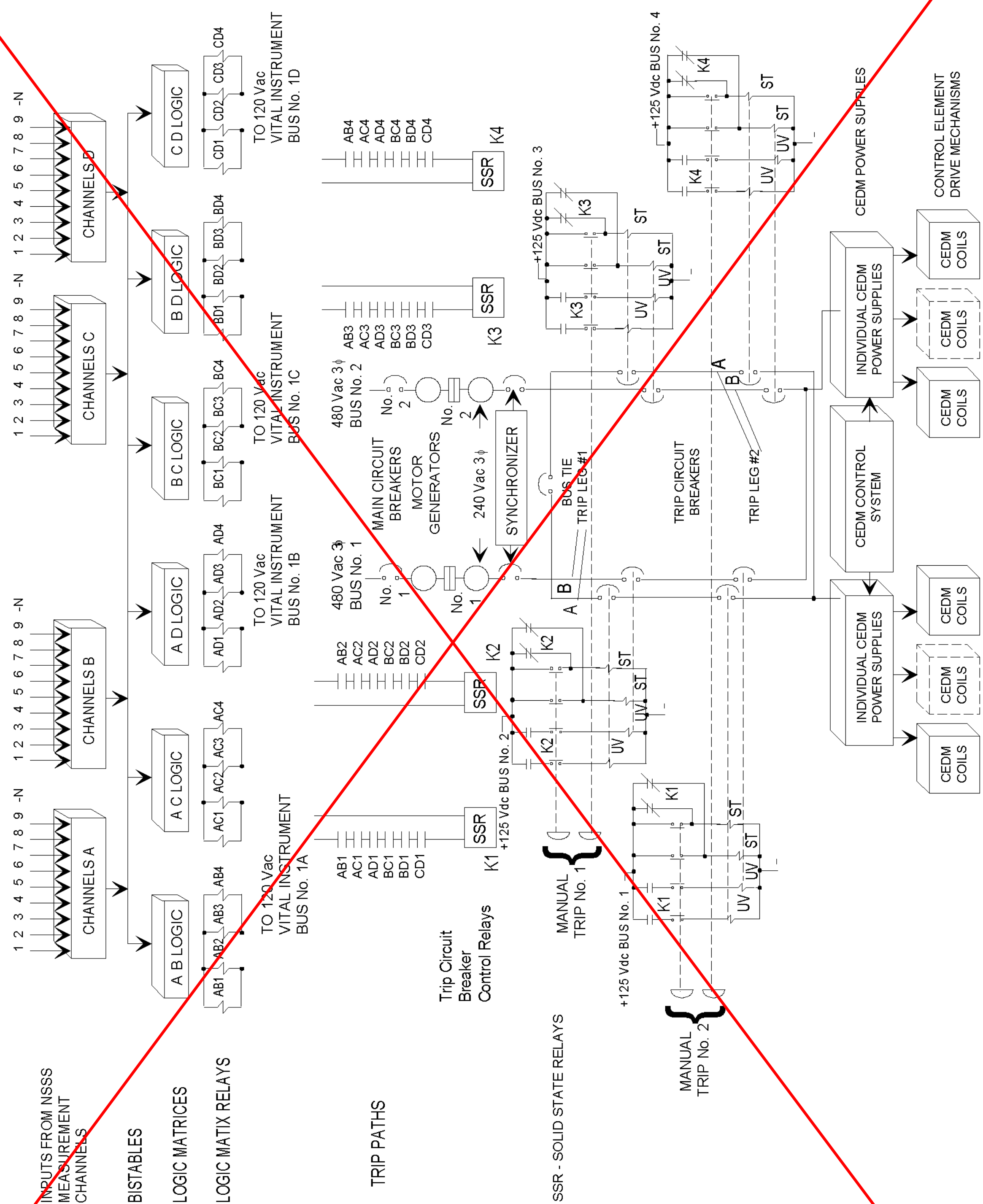

Figure B 3.3.1-1 (page 1 of 1)
Functional Diagram of the Two-Out-of-Four Logic and RTCB Configuration

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.1 Reactor Protective System (RPS) Instrumentation ~~- Operating (Analog)~~

BASES

BACKGROUND

The Reactor Protective System (RPS) initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and breaching the reactor coolant pressure boundary (RCPB) during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents.

The protection and monitoring systems 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.

Technical Specifications are required by 10 CFR 50.36 to include LSSS for variables that have significant safety functions. LSSS are defined by the regulation as "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a safety action is initiated, as established by the safety analysis, to ensure that a SL is not exceeded. Any automatic protection action that occurs on reaching the Analytical Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protection channels must be chosen to be more conservative than the Analytical Limit to account for channel uncertainties related to the setting at which the automatic protective action would actually occur.

~~------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The term "Limiting Trip Setpoint" [LTSP] is generic terminology for the calculated trip setting (setpoint) value calculated by means of the plant specific setpoint methodology documented in a document controlled under 10 CFR 50.59. The term [LTSP] indicates that no additional margin has been added between the Analytical Limit and the calculated trip setting.~~

~~"Nominal Trip Setpoint [NTSP]" is the suggested terminology for the actual setpoint implemented in the plant surveillance procedures where margin has been added to the calculated [LTSP]. The as-found and as-left tolerances will apply to the [NTSP] implemented in the Surveillance procedures to confirm channel performance.~~

BASES

BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances in Note b of Table 3.3.1-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ 4

~~Where the [LTSP] is not included in Table 3.3.1-1, the plant specific location for the [LTSP] or [NTSP] must be cited in Note b of Table 3.3.1-1. The brackets indicate plant specific terms may apply, as reviewed and approved by the NRC.~~

The ~~[Limiting~~ Nominal Trip Setpoint (~~LTSP~~ NTSP)~~]~~ specified in ~~Table 3.3.1-1~~ Reference 1 is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[LTSP]~~ NTSP accounts for uncertainties in setting the channel (e.g., calibration), uncertainties in how the channel might actually perform (e.g., repeatability), changes in the point of action of the channel over time (e.g., drift during surveillance intervals), and any other factors which may influence its actual performance (e.g., harsh accident environments). In this manner, the ~~[LTSP]~~ NTSP ensures that SLs are not exceeded. Therefore, the ~~[LTSP]~~ NTSP meets the definition of an LSSS (Ref. ~~1~~ 2). 1 3 1

Technical Specifications contain values related to the OPERABILITY of equipment required for safe operation of the facility. OPERABLE is defined in Technical Specifications as "...being capable of performing its safety function(s)." Relying solely on the ~~[LTSP]~~ NTSP to define OPERABILITY in Technical Specifications would be an overly restrictive requirement if it were applied as an OPERABILITY limit for the "as-found" value of a protection channel setting during a Surveillance. This would result in Technical Specification compliance problems, as well as reports and corrective actions required by the rule which are not necessary to ensure safety. For example, an automatic protection channel with a setting that has been found to be different from the ~~[LTSP]~~ NTSP due to some drift of the setting may still be OPERABLE because drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the ~~[LTSP]~~ NTSP and thus the automatic protective action would still have ensured that the SL would not be exceeded with the "as-found" setting of the protection channel. Therefore, the channel would still be OPERABLE because it would have performed its safety function and the only corrective action required would be to reset the channel within the established as-left ~~tolerance~~ acceptance criteria band around the ~~[LTSP]~~ NTSP to account for further drift during the next surveillance interval. Note that, 3 5

BASES

BACKGROUND (continued)

acceptance criteria band

although the channel is OPERABLE under these circumstances, the trip setpoint must be left adjusted to a value within the as-left ~~tolerance~~ in accordance with uncertainty assumptions stated in the referenced setpoint methodology (as-left criteria), and confirmed to be operating within the statistical allowances of the uncertainty terms assigned (as-found criteria). 5

However, there is also some point beyond which the channel may not be able to perform its function due to, for example, greater than expected drift. This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value.

acceptance criteria band (e.g., conservative side of the as-found acceptance criteria band)

acceptance criteria band

If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found ~~tolerance band~~, the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[Nominal Trip Setpoint (~~NTSP~~)]~~ (within the allowed ~~tolerance~~), and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance. After the surveillance is completed, the channel as-found condition will be entered into the Corrective Action Program for further evaluation. 5 3

During AOOs, which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio (DNBR) shall be maintained above the SL value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System (RCS) pressure SL of ~~[~~2750~~]~~ psia shall not be exceeded. 3

Maintaining the parameters within the above values ensures that the offsite dose will be within the ~~10 CFR 50 (Ref. 2) and~~ 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) criteria during AOOs. 1

BASES

BACKGROUND (continued)

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) limits. Different accident categories allow a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event. 1

The RPS is segmented into four interconnected modules. These modules are:

- Measurement channels,
- Bistable trip units,
- RPS Logic, and
- Reactor trip circuit breakers (RTCBs).

This LCO addresses measurement channels and bistable trip units. It also addresses the automatic bypass removal feature for those trips with operating bypasses. The RPS Logic and RTCBs are addressed in LCO 3.3.~~3~~2, "Reactor Protective System (RPS) Logic and Trip Initiation." 1

The role of each of these modules in the RPS, including those associated with the logic and RTCBs, is discussed below.

Measurement Channels

Measurement channels, consisting of field transmitters or process sensors and associated instrumentation, provide a measurable electronic signal based upon the physical characteristics of the parameter being measured.

The excore nuclear instrumentation and the analog core protection calculators (CPCs) are considered components in the measurement channels. The wide range nuclear instruments (NIs) provide a Power Rate of Change - High Trip. Three RPS trips use a power level designated as Q power as an input. Q power is the higher of NI power and primary calorimetric power (ΔT power) based on RCS hot leg and cold leg temperatures. Trips using Q power as an input include the Variable ~~High~~ Power Level Trip (VHPT) - High, Thermal Margin/Low Pressure (TM/LP), and the ~~Axial~~ Local Power ~~Distribution (APD)~~ Density - High trips. 1

BASES

BACKGROUND (continued)

Local Power Density

The analog CPCs provide the complex signal processing necessary to calculate the TM/LP trip setpoint, ~~APD~~ trip setpoint, VHPT trip setpoint, and Q power calculation. 1

linear

Local Power Density

The excore NIs (wide range and ~~power~~ range) and the analog CPCs (TM/LP and ~~APD~~ calculators) are mounted in the RPS cabinet, with one channel of each in each of the four RPS bays. 1

Four identical measurement channels, designated channels A through D, with electrical and physical separation are provided for each parameter used in the direct generation of trip signals. Measurement channels provide input to one or more RPS bistables within the same RPS channel. In addition, some measurement channels may also be used as inputs to Engineered Safety Features Actuation System (ESFAS) bistables, and most provide indication in the control room. Measurement channels used as an input to the RPS are never used for control functions.

When a channel monitoring a parameter exceeds a predetermined setpoint, indicating an unsafe condition, the bistable monitoring the parameter in that channel will trip. Tripping two or more channels of bistables monitoring the same parameter de-energizes the Matrix Logic, which in turn de-energizes the Initiation Logic. This causes all eight RTCBs to open, interrupting power to the control element assemblies (CEAs), allowing them to fall into the core. 7

Three of the four measurement and bistable channels are necessary to meet the redundancy and testability of GDC 21 in 10 CFR 50, Appendix A (Ref. ~~2~~ 3). The fourth channel provides additional flexibility by allowing one channel to be removed from service (trip channel bypass) for maintenance or testing while still maintaining a minimum two-out-of-three logic. Thus, even with a channel inoperable, no single additional failure in the RPS can either cause an inadvertent trip or prevent a required trip from occurring. 1

Since no single failure will either cause or prevent a protective system actuation, and no protective channel feeds a control channel, this arrangement meets the requirements of IEEE Standard 279-1971 (Ref. ~~4~~ 5). 1

Many of the RPS trips are generated by comparing a single measurement to a fixed bistable ~~[LTSP]~~ NTSP. Certain Functions, however, make use of more than one measurement to provide a trip. The following trips use multiple measurement channel inputs. 3

BASES

BACKGROUND (continued)

- Steam Generator Level - Low

  This trip uses the lower of the two steam generator levels as an input to a common bistable.

- Steam Generator Pressure - Low

  This trip uses the lower of the two steam generator pressures as an input to a common bistable.

- Variable ~~High~~ Level Power Trip (VHPT) - High 1

  The VHPT uses Q power as its only input. Q power is the higher of NI power and ΔT power. It has a trip setpoint that tracks power levels downward so that it is always within a fixed increment above current power, subject to a minimum value.

  On power increases, the trip setpoint remains fixed unless manually reset, at which point it increases to the new setpoint, a fixed increment above Q power at the time of reset, subject to a maximum value. Thus, during power escalation, the trip setpoint must be repeatedly reset to avoid a reactor trip.

- Thermal Margin/Low Pressure (TM/LP) and Steam Generator Pressure Difference

  Q power is only one of several inputs to the TM/LP trip. Other inputs include internal ASI and cold leg temperature based on the higher of two cold leg resistance temperature detectors. The TM/LP trip setpoint is a complex function of these inputs and represents a minimum acceptable RCS pressure to be compared to actual RCS pressure in the TM/LP trip unit.

  Steam generator pressure is also an indirect input to the TM/LP trip via the Steam Generator Pressure Difference. This Function provides a reactor trip when the secondary pressure in either steam generator exceeds that of the other generator by greater than a fixed amount. The trip is implemented by biasing the TM/LP trip setpoint upward so as to ensure TM/LP trip if an asymmetric steam generator transient is detected.

- ~~Axial Power Distribution (APD)~~ Local Power Density – High

  Q Power and ASI are inputs to the ~~APD~~ Local Power Density trip. The ~~APD~~ Local Power Density trip setpoint is a function of Q power, being more restrictive at higher power levels. It provides a reactor trip if actual ASI exceeds the ~~APD~~ Local Power Density trip setpoint. 1

BASES

BACKGROUND (continued)

Bistable Trip Units

Bistable trip units, mounted in the RPS cabinet, receive an analog input from the measurement channels, compare the analog input to trip setpoints, and provide contact output to the Matrix Logic. They also provide local trip indication and remote annunciation.

There are four channels of bistable trip units, designated A through D, for each RPS Function, one for each measurement channel. Bistable output relays de-energize when a trip occurs.

The contacts from these bistable relays are arranged into six coincidence matrices, comprising the Matrix Logic. If bistables monitoring the same parameter in at least two channels trip, the Matrix Logic will generate a reactor trip (two-out-of-four logic).

Some of the RPS measurement channels provide contact outputs to the RPS, so the comparison of an analog input to a trip setpoint is not necessary. In these cases, the bistable trip unit is replaced with an auxiliary trip unit. The auxiliary trip units provide contact multiplication so the single input contact opening can provide multiple contact outputs to the coincidence logic as well as trip indication and annunciation.

Local Power Density
turbine generator control system hydraulic

Trips employing auxiliary trip units include the Loss of Load trip and the ~~APD~~ - High trip. The Loss of Load trip is a contact input from the ~~Electro Hydraulic Control System~~ control oil pressure ~~on~~ each of ~~the~~ four high pressure ~~stop valves~~. 1

from
switches
Local Power Density

The ~~APD~~ trip, described above, is a complex function in which the actual trip comparison is performed within the CPC. Therefore the ~~APD~~ - High trip unit employs a contact input from the CPC. 1

Local Power Density

All RPS trips, with the exception of the Loss of Load trip, generate a pretrip alarm as the trip setpoint is approached.

NTSP
6

The trip setpoints used in the bistable trip units are based on the analytical limits stated in Reference ~~5~~. The calculation of the ~~[LTSP]~~ specified in Table 3.3.1-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration ~~tolerances~~, instrumentation uncertainties, instrument drift, and severe environment errors - for those RPS channels that must function in harsh environments, as defined by 10 CFR 50.49 (Ref. ~~6~~) - Allowable Values specified in Table 3.3.1-1, in the accompanying LCO, 3 1 5

acceptance criteria bands
7

BASES

BACKGROUND (continued)

are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in ~~the "Plant Protection System Selection of Trip Setpoint Values"~~ IC-3.17, "Instrument Setpoint Methodology for Nuclear Power Plants" (Ref. ~~7~~ 8). The trip setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value, to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the interval between surveillances. 1

The ~~[LTSP]~~ NTSP is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[LTSP]~~ NTSP value is the LSSS and ensures the safety analysis limits are met for the surveillance interval selected when a channel is adjusted based on stated channel uncertainties. 3

~~[LTSP~~ NTSPs~~]~~, in conjunction with the use of as-found and as-left ~~tolerances~~ acceptance criteria bands, consistent with the requirements of the Allowable Value will ensure that SLs of Chapter 2.0 are not violated during AOOs and the consequences of DBAs will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed. 3 5

Note that in the accompanying LCO 3.3.1, the Allowable Values of Table 3.3.1-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION or CHANNEL FUNCTIONAL TEST.

<u>RPS Logic</u>

The RPS Logic, addressed in LCO 3.3.~~3~~2, consists of both Matrix and Initiation Logic and employs a scheme that provides a reactor trip when bistables in any two out of the four channels sense the same input parameter trip. This is called a two-out-of-four trip logic. ~~This logic and the RTCB configuration are shown in Figure B 3.3.1-1.~~ 1 6

Bistable relay contact outputs from the four channels are configured into six logic matrices. Each logic matrix checks for a coincident trip in the same parameter in two bistable channels. The matrices are designated the AB, AC, AD, BC, BD, and CD matrices to reflect the bistable channels being monitored. Each logic matrix contains four normally energized matrix relays. When a coincidence is detected, consisting of a trip in the same Function in the two channels being monitored by the logic matrix, all four matrix relays de-energize.

BASES

BACKGROUND (continued)

The matrix relay contacts are arranged into trip paths, with one of the four matrix relays in each matrix opening contacts in one of the four trip paths. Each trip path provides power to one of the four normally energized RTCB control relays (K1, K2, K3, and K4). The trip paths thus each have six contacts in series, one from each matrix, and perform a logical OR function, opening the RTCBs if any one or more of the six logic matrices indicate a coincidence condition.

Each trip path is responsible for opening one set of two of the eight RTCBs. The RTCB control relays (K-relays), when de-energized, interrupt power to the breaker undervoltage trip attachments and simultaneously apply power to the shunt trip attachments on each of the two breakers. Actuation of either the undervoltage or shunt trip attachment is sufficient to open the RTCB and interrupt power from the motor generator (MG) sets to the control element drive mechanisms (CEDMs).

When a coincidence occurs in two RPS channels, all four matrix relays in the affected matrix de-energize. This in turn de-energizes all four RTCB control relays, which simultaneously de-energize the undervoltage and energize the shunt trip attachments in all eight RTCBs, tripping them open.

Matrix Logic refers to the matrix power supplies, trip channel bypass contacts, and interconnecting matrix wiring between bistable and auxiliary trip units, up to but not including the matrix relays. Contacts in the bistable and auxiliary trip units are excluded from the Matrix Logic definition, since they are addressed as part of the measurement channel.

The Initiation Logic consists of the trip path power source, matrix relays and their associated contacts, all interconnecting wiring, and solid state (auxiliary) relays through the K-relay contacts in the RTCB control circuitry.

It is possible to change the two-out-of-four RPS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by trip channel bypassing select portions of the Matrix Logic. Trip channel bypassing a bistable effectively shorts the bistable relay contacts in the three matrices associated with that channel. Thus, the bistables will function normally, producing normal trip indication and annunciation, but a reactor trip will not occur unless two additional channels indicate a trip condition. Trip channel bypassing can be simultaneously performed on

BASES

BACKGROUND (continued)

A mechanical interlock (key capture) in conjunction with administrative control

any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. ~~An interlock~~ prevents simultaneous trip channel bypassing of the same parameter in more than one channel. Trip channel bypassing is normally employed during maintenance or testing. 1

For those plants that have demonstrated sufficient channel to channel independence, two-out-of-three logic is the minimum that is required to provide adequate plant protection, since a failure of one channel still ensures a reactor trip would be generated by the two remaining OPERABLE channels. Two-out-of-three logic also prevents inadvertent trips caused by any single channel failure in a trip condition.

Zero Power Mode trips (Reactor Coolant Flow – Low and Thermal Margin/Low Pressure), Local Power Density - High, Loss of Load -High,

Local Power Density

In addition to the trip channel bypasses, there are also operating bypasses on select RPS trips. Some of these bypasses are enabled manually, others automatically, in all four RPS channels when plant conditions do not warrant the specific trip protection. All operating bypasses are automatically removed when enabling bypass conditions are no longer satisfied. Trips with operating bypasses include Power Rate of Change - High, ~~Reactor Coolant Flow - Low,~~ Steam Generator Pressure - Low, ~~APD - High, TM/LP,~~ and Steam Generator Pressure Difference. ~~[~~The Loss of Load trip, Power Rate of Change - High, and ~~APD~~ - High operating bypasses are automatically enabled and disabled.~~]~~ 1 3

The Variable Power Level – High bypass is manual enable but automatically disabled.

Reactor Trip Circuit Breakers (RTCBs)

2

The reactor trip switchgear, addressed in LCO 3.3.~~3 and shown in Figure B 3.3.1-1~~, consists of eight RTCBs, which are operated in four sets of two breakers (four channels). Power input to the reactor trip switchgear comes from two full capacity MG sets operated in parallel such that the loss of either MG set does not de-energize the CEDMs. There are two separate CEDM power supply buses, each bus powering half of the CEDMs. Power is supplied from the MG sets to each bus via two redundant paths (trip legs). Trip legs 1A and 1B supply power to CEDM bus 1. Trip legs 2A and 2B supply power to CEDM bus 2. This ensures that a fault or the opening of a breaker in one trip leg (i.e., for testing purposes) will not interrupt power to the CEDM buses. 6

Each of the four trip legs consists of two RTCBs in series. The two RTCBs within a trip leg are actuated by separate initiation circuits.

BASES

BACKGROUND (continued)

The eight RTCBs are operated as four sets of two breakers (four channels). For example, if a breaker receives an open signal in trip leg A (for CEDM bus 1), an identical breaker in trip leg B (for CEDM bus 2) will also receive an open signal. This arrangement ensures that power is interrupted to both CEDM buses, thus preventing trip of only half of the CEAs (a half trip). Any one inoperable breaker in a channel will make the entire channel inoperable.

Each set of RTCBs is operated by either a Manual Trip push button or an RPS actuated K-relay. There are four Manual Trip push buttons~~,~~ arranged in two sets of two~~, as shown in Figure B 3.3.1-1~~. Depressing both push buttons in either set will result in a reactor trip. 6

When a Manual Trip is initiated using the control room push buttons, the RPS trip paths and K-relays are bypassed, and the RTCB undervoltage and shunt trip attachments are actuated independent of the RPS.

Manual Trip circuitry includes the push button and interconnecting wiring to both RTCBs necessary to actuate both the undervoltage and shunt trip attachments but excludes the K-relay contacts and their interconnecting wiring to the RTCBs, which are considered part of the Initiation Logic.

Functional testing of the entire RPS, from bistable input through the opening of individual sets of RTCBs, can be performed either at power or shutdown and is ~~normally~~ performed ~~on a quarterly basis~~ per the Surveillance Frequency Control Program. 9 1 3
U FSAR, Section ~~[~~7.2~~]~~ (Ref. ~~8~~), explains RPS testing in more detail.

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents and transients can be detected by one or more RPS Functions. The accident analysis contained in Reference ~~5~~ 6 takes credit for most RPS trip Functions. Functions not specifically credited in the accident analysis are part of the NRC approved licensing basis for the plant. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. Other Functions, such as the Loss of Load trip, are purely equipment protective, and their use minimizes the potential for equipment damage. 1

Permissive and interlock setpoints allow the blocking of trips during plant startups, and restoration of trips when the permissive conditions are not satisfied, but they are not explicitly modeled in the Safety Analyses. These permissives and interlocks ensure that the starting conditions are consistent with the safety analysis, before preventive or mitigating actions occur. Because these permissives or interlocks are only one of multiple conservative starting assumptions for the accident analysis, they are generally considered as nominal values without regard to measurement accuracy.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The specific safety analyses applicable to each protective Function are identified below:

Level

1. Variable ~~High~~ Power Trip (VHPT) - High

   The VHPT provides reactor core protection against positive reactivity excursions that are too rapid for a Pressurizer Pressure - High or TM/LP trip to protect against. The following events require VHPT protection:

   - Uncontrolled CEA withdrawal event,
   - ~~Excess load,~~ 1
   - Excess feedwater heat removal event,
   - CEA ejection event, and
   -
   - Main steam line break (MSLB) (~~outside containment~~). Backup Protection

   two

   third and fourth

   The first t~~hree~~ events are AOOs, and fuel integrity is maintained. The ~~fourth and fifth~~ are accidents, and limited fuel damage may occur.

2. Power Rate of Change - High

   The Power Rate of Change - High trip is used to trip the reactor when excore ~~[~~logarithmic~~]~~ power indicates an excessive rate of change. 3
   The Power Rate of Change - High Function ~~minimizes transients for events such as a continuous CEA withdrawal or a boron dilution event from low power levels~~. The trip may be bypassed when THERMAL POWER is < 1E-4% RTP, when poor counting statistics may lead to erroneous indication. ~~It is also~~ bypassed at > 15% RTP, where moderator temperature coefficient and fuel temperature coefficient make high rate of change of power unlikely. With the RTCBs open, the Power Rate of Change - High trip is not required to be OPERABLE; however, the indication ~~and alarm~~ Function~~s~~ of at least two channels ~~are~~ required by LCO 3.3.1~~3~~, "~~[~~Logarithmic~~]~~ ~~Power~~ Monitoring ~~Channels~~," to be OPERABLE. LCO 3.3.1~~3~~ ensures the ~~[~~logarithmic~~]~~ channels are available to detect ~~and alert the operator to~~ a boron dilution event.

   is not credited in the accident analysis as providing primary protection for any limiting case AOO or accident. 1

   In addition, the trip is not required to be OPERABLE and is 1

   Neutron Flux

   is 3 1

   1 3 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

3. Reactor Coolant Flow - Low

The Reactor Coolant Flow - Low trip provides protection during the following events:

- Loss of RCS flow,
- Loss of ~~nonemergency~~ AC power, and
- Reactor coolant pump (RCP) seized/sheared shaft~~,~~
- ~~RCP sheared shaft, and~~
- ~~Certain MSLB events~~.

The loss of RCS flow and ~~of nonemergency~~ AC power events are AOOs where fuel integrity is maintained. The RCP seized shaft~~,~~ and sheared shaft~~, and MSLBs~~ are accidents where fuel damage may result.

4. Pressurizer Pressure - High

The Pressurizer Pressure - High trip, in conjunction with pressurizer safety valves and main steam safety valves (MSSVs), provides protection against overpressure conditions in the RCS during the following events:

- Loss of condenser vacuum ~~with a concurrent loss of offsite power,~~
- ~~Loss of condenser vacuum with a concurrent loss of one 6.9 kV bus~~,
- Turbine trip ~~Isolation of turbine at 102% power~~,
- Feedwater line break (small) ~~System pipe breaks between the steam generator and check valve~~,
- CEA withdrawal, and
- Loss of feedwater flow.

1

BASES

APPLICABLE SAFETY ANALYSES (continued)

5. Containment Pressure - High

The Containment Pressure - High trip prevents exceeding the containment design pressure during certain loss of coolant accidents (LOCAs) or feedwater line break accidents. It ensures a reactor trip prior to, or concurrent with, a LOCA, thus assisting the ESFAS in the event of a LOCA or MSLB. Since these are accidents, SLs may be violated. However, the consequences of the accident will be acceptable.

6. Steam Generator Pressure - Low

The Steam Generator Pressure - Low trip provides protection against an excessive rate of heat extraction from the steam generators, which would result in a rapid uncontrolled cooldown of the RCS. This trip is needed to shut down the reactor and assist the ESFAS in the event of an MSLB. Since these are accidents, SLs may be violated. However, the consequences of the accident will be acceptable.

7.a, 7.b. Steam Generator A and B Level - Low

The Steam Generator A Level - Low and Steam Generator B Level - Low trips are required for the following events:

- Steam System piping failures,
- Feedwater System pipe breaks, and
- Inadvertent opening of a main steam safety or steam generator atmospheric dump valve (ADV)~~,~~ 1
- ~~Loss of normal feedwater, and~~
- ~~Asymmetric loss of feedwater~~.

The Steam Generator Level - Low trip ensures that low DNBR, high local power density, and the RCS pressure SLs are maintained during normal operation and AOOs, and, in conjunction with the ESFAS, the consequences of the Feedwater System pipe break accident will be acceptable.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Local Power Density

8. ~~Axial Power Distribution (APD)~~ - High 1

The ~~APD~~ - High trip ensures that excessive axial peaking, such as that due to axial xenon oscillations, will not cause fuel damage. It ensures that neither a DNBR less than the SL nor a peak linear heat rate that corresponds to the temperature for fuel centerline melting will occur. This trip is the primary protection against fuel centerline melting.

9. Thermal Margin

a. Thermal Margin/Low Pressure (TM/LP)

The TM/LP trip prevents exceeding the DNBR SL during AOOs and aids the ESFAS during certain accidents. The following events require TM/LP protection:

- Excess load (inadvertent opening of a steam generator ADV),
- RCS depressurization (inadvertent safety ~~or power operated relief~~ valve~~s (PORVs)~~ opening), 1
- Steam generator tube rupture, and
- LOCA accident.

The first two events are AOOs, and fuel integrity is maintained. The third and fourth are accidents, and limited fuel damage may occur although only the LOCA is expected to result in fuel damage. The trip is initiated whenever the RCS pressure signal drops below a minimum value (P_{min}) or a computed value (P_{var}) as described below, whichever is higher. The computed value is a Function Q power, ASI, as determined from the axially split

and

excore detectors~~,~~ reactor inlet (cold leg) temperature~~, and the number of RCPs operating~~. 1

azimutal tilt

The minimum value of reactor coolant flow rate, the maximum ~~T_Q~~, and the maximum CEA deviation permitted for continuous operation are assumed in the generation of this trip Function. In addition, CEA group sequencing in accordance with LCO 3.1.6, "Regulating Control Element Assembly (CEA) Insertion Limits," is assumed. Finally, the maximum insertion of CEA banks that can occur during any AOO prior to a VHPT is assumed. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

b. Steam Generator Pressure Difference

The Steam Generator Pressure Difference provides protection for those AOOs associated with secondary system malfunctions that result in asymmetric primary coolant temperatures. The most limiting event is closure of a single main steam isolation valve. Steam Generator Pressure Difference is provided by comparing the secondary pressure in both steam generators in the TM/LP calculator. If the pressure in either exceeds that in the other by the trip setpoint, a TM/LP trip will result.

10. Loss of Load

The Loss of Load (turbine ~~stop valve (TSV)~~ control oil pressure) trip is anticipatory for the loss of heat removal capabilities of the secondary system following a turbine trip. The Loss of Load trip prevents lifting the pressurizer safety valves, PORVs, and MSSVs in the event of a turbine generator trip. Thus, the trip minimizes the pressure and temperature transients on the reactor by initiating a trip well before reaching the Pressurizer Pressure - High trip and pressurizer safety valve setpoints. The four RPS Loss of Load reactor trip channels receive their input from ~~sensors mounted on the high pressure TSV actuators. Since there are four high pressure TSVs, one actuator per valve and one sensor per actuator, each sensor sends its signal to a different RPS channel. When the turbine trips, control oil is dumped from the high pressure TSVs. When the control oil pressure drops to the appropriate setpoint, a reactor trip signal is generated.~~ four redundant pressure switches mounted on the emergency trip fluid line common header, to serve as the loss of load, turbine trip input to the Reactor Protective System logic matrices. Actuation of any two of the pressure switches on low hydraulic oil pressure causes a reactor trip. 1

Interlocks/Bypasses

The bypasses and their Allowable Values are addressed in footnotes to Table 3.3.1-1. They are not otherwise addressed as specific Table entries.

The automatic bypass removal features must function as a backup to manual actions for all safety related trips to ensure the trip Functions are not operationally bypassed when the safety analysis assumes the Functions are not bypassed. The RPS operating bypasses are:

Zero power mode bypass (ZPMB) removal on the TM/LP, Steam Generator Pressure Difference, and reactor coolant low flow trips when THERMAL POWER is < ~~1E-4~~ 0.5% RTP. This bypass is manually enabled below the specified setpoint to permit low power testing. The wide range NI Level 1 bistable in the wide range drawer permits manual bypassing below the setpoint and removes the bypass above the setpoint. 1

BASES

APPLICABLE SAFETY ANALYSES (continued)

Power rate of change bypass removal. The Power Rate of Change - High trip is automatically bypassed at < 1E-4% RTP, as sensed by the wide range NI Level 2 bistable, and at > ~~12~~ 15% RTP by the power range NI Level 1 bistable, mounted in their respective NI drawers. Automatic bypass removal is also effected by these bistables when conditions are no longer satisfied. 1

Loss of Load and ~~APD~~ Local Power Density - High bypass removal. The Loss of Load and ~~APD~~ Local Power Density - High trips are automatically bypassed when at < 15% RTP as sensed by the power range NI Level 1 bistable. The bypass is automatically removed by this bistable above the setpoint. This same bistable is used to bypass the Power Rate of Change - High trip. 1

Steam Generator Pressure - Low bypass removal. The Steam Generator Pressure - Low trip is manually enabled below the pretrip setpoint. The permissive is removed, and the bypass automatically removed, when the Steam Generator Pressure - Low pretrip clears.

The RPS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires all instrumentation performing an RPS Function to be OPERABLE. Failure of any required portion of the instrument channel renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. The specific criteria for determining channel OPERABILITY differ slightly between Functions. These criteria are discussed on a Function by Function basis below.

Actions allow maintenance (trip channel) bypass of individual channels, but ~~the bypass activates interlocks that prevent~~ operation with a second channel in the same Function bypassed is prevented. ~~Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At plants where adequate channel to channel independence has been demonstrated, specific exceptions may be approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~ 1

Allowable Values for RPS Instrumentation Functions are specified in Table 3.3.1-1. ~~[LTSPs]~~ NTSPs and the methodologies for calculation of the as-left and as-found ~~tolerances~~ acceptance criteria are described in ~~[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. The ~~[LTSPs]~~ NTSPs are selected to ensure that the actual setpoints remain conservative with respect to the as-found ~~tolerance~~ band between successive CHANNEL CALIBRATIONS. After each calibration the trip setpoint shall be left within the as-left band around the ~~[LTSP]~~ NTSP. 5 3 5

BASES

LCO (continued)

The following Bases for each trip Function identify the above RPS trip Function criteria items that are applicable to establish the trip Function OPERABILITY.

Level

1. Variable ~~High~~ Power Trip (VHPT) - High 1

This LCO requires all four channels of the VHPT to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to provide an operating envelope that prevents unnecessary Linear Power Level - High reactor VHPT - High trips during normal plant operations. The Allowable Value is low enough for the system to maintain a margin to unacceptable fuel cladding damage should a CEA ejection accident occur.

The VHPT setpoint is operator adjustable and can be set at a fixed increment above the indicated THERMAL POWER level. Operator action is required to increase the trip setpoint as THERMAL POWER is increased. The trip setpoint is automatically decreased as THERMAL POWER decreases. The ~~[LTSP]~~ NTSP has a maximum and a minimum setpoint. 3

Adding to this maximum value the possible variation in ~~[LTSP]~~ NTSP due to calibration and instrument errors, the maximum actual steady state THERMAL POWER level at which a trip would be actuated is ~~112~~ 107% RTP~~, which is the value used in the safety analyses~~. 3

~~To account for these errors, the safety analysis minimum value is 40% RTP. The 10% step is a maximum value assumed in the safety analysis. There is no uncertainty applied to the step.~~ 1

2. Power Rate of Change - High

This LCO requires four channels of Power Rate of Change - High to be OPERABLE in MODE 1 with THERMAL POWER ≤ 15% RTP and MODE 2 ~~MODES 1 and 2, as well as in MODES 3, 4, and 5 when the RTCBs are closed and the CEA Drive System is capable of CEA withdrawal~~. 1

The high power rate of change trip serves as a backup to the administratively enforced startup rate limit. The Function is not credited in the accident analyses; therefore, the Allowable Value for the trip or bypass Functions is not derived from analytical limits.

BASES

LCO (continued)

3. Reactor Coolant Flow - Low

This LCO requires four channels of Reactor Coolant Flow - Low to be OPERABLE in MODES 1 and 2.

The trip may be manually bypassed when THERMAL POWER falls below 0.5 ~~1E-4~~% RTP. This bypass is part of the ZPMB circuitry, which also bypasses the TM/LP trip and provides a ΔT power block signal to the Q power select logic. This ZPMB allows low power physics testing at reduced RCS temperatures and pressures. It also allows heatup and cooldown with shutdown CEAs withdrawn.

This trip is set high enough to maintain fuel integrity during a loss of flow condition. The setting is low enough to allow for normal operating fluctuations from offsite power. ~~To account for analysis uncertainty, the value in the safety analysis is 93% RTP.~~

4. Pressurizer Pressure - High

This LCO requires four channels of Pressurizer Pressure - High to be OPERABLE in MODES 1 and 2. 1

The Allowable Value is set high enough to allow for pressure increases in the RCS during normal operation (i.e., plant transients) not indicative of an abnormal condition. The setting is below the lift setpoint of the pressurizer safety valves and low enough to initiate a reactor trip when an abnormal condition is indicated. ~~The difference between the Allowable Value and the analysis setpoint of 2470 psia includes allowance for harsh environment.~~

The Pressurizer Pressure - High trip concurrent with PORV operation avoids unnecessary operation of the pressurizer safety valves.

5. Containment Pressure - High

This LCO requires four channels of Containment Pressure - High to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) that are not indicative of an abnormal condition. The setting is low enough to initiate a reactor trip to prevent containment pressure from exceeding design pressure following a DBA.

BASES

LCO (continued)

6. Steam Generator Pressure - Low

This LCO requires four channels of Steam Generator Pressure - Low per steam generator to be OPERABLE in MODES 1 and 2.

The Allowable Value is sufficiently below the full load operating value for steam pressure so as not to interfere with normal plant operation, but still high enough to provide the required protection in the event of excessive steam demand. Since excessive steam demand causes the RCS to cool down, resulting in positive reactivity addition to the core, a reactor trip is required to offset that effect.

~~The difference between the Allowable Value and the safety analysis value of 600 psia includes harsh environment uncertainties.~~ 1

The Function may be manually bypassed as steam generator pressure is reduced during controlled plant shutdowns. This bypass is permitted at a preset steam generator pressure. The bypass, in conjunction with the ZPMB, allows testing at low temperatures and pressures, and heatup and cooldown with the shutdown CEAs withdrawn. From a bypass condition the trip will be reinstated automatically as steam generator pressure increases above the preset pressure.

7.a, 7.b. Steam Generator Level – Low

This LCO requires four channels of Steam Generator Level - Low per steam generator to be OPERABLE in MODES 1 and 2.

The Allowable Value is sufficiently below the normal operating level for the steam generators so as not to cause a reactor trip during normal plant operations. The trip setpoint is high enough to ensure a reactor trip signal is generated before water level drops below the top of the feed ring. ~~The difference between the Allowable Value and the measurement value includes 10 inches of measurement uncertainty. The specified setpoint ensures there will be sufficient water inventory to provide a 10 minute margin before auxiliary feedwater is required for the removal of decay heat.~~ 1

BASES

LCO (continued)

8. ~~Axial Power Distribution (APD)~~ Local Power Density - High

This LCO requires four channels of ~~APD~~ Local Power Density - High to be OPERABLE in MODE 1 ≥ 15% RTP.

The Allowable Value curve was derived from an analysis of many axial power shapes with allowances for instrumentation inaccuracies and the uncertainty associated with the excore to incore ASI relationship. 1

The ~~APD~~ Local Power Density trip is automatically bypassed at < 15% RTP, where it is not required for reactor protection.

9. Thermal Margin

a. Thermal Margin/Low Pressure (TM/LP)

This LCO requires four channels of TM/LP to be OPERABLE in MODES 1 and 2.

The Allowable Value includes allowances for equipment response time, measurement uncertainties, processing error, and a further allowance to compensate for the time delay associated with providing effective termination of the occurrence that exhibits the most rapid decrease in margin to the SL.

This trip may be manually bypassed when THERMAL POWER falls below ~~1E-4~~ 0.5% RTP. This bypass is part of the ZPMB circuitry, which also bypasses the Reactor Coolant Flow - Low trip and provides a ΔT power block signal to the Q power select logic. This ZPMB allows low power physics testing at reduced RCS temperatures and pressures. It also allows heatup and cooldown with shutdown CEAs withdrawn. 1

b. Steam Generator Pressure Difference

This LCO requires four channels of Steam Generator Pressure Difference to be OPERABLE in MODES 1 and 2.

The Allowable Value is high enough to avoid trips caused by normal operation and minor transients, but ensures DNBR protection in the event of Design Basis Events. ~~The difference between the Allowable Value and the 175 psia analysis setpoint allows for 40 psia of measurement uncertainty.~~ 1

BASES

LCO (continued)

The trip may be bypassed when THERMAL POWER falls below 0.5 ~~1E-4~~% RTP. The Steam Generator Pressure Difference is subject to the ZPMB, since it is an input to the TM/LP trip and is not required for protection at low power levels. 1

10. Loss of Load

The LCO requires four Loss of Load trip channels to be OPERABLE in MODE 1 ≥ 15% RTP.

The Loss of Load trip may be bypassed when THERMAL POWER falls below 15%, since it is no longer needed to prevent lifting of the pressurizer safety valves, steam generator safety valves, or PORVs in the event of a Loss of Load. The Nuclear Steam Supply System and the Steam Dump System are capable of accommodating the Loss of Load without requiring the use of the above equipment.

Interlocks/Bypasses

The LCO on bypass permissive removal channels requires that the automatic bypass removal feature of all four operating bypass channels be OPERABLE for each RPS Function with an operating bypass in the MODES addressed in the specific LCO for each Function. All four bypass removal channels must be OPERABLE to ensure that none of the four RPS channels are inadvertently bypassed.

The LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The interlock Allowable Values are based on analysis requirements for the bypassed functions. These are discussed above as part of the LCO discussion for the affected Functions.

APPLICABILITY

This LCO is applicable in accordance with Table 3.3.1-1. Most RPS trips are required to be OPERABLE in MODES 1 and 2 because the reactor is critical in these MODES. The trips are designed to take the reactor subcritical, maintaining the SLs during AOOs and assisting the ESFAS in providing acceptable consequences during accidents. Exceptions are addressed in footnotes to the table. Exceptions to this APPLICABILITY are:

- The Local Power Density ~~APD~~ - High Trip and Loss of Load are only applicable in MODE 1 ≥ 15% RTP because they may be automatically bypassed at < 15% RTP, where they are no longer needed. 1

BASES

APPLICABILITY (continued)

- ~~The Power Rate of Change - High trip, RPS Logic, RTCBs, and Manual Trip are also required in MODES 3, 4, and 5, with the RTCBs closed, to provide protection for boron dilution and CEA withdrawal events. The Power Rate of Change - High trip in these lower MODES is addressed in LCO 3.3.2, "Reactor Protective System (RPS) Instrumentation - Shutdown." The RPS Logic in MODES 1, 2, 3, 4, and 5 is addressed in LCO 3.3.3.~~ 1

The RPS ~~Most~~ trips are not required to be OPERABLE in MODES 3, 4, and 5. In MODES 3, 4, and 5, the emphasis is placed on return to power events. The reactor is protected in these MODES by ensuring adequate SDM.

ACTIONS

The most common causes of channel inoperability are outright failure or drift of the bistable or process module sufficient to exceed the acceptance criteria band ~~tolerance~~ allowed by the plant specific setpoint analysis. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it to within specification. If the trip setpoint is nonconservative with respect to the Allowable Value in Table 3.3.1-1, the channel is declared inoperable immediately, and the appropriate Condition(s) must be entered immediately. 5

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is not functioning as required, or the transmitter, instrument loop, signal processing electronics, or RPS bistable trip unit is found inoperable, then all affected Functions provided by that channel must be declared inoperable, and the plant must enter the Condition for the particular protection Function affected.

When the number of inoperable channels in a trip Function exceeds that specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

A Note has been added to the ACTIONS to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function. The Completion Times of each inoperable Function will be tracked separately for each Function, starting from the time the Condition was entered.

BASES

ACTIONS (continued)

A.1~~, A.2.1,~~ and A.2~~.2~~ 9

Condition A applies to the failure of a single channel in any RPS automatic trip Function. RPS coincidence logic is normally two-out-of-four.

If one RPS bistable trip unit or associated instrument channel is inoperable, startup or power operation is allowed to continue, providing the inoperable trip unit is placed in bypass or trip within 1 hour (Required Action A.1). With one channel in bypass, no additional random failure of a single channel could spuriously trip the reactor and a valid trip signal can still trip the reactor. With one channel in trip, an additional random failure of a single channel could spuriously trip the reactor. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to restore, bypass, or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel while ensuring that the risk involved in operating with the failed channel is acceptable.

Insert 1

~~The failed channel is restored to OPERABLE status or is placed in trip within [48] hours [or in accordance with the Risk Informed Completion Time Program] (Required Action A.2.1 or Required Action A.2.2). Required Action A.2.1 restores the full capability of the Function.~~

~~[Required Action A.2.2 places the Function in a one-out-of-three configuration. In this configuration, common cause failure of dependent channels cannot prevent trip.]~~ 9

~~The Completion Time of [48] hours is based on operating experience, which has demonstrated that a random failure of a second channel occurring during the [48] hour period is a low probability event.~~

B.1 ~~and B.2~~ 9

Condition B applies to the failure of two channels in any RPS automatic trip Function.

Required Action B.1 provides for placing one inoperable channel in bypass and the other channel in trip within the Completion Time of 1 hour. This Completion Time is sufficient to allow the operator to take all appropriate actions for the failed channels while ensuring that the risk involved in operating with the failed channels is acceptable. With one channel of protective instrumentation bypassed, the RPS is in a two-out-of-three logic; but with another channel failed, the RPS may be operating

9 1

INSERT 1

Additionally, the failed channel must be restored to OPERABLE status prior to entering MODE 2 following the next MODE 5 entry. The Completion Time of Required Action A.2 is based on adequate channel to channel independence, which allows a two-out-of-three channel operation since no single failure will cause or prevent a reactor trip. However, it is expected that the inoperable channel will be restored to OPERABLE status at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying restoration of the channel as well as any plant configuration changes required or shutting the plant down to repair the channel) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to repair the channel. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Condition A is modified by a Note requiring Required Action A.2 to be completed whenever the Condition is entered even when the LCO is no longer applicable to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions.

BASES

ACTIONS (continued)

in a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the RPS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, the reactor will trip.

Insert 2

~~One channel should be restored to OPERABLE status within [48] hours [or in accordance with the Risk Informed Completion Time Program] for reasons similar to those stated under Condition A. After one channel is restored to OPERABLE status, the provisions of Condition A still apply to the remaining inoperable channel. Therefore, the channel that is still inoperable after completion of Required Action B.2 must be placed in trip if more than [48] hours have elapsed since the initial channel failure.~~ 9

C.1 and C.2

The excore detectors are used to generate the internal ASI used as an input to the TM/LP and Local Power Density ~~APD~~ - High trips. Incore detectors provide a more accurate measurement of ASI. If one or more excore detectors cannot be calibrated to match incore detectors, power is restricted or reduced during subsequent operations because of increased uncertainty associated with using uncalibrated excore detectors. 3

The Completion Time of 24 hours is adequate to perform the SR while minimizing the risk of operating in an unsafe condition.

D.1, D.2.1, D.2.2.1, and D.2.2.2

Condition D applies to one automatic bypass removal channel inoperable. If the bypass removal channel for any operating bypass cannot be restored to OPERABLE status, the associated RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected RPS channel must be declared inoperable, as in Condition A, and the bypass either removed or the bypass removal channel repaired. The Bases for Required Actions and Completion Times are the same as discussed for Condition A.

E.1, E.2.1, and E.2.2

Condition E applies to two inoperable automatic bypass removal channels. If the bypass removal channels cannot be restored to OPERABLE status, the associated RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected

9 **INSERT 2** 1

One of the two inoperable channels will need to be restored to OPERABLE status prior to the next required CHANNEL FUNCTIONAL TEST, because channel surveillance testing on an OPERABLE channel requires that the OPERABLE channel be placed in bypass. However, it is not possible to bypass more than one RPS channel and placing a second channel in trip will result in a reactor trip. Therefore, if one RPS channel is in trip and a second channel is in bypass, a third inoperable channel would place the unit in LCO 3.0.3.

BASES

ACTIONS (continued)

RPS channels must be declared inoperable, as in Condition B, and the bypass either removed or the bypass removal channel repaired. Also, Required Action E.2.2 provides for the restoration of the one affected automatic trip channel to OPERABLE status within the rules of Completion Time specified under Condition B. Completion Times are consistent with Condition B.

F.1

Condition F is entered when the Required Action and associated Completion Time of Conditions A, B, C, D, or E are not met for the ~~Axial Power Distribution~~ Local Power Density and Loss of Load Trip Functions. 1

If the Required Actions associated with these Conditions cannot be completed within the required Completion Times, the reactor must be brought to a MODE in which the Required Actions do not apply. The allowed Completion Time of 6 hours to reduce THERMAL POWER to < 15% RTP is reasonable, based on operating experience, to decrease power to < 15% RTP from full power conditions in an orderly manner and without challenging plant systems.

G.1

Condition G is entered when the Required Action and associated Completion Time of Conditions A, B, C, D, E, or F are not met.

If the Required Actions associated with these Conditions cannot be completed within the required Completion Times, the reactor must be brought to a MODE in which the Required Actions do not apply. The allowed Completion Time of 6 hours to be in MODE 3 is reasonable, based on operating experience, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The SRs for any particular RPS Function are found in the SR column of Table 3.3.1-1 for that Function. Most Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION, and response time testing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~In order for a plant to take credit for topical reports as the basis for justifying Frequencies, topical reports must be supported by an NRC staff SER that establishes the acceptability of each topical report for that plant (Ref. 9).~~
~~-----~~

~~-----REVIEWER'S NOTE-----~~
~~Notes a and b are applied to the setpoint verification Surveillances for each RPS Instrumentation – Operating (Analog) Function in Table 3.3.1-1 unless one or more of the following exclusions apply:~~

1. ~~Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~

2. ~~Settings associated with safety relief valves are excluded. The performance of these components is already controlled (i.e., trended with as-left and as-found limits) under the ASME Code for Operation and Maintenance of Nuclear Power Plants testing program.~~

3. ~~Functions and Surveillance Requirements which test only digital components are normally excluded. There is no expected change in result between SR performances for these components. Where separate as-left and as-found tolerance is established for digital component SRs, the requirements would apply.~~

~~-----~~

3

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

1 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 transmitter or the signal processing equipment has drifted outside its limits.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

SR 3.3.1.2

A daily calibration (heat balance) is performed when THERMAL POWER is ≥ 15 ~~20~~%. The daily calibration shall consist of adjusting the "nuclear power calibrate" potentiometers to agree with the calorimetric calculation ~~if the absolute difference is > 1.5%~~. The "ΔT power calibrate" potentiometers are then used to null the "nuclear power - ΔT power" indicators on the RPS Reactor Power Calibration and Indication panel. Performance of the daily calibration ensures that the two inputs to the Q power measurement are indicating accurately with respect to the much more accurate secondary calorimetric calculation. 1 1

~~[The Frequency of 24 hours is based on plant operating experience and takes into account indications and alarms located in the control room to detect deviations in channel outputs.~~ 3

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

15 The Frequency is modified by a Note indicating this Surveillance must be performed within 12 hours after THERMAL POWER is ≥ ~~2~~0% RTP. The secondary calorimetric is inaccurate at lower power levels. The 12 hours allows time requirements for plant stabilization, data taking, and instrument calibration. 1

A second Note indicates the daily calibration may be suspended during PHYSICS TESTS. This ensures that calibration is proper preceding and following physics testing at each plateau, recognizing that during testing, changes in power distribution and RCS temperature may render the calorimetric inaccurate.

SR 3.3.1.3

It is necessary to calibrate the excore power range channel upper and lower subchannel amplifiers such that the internal ASI used in the TM/LP and Local Power Density ~~APD~~ - High trips reflects the true core power distribution as determined by the incore detectors. 1 A Note to the Frequency indicates the Surveillance is required within 12 hours after THERMAL POWER is ≥ 15 ~~[20]~~% RTP. Uncertainties in the excore and incore measurement process make it impractical to calibrate when THERMAL POWER is < 15 ~~[20]~~% RTP. The Completion Time of 12 hours allows time for plant stabilization, data taking, and instrument calibration. If the excore detectors are not properly calibrated to agree with the incore detectors, power is restricted during subsequent operations because of increased uncertainty associated with using uncalibrated excore detectors. ~~[The 31 day Frequency is adequate, based on operating experience of the excore linear amplifiers and the slow burnup of the detectors. The excore readings are a strong function of the power produced in the peripheral fuel bundles and do not represent an integrated reading across the core. Slow changes in neutron flux during the fuel cycle can also be detected at this Frequency.~~ 3

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 4 3

SR 3.3.1.4

A CHANNEL FUNCTIONAL TEST is performed on each RPS instrument channel, except Loss of Load and Power Rate of Change to ensure the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

In addition to power supply tests, The RPS CHANNEL FUNCTIONAL TEST consists of three overlapping tests as described in Reference ~~8~~ 9. These tests verify that the RPS is capable of performing its intended function, from bistable input through the RTCBs. They include: 1

Bistable Tests

The bistable setpoint must be found to trip conservative with respect to the Allowable Values specified in the LCO and left set consistent with the assumptions of the plant specific setpoint analysis (Ref. ~~7~~ 8). As-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference 10.

A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified ~~tolerance~~ acceptance criteria around the setpoint. This is done with the affected RPS channel trip channel bypassed. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis. 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~. Where a setpoint 5 more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance 3 procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, 5 will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and~~/or~~ Analytical Limit is 1 maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band ~~-~~of the ~~[LTSP]~~ NTSP, then the channel shall be 3 5 declared inoperable.

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 3 5

Matrix Logic Tests

Matrix Logic tests are addressed in LCO 3.3.~~3~~2. This test is performed 1 one matrix at a time. It verifies that a coincidence in the two input channels for each Function removes power from the matrix relays. During testing, power is applied to the matrix relay test coils and prevents the matrix relay contacts from assuming their de-energized state. This test will detect any short circuits around the bistable contacts in the coincidence logic, such as may be caused by faulty bistable relay or trip channel bypass contacts.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trip Path Tests

2

Trip Path (Initiation Logic) tests are addressed in LCO 3.3.~~3~~. These tests are similar to the Matrix Logic tests, except that test power is withheld from one matrix relay at a time, allowing the initiation circuit to de-energize, opening the affected set of RTCBs. The RTCBs must then be closed prior to testing the other three initiation circuits, or a reactor trip may result. 1

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 10).~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

SR 3.3.1.5

acceptance criteria band

A CHANNEL CALIBRATION of the excore power range channels ensures that the channels are reading accurately and within ~~tolerance~~. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis. 5

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference ~~[~~10~~]~~. 3

A Note is added stating that the neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by

BASES

SURVEILLANCE REQUIREMENTS (continued)

performing the ~~daily~~ calorimetric calibration (SR 3.3.1.2) and the ~~monthly~~ 1
linear subchannel gain check (SR 3.3.1.3). In addition, associated control room indications are continuously monitored by the operators.

~~[The Frequency of 92 days is acceptable, based on plant operating experience, and takes into account indications and alarms available to the operator in the control room.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

SR 3.3.1.5 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found acceptance criteria band ~~tolerance~~ but conservative with respect to the Allowable Value. 5
Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~. Where a setpoint 5
more conservative than the ~~[LTSP]~~ is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found acceptance criteria bands ~~tolerances~~, as applicable, 5
will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~, then the channel shall be declared inoperable. 3 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

NTSP

acceptance criteria band

The second Note also requires that ~~[LTSP]~~ and the methodologies for calculating the as-left and the as-found ~~tolerances~~ be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. 3 5

the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively

SR 3.3.1.6

A CHANNEL FUNCTIONAL TEST on the Loss of Load and Power Rate of Change channels is performed prior to a reactor startup to ensure the entire channel will perform its intended function if required. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. ~~The Loss of Load pressure sensor cannot be tested during reactor operation without closing the high pressure TSV, which would result in a turbine trip or reactor trip. The Power Rate of Change - High trip Function is required during startup operation and is bypassed when shut down or > 15% RTP.~~ 1

acceptance criteria band

SR 3.3.1.6 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ of the ~~[LTSP]~~. Where a setpoint more conservative than the ~~[LTSP]~~ is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ of the ~~[LTSP]~~, then the channel shall be declared inoperable. 5 5 3 5

acceptance criteria band

NTSP

acceptance criteria bands

acceptance criteria band

NTSP

BASES

SURVEILLANCE REQUIREMENTS (continued)

NTSP

acceptance criteria bands

The second Note also requires that ~~[LTSP]~~ and the methodologies for calculating the as-left and the as-found ~~tolerances~~ be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. 3 5

the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively

SR 3.3.1.7

SR 3.3.1.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.1.4, except SR 3.3.1.7 is applicable only to bypass Functions and is performed once within 92 days prior to each startup. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Proper operation of bypass permissives is critical during plant startup because the bypasses must be in place to allow startup operation and must be removed at the appropriate points during power ascent to enable certain reactor trips. Consequently, the appropriate time to verify bypass removal function OPERABILITY is just prior to startup. The allowance to conduct this test within 92 days of startup is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 10). Once the operating bypasses are removed, the bypasses must not fail in such a way that the associated trip Function gets inadvertently bypassed. This feature is verified by the trip Function CHANNEL FUNCTIONAL TEST, SR 3.3.1.4. Therefore, further testing of the bypass function after startup is unnecessary.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a CHANNEL CALIBRATION.

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the frequency extension analysis. The requirements for this review are outlined in Reference ~~[~~10~~]~~. 3

SR 3.3.1.8 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). 5 Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition.

The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP~~ NTSP]. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable. 5 5 3 5

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 5 3

~~[The Frequency is based upon the assumption of an 18 month calibration interval for the determination of the magnitude of equipment drift.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

The Surveillance is modified by a Note to indicate that the neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by performing the calorimetric calibration (SR 3.3.1.2) and the linear subchannel gain check (SR 3.3.1.3).

SR 3.3.1.9

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. ~~[Response times are conducted on an [18] month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 18 months, where n is the number of channels in the function. The Frequency of [18] months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

4

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

Testing may be performed in one measurement or in overlapping segments, with verification that all components are tested.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following TS Bases are applicable to plants adopting CEOG Topical Report CE NPSD-1167-1, "Elimination of Pressure Sensor Response Time Testing Requirements," and the methodology contained in Attachment 1 to TSTF-569.~~
~~--~~

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 11) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. The response time may be verified for components that replace the components that were previously evaluated in Ref. 11 provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 12). Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration (SR 3.3.1.2).

REFERENCES

1. Technical Requirements Manual (TRM)

~~1~~ 2. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation."

~~2~~ 3. 10 CFR 50, Appendix A, GDC 21.

~~3~~ 4. 10 CFR ~~100~~ 50.67.

~~4~~ 5. IEEE Standard 279-1971, April 5, 1972.

BASES

REFERENCES (continued)

~~5~~ 6. U FSAR, Chapter ~~[14]~~ 15.

~~6~~ 7. 10 CFR 50.49.

~~7~~ 8. IC-3.17, “Instrument Setpoint Methodology for Nuclear Power Plants” ~~"Plant Protection System Selection of Trip Setpoint Values."~~

~~8~~ 9. U FSAR, Section ~~[~~7.2~~]~~.

~~9. NRC Safety Evaluation Report, [Date].~~

10. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

11. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

12. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing."

BASES

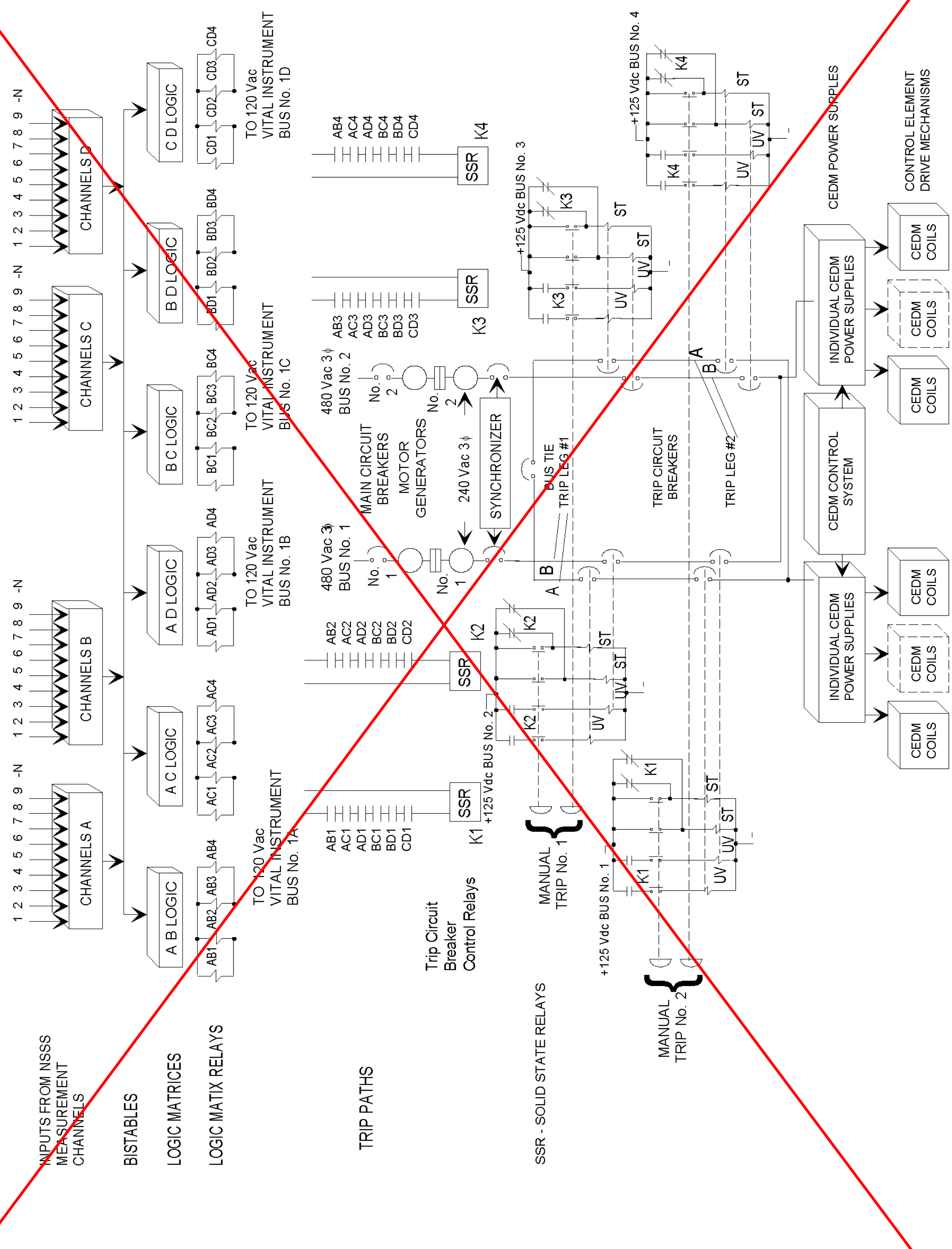

Figure B 3.3.1-1 (page 1 of 1)
Functional Diagram of the Two-Out-of-Four Logic and RTCB Configuration

6

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.1 BASES, REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.3 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. PSL does not use the terms “as-found tolerance” and “Limiting Trip Setpoint (LTSP)” in plant specific instrument calculations or the Updated Final Safety Analysis Report. Therefore, the use of these terms in Footnotes (a) and (b) in ISTS Table 3.3.1-1 are revised in the ITS to include the plant specific terminology. To comply with the guidance provided in NRC Regulatory Issue Summary 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” the PSL setpoint calculations have been structured to include a Nominal Trip Setpoint (NTSP), also known as the field trip setpoint, and determination of an OPERABILITY limit range, referred to in CTS as acceptance criteria band. For PSL, the Nominal Trip Setpoint (NTSP) is synonymous with the Limiting Trip Setpoint (LTSP) and the as-found acceptance criteria band (i.e., OPERABILITY limit range) is synonymous with the as-found tolerance.

6. Figure B 3.3.1-1 is removed because the figure is included in the UFSAR.

7. Editorial clarification.

8. Changes made to reflect changes made to the Specification consistent with the current licensing basis as approved in License Amendment 243 (Unit 1) and Amendment 194 (Unit 2), dated October 31, 2017 (NRC ADAMS Accession Number ML17257A015).

9. Changes made to reflect changes made to the Specification consistent with the current licensing basis with Bases of ACTIONS A and B adapted from the Bases ISTS Specification 3.3.1 (Digital), and the Bases of Specification SR 3.0.3.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 2

3.3.2, Reactor Protective System (RPS) Logic and Trip Initiation

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

3/4.3 INSTRUMENTATION

SYSTEM (RPS) LOGIC AND TRIP INITIATION

3/4.3.1 REACTOR PROTECTIVE ~~INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.2

A02

3.3.1.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1~~ shall be OPERABLE.

Six channels of RPS Matrix Logic, four channels of RPS Initiation Logic, four channels of reactor trip circuit breakers (RTCB)s, and four channels of Manual Trip

M01

Applicability

APPLICABILITY: ~~As shown in Table 3.3-1.~~

MODES 1 and 2,
MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

A03

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1
SR 3.3.2.2
SR 3.3.2.3

4.3.1.1.1 Each ~~reactor protective instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the ~~CHANNEL CHECK, CHANNEL CALIBRATION and~~ CHANNEL FUNCTIONAL TEST ~~operations during the modes and at the frequencies shown in Table 4.3-1~~.

A01

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. Each test shall include at least one channel per function.

See ITS 3.3.1

Add proposed SR 3.3.2.4

M02

TABLE 3.3-1

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SYSTEM (RPS) LOGIC AND TRIP INITIATION

MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn

A03

LA01

FUNCTION~~AL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
LCO 3.3.2 Applicability ACTION A 1. Manual Reactor Trip	4 ~~2~~	~~1~~	4 ~~2~~	1, 2 and ~~*~~	1
2. Power Level – High	4	2(a)	3(f)	1, 2	2
3. Reactor Coolant Flow – Low	4/SG	2(a)/SG	3/SG	1, 2 (e)	2
4. Pressurizer Pressure – High	4	2	3	1, 2	2
5. Containment Pressure – High	4	2	3	1, 2	2
6. Steam Generator Pressure – Low	4/SG	2(b)/SG	3/SG	1, 2	2
7. Steam Generator Water Level – Low	4/SG	2/SG	3/SG	1, 2	2
8. Local Power Density – High	4	2(c)	3	1	2
9. Thermal Margin/Low Pressure	4	2(a)	3	1, 2 (e)	2
9a. Steam Generator Pressure Difference – High	4	2(a)	3	1, 2 (e)	2
10. Loss of Turbine – Hydraulic Fluid Pressure - Low	4	2(c)	3	1	2

A02

See ITS 3.3.1

TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SYSTEM (RPS) LOGIC AND TRIP INITIATION

LA01

	FUNCTION~~AL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	11. Wide Range Logarithmic Neutron Flux Monitor						
	a. Startup and Operating -- Rate of Change of Power – High	4	2(d)	3	1**, 2 and *	2	See ITS 3.3.1
	b. Shutdown	4	0	2	3, 4, 5	3	See ITS 3.3.11
LCO 3.3.2 Applicability ACTION B	12. ~~Reactor Protection System~~ RPS initiation logic Logic	~~4~~	~~2~~	4	1, 2~~*~~	4	A03
LCO 3.3.2 Applicability ACTION B	13. Reactor Trip Circuit Breakers RTCBs	~~4~~	~~2~~	4	1, 2~~*~~	4	

MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn

TABLE 3.3-1 (Continued)

TABLE NOTATION

any RTCBs

any

Applicability * With ~~the protective system trip breakers in the~~ closed ~~position~~ and ~~the~~ CEA ~~drive system~~ capable of ~~CEA~~ withdrawal.

being

A03

** Mode 1 applicable only when Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER. (a) Trip may be bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 1% of RATED THERMAL POWER. (b) Trip may be manually bypassed below 685 psig; bypass shall be automatically removed at or above 685 psig. (c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is ≥ 15% of RATED THERMAL POWER. (d) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is ≥ 10^{-4}% and Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER. (e) Deleted. (f) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.

See ITS 3.3.1

ACTION STATEMENTS

One manual trip channel inoperable in MODE 1 or 2

ACTION A (Manual Trip)

ACTION E (Manual Trip)

ACTION 1 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement,~~ restore ~~the inoperable channel~~ to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in HOT STANDBY within the next 6 hours and/~~or~~ open the protective system trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied: a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY; however, the inoperable channel shall then be either restored to OPERABLE status or placed in the tripped condition.

See ITS 3.3.1

Add proposed ACTION A (Matrix Logic) M01

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

b. Within one hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on than channel provided the other inoperable channel is placed in the tripped condition.

See ITS 3.3.1

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

See ITS 3.3.11

ACTION B (RTCBs and Initiation Logic)

One channel RTCB or initiation logic inoperable in MODE 1 or 2.

ACTION 4 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.1~~. open the affected RTCBs within 1 hour

L01

LA02

Add proposed ACTION C M03

Add proposed ACTION D M03

Add proposed ACTION E (for Initiation Logic, RTCBs and second condition) M04

TABLE 4.3-1

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SURVEILLANCE REQUIREMENTS

SYSTEM (RPS) LOGIC AND TRIP INITIATION

	FUNCTIONAL~~AL UNIT~~	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
SR 3.3.2.3	1. Manual Reactor Trip	N/A	N.A.	S/U(1)	N/A	
	2. Power Level – High					
	a. Nuclear Power	SFCP	SFCP(2), SFCP(3), SFCP(5)	SFCP	1,2	
	b. ΔT Power	SFCP	SFCP(4), SFCP	SFCP	1	
	3. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	
	4. Pressurizer Pressure – High	SFCP	SFCP	SFCP	1, 2	
	5. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2	
	6. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2	See ITS 3.3.1
	7. Steam Generator Water Level – Low	SFCP	SFCP	SFCP(6, 7)	1, 2	
	8. Local Power Density – High	SFCP	SFCP	SFCP	1	
	9. Thermal Margin/Low Pressure	SFCP	SFCP	SFCP	1, 2	
	9a. Steam Generator Pressure Difference – High	SFCP	SFCP	SFCP	1, 2	
	10. Loss of Turbine -- Hydraulic Fluid Pressure – Low	N.A.	N.A.	S/U(1)	N.A.	
	11. Wide Range Logarithmic Neutron Flux Monitor	SFCP	N.A.	S/U(1)	1, 2, 3, 4, 5 and *	
SR 3.3.2.2 Applicability	12. ~~Reactor Protection System~~ RPS initiation logic Logic	N.A.	N.A.	SFCP ~~and S/U(1)~~	1, 2 and *	L02
SR 3.3.2.1 Applicability	13. Reactor Trip Circuit Breakers RTCBs	N.A.	N.A.	SFCP	1, 2 and *	

TABLE 4.3-1 (Continued)

TABLE NOTATION

Applicability * - With reactor trip breaker closed.

~~(1) - If not performed in previous 7 days.~~

L02

(2) - Heat balance only, above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometer to null "Nuclear Pwr – ΔT Pwr." During PHYSICS TESTS, these daily calibrations of nuclear power and ΔT power may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(3) - Above 15% of RATED THERMAL POWER, recalibrate the excore detectors which monitor the AXIAL SHAPE INDEX by using the incore detectors or restrict THERMAL POWER during subsequent operations to $\leq$ 90% of the maximum allowed THERMAL POWER level with the existing Reactor Coolant Pump combination.

(4) - Adjust "ΔT Pwr Calibrate" potentiometers to make ΔT power signals agree with calorimetric calculation.

(5) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(6) - If the as-found setpoint is either outside its predefined as-found acceptance criteria band or is not conservative with respect to the Allowable Value, then the channel shall be declared inoperable and shall be evaluated to verify that it is functioning as required before returning the channel to service.

(7) - The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Field Trip Setpoint, otherwise that channel shall not be returned to OPERABLE status. The Field Trip Setpoint and the methodology used to determine the Field Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in the UFSAR Section 7.2.

See ITS 3.3.1

3/4.3 INSTRUMENTATION

SYSTEM (RPS) LOGIC AND TRIP INITIATION

3/4.3.1 REACTOR PROTECTIVE ~~INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.2 3.3.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1~~ shall be OPERABLE.

Six channels of RPS Matrix Logic, four channels of RPS Initiation Logic, four channels of reactor trip circuit breakers (RTCB)s, and four channels of Manual Trip

M01

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-1.~~

MODES 1 and 2,
MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1
SR 3.3.2.2
SR 3.3.2.3

4.3.1.1 Each ~~reactor protective instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the ~~CHANNEL CHECK, CHANNEL CALIBRATION and~~ CHANNEL FUNCTIONAL TEST ~~operations for the MODES and at the frequencies shown in Table 4.3-1~~.

A01

4.3.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. Each test shall include at least one channel per function.

See ITS 3.3.1

ITS

A01

TABLE 3.3-1

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SYSTEM (RPS) LOGIC AND TRIP INITIATION

LA01

ITS	FUNCTION~~AL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
ACTION A ACTION C ACTION D	1. Manual Reactor Trip	4 4	~~2~~ ~~2~~	4 4	1, 2 3*, 4*, 5*	1 5	
	2. Variable Power Level – High	4	2(a)(d)	3	1, 2	2	See ITS 3.3.1
	3. Pressurizer Pressure – High	4	2	3	1, 2	2	
	4. Thermal Margin/Low Pressure	4	2(a)(d)	3	1, 2	2	
	5. Containment Pressure – High	4	2	3	1, 2	2	
	6. Steam Generator Pressure – Low	4/SG	2/SG(b)	3/SG	1, 2	2	
	7. Steam Generator Pressure Difference – High	4	2(a)(d)	3	1, 2	2	
	8. Steam Generator Level – Low	4/SG	2/SG	3/SG	1, 2	2	
	9. Local Power Density – High	4	2(c)(d)	3	1	2	
	10. Loss of Component Cooling Water to Reactor Coolant Pumps	4	2	3	1, 2	2	
ACTION B ACTION C	11. ~~Reactor Protection System~~ RPS initiation logic Logic	~~4~~	~~2~~	~~3~~ 4	1, 2 3*, 4*, 5*	2 5	A04
ACTION B ACTION C	12. Reactor Trip Circuit Breakers RTCBs	~~4~~	~~2(f)~~	4	1, 2 3*, 4*, 5*	4 5	
	13. Wide Range Logarithmic Neutron Flux Monitor a. Startup and Operating – Rate of Change of Power – High	4	2(e)(g)	3	1**, 2	2	See ITS 3.3.1
	b. Shutdown	4	0	2	3, 4, 5	3	See ITS 3.3.11
	14. Reactor Coolant Flow – Low	4/SG	2/SG(a)(d)	3/SG	1, 2	2	See ITS 3.3.1
	15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	4	2(c)	3	1	2	

TABLE 3.3-1 (Continued)

TABLE NOTATION

any RTCBs

and any

Applicability * With ~~the protective system trip breakers in the~~ closed ~~position, the~~ CEA ~~drive system~~ capable of ~~CEA~~ withdrawal~~, and fuel in the reactor vessel~~.

being

A05

See ITS 3.3.1

** Mode 1 applicable only when Power Range Neutron Flux power ≤ 15% of RATED THERMAL POWER.

(a) Trip may be manually bypassed below 0.5% of RATED THERMAL POWER in conjunction with (d) below; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is greater than or equal to 0.5% of RATED THERMAL POWER.

(b) Trip may be manually bypassed below 705 psig; bypass shall be automatically removed at or above 705 psig.

(c) Trip may be bypassed below 15% of RATED THERMAL POWER; bypass shall be automatically removed when Power Range Neutron Flux power is greater than or equal to 15% of RATED THERMAL POWER.

(d) Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.

(e) Trip may be bypassed below 10^{-4}% and above 15% of RATED THERMAL POWER; bypass shall be automatically removed when Wide Range Logarithmic Neutron Flux power is $\geq 10^{-4}$% and Power Range Neutron Flux power $\leq$ 15% of RATED THERMAL POWER.

(f) ~~Each channel shall be comprised of two trip breakers; actual trip logic shall be one-out-of-two taken twice.~~

LA03

(g) There shall be at least two decades of overlap between the Wide Range Logarithmic Neutron Flux Monitoring Channels and the Power Range Neutron Flux Monitoring Channels.

See ITS 3.3.1

ACTION STATEMENTS

One manual trip channel inoperable in MODE 1 or 2

ACTION A (Manual Trip)

ACTION 1 - ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status~~ within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and~~/or~~ open the protective system trip breakers.

ACTION E (Manual Trip)

Add proposed ACTION A (Matrix Logic)

M01

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

One channel of Initiation Logic inoperable in MODE 1 or 2.

ACTION B (Initiation Logic)

ACTION 2 - a. ~~With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed in the bypassed or tripped condition~~ within 1 hour. ~~The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.~~

open the affected RTCBs

LA04

ACTION D (Initiation Logic Modes 1 and 2 only)

b. ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:~~

Two channels of Initiation Logic affecting the same trip leg inoperable in MODE 1 or 2.

1. ~~Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour.~~

M05

ACTION D (Initiation Logic Modes 1 and 2 only)

2. ~~All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition.~~

Open the affected RTCBs immediately.

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below:

Process Measurement Circuit	Functional Unit Bypassed
1. Safety Channel – Nuclear Instrumentation	
Wide Range	Rate of Change of Power – High (RPS)
Linear Range	Variable Power Level – High (RPS) Local Power Density – High (RPS) Thermal Margin/Low Pressure (RPS)
2. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Thermal Margin/Low Pressure (RPS) Pressurizer Pressure – Low (ESF)
3. Containment Pressure -	Containment Pressure – High (RPS) Containment Pressure – High (ESF)
4. Steam Generator Pressure -	Steam Generator Pressure – Low (RPS) Thermal Margin/Low Pressure (RPS) AFAS-1 and AFAS-2 (AFAS) Steam Generator Pressure – Low (ESF)
5. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)

See ITS 3.3.1

Add proposed ACTION D (for Manual Trip, RTCBs; and Initiation Logic in Modes 3, 4 and 5)

M03

Add proposed ACTION E (for Initiation Logic and second Condition)

M04

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

See ITS 3.3.1

ACTION 2 - (Continued)

6.	Cold Leg Temperature	Variable Power Level – High (RPS) Thermal Margin/Low Pressure (RPS) Local Power Density – High (RPS)
7.	Hot Leg Temperature	Variable Power Level – High (RPS) Thermal Margin /Low Pressure (RPS) Local Power Density – High (RPS)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes*. Verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

See ITS 3.3.11

ACTION B (RTCBs)

ACTION 4 - One channel of RTCBs inoperable in MODE 1 or 2, open the affected RTCBs ~~With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirements, STARTUP and/or POWER OPERATION may continue provided the reactor trip breakers of the inoperable channel are placed in the tripped condition~~ within 1 hour,

ACTION E (RTCBs)

otherwise, be in at least HOT STANDBY within 6 hours; ~~however, one channel may be bypassed for up to 1 hour, provided the trip breakers of any inoperable channel are in the tripped condition, for surveillance testing per Specification 4.3.1.1.~~

LA02

ACTION 5 - One channel of Manual Trip, RTCBs, or Initiation Logic inoperable in MODE 3, 4, or 5 ~~With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement restore the inoperable channel to OPERABLE status~~ within 48 hours ~~or~~ open the ~~reactor trip breakers within the next hour~~ affected RTCBs.

ACTION C

M06

---

* Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

See ITS 3.3.11

TABLE 4.3-1

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SYSTEM (RPS) LOGIC AND TRIP INITIATION SURVEILLANCE REQUIREMENTS

	FUNCTION~~AL UNIT~~	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
SR 3.3.2.3	1. Manual Reactor Trip	N/A	N.A.	S/U(1)	1, 2, 3*, 4*, 5*	
	2. Variable Power Level – High					See ITS 3.3.1
	a. Nuclear Power	SFCP	SFCP(2), SFCP(3), SFCP(4)	SFCP	1,2	
	b. ΔT Power	SFCP	SFCP(5), SFCP(4)		1	
	3. Pressurizer Pressure – High	SFCP	SFCP	SFCP	1, 2	
	4. Thermal Margin/Low Pressure	SFCP	SFCP	SFCP	1, 2	
	5. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2	
	6. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2	
	7. Steam Generator Pressure Difference – High	SFCP	SFCP	SFCP	1, 2	
	8. Steam Generator Level – Low	SFCP	SFCP	SFCP(8, 9)	1, 2	
	9. Local Power Density – High	SFCP	SFCP	SFCP	1	
	10. Loss of Component Cooling Water to Reactor Coolant Pumps	N.A.	N.A.	SFCP	N.A.	
SR 3.3.2.2	11. ~~Reactor Protection System~~ RPS initiation logic Logic	N.A.	N.A.	SFCP~~(7)~~	1, 2, 3*, 4*, 5*	LA05

TABLE 4.3-1 (Continued)

SYSTEM (RPS) LOGIC AND TRIP INITIATION

REACTOR PROTECTIVE ~~INSTRUMENTATION~~ SURVEILLANCE REQUIREMENTS

	FUNCTION~~AL UNIT~~	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
SR 3.3.2.1 SR 3.3.2.4	12. Reactor Trip Circuit Breakers RTCBs	N.A.	N.A.	~~S/U(1),~~ SFCP, SFCP(6)	1, 2, 3*, 4*, 5*	L02
	13. Wide Range Logarithmic Neutron Flux Monitor	SFCP	SFCP	S/U(1),SFCP	1, 2, 3, 4, 5	See ITS 3.3.1
	14. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	
	15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	SFCP	N.A.	SFCP	1	

TABLE 4.3-1 (Continued)

TABLE NOTATION

* - Only if the reactor trip breakers are in the closed position and the CEA drive system is capable of CEA withdrawal.

~~(1) - Each startup or when required with the reactor trip breakers closed and the CEA drive system capable of rod withdrawal, if not performed in the previous 7 days.~~

L02

See ITS 3.3.1

(2) - Heat balance only (CHANNEL FUNCTIONAL TEST not included), above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometer to null "Nuclear Power – ΔT Power". During PHYSICS TESTS, these daily calibrations may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(3) - Above 15% of RATED THERMAL POWER, recalibrate the excore detectors which monitor the AXIAL SHAPE INDEX by using the incore detectors or restrict THERMAL POWER during subsequent operations to $\leq$ 90% of the maximum allowed THERMAL POWER level with the existing reactor coolant pump combination.

(4) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) - Adjust "ΔT Pwr Calibrate" potentiometers to make ΔT power signals agree with calorimetric calculation.

SR 3.3.2.4 (6) - In accordance with the Surveillance Frequency Control Program and following maintenance or adjustment of the reactor trip breakers, the CHANNEL FUNCTIONAL TEST shall include verification of the independent OPERABILITY of the undervoltage and shunt trips.

~~(7) - The fuse circuitry in the matrix fault protection circuitry shall be determined to be OPERABLE by testing with the installed test circuitry.~~

LA05

(8) - If the as-found channel setpoint is either outside its predefined as-found acceptance criteria band or is not conservative with respect to the Allowable Value, then the channel shall be declared inoperable and shall be evaluated to verify that it is functioning as required before returning the channel to service.

(9) - The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Field Trip Setpoint, otherwise that channel shall not be returned to OPERABLE status. The Field Trip Setpoint and the methodology used to determine the Field Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in UFSAR Section 7.2.

See ITS 3.3.1

DISCUSSION OF CHANGES
ITS 3.3.2, REACTOR PROTECTIVE SYSTEM (RPS) LOGIC AND INITIATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 **Unit 1 only:** CTS Table 3.3-1 Functional Unit 1 provides requirements for Manual Reactor Trip. The Total No. Of Channels and Minimum Channels Operable columns specify 2 channels. ITS LCO 3.3.2, in part, requires four channels of Manual Trip to be OPERABLE. This changes the CTS by requiring four Manual Reactor Trip channels instead of two channels.

The purpose of the required number of channels is to ensure a manual reactor trip can be initiated coincident with a single failure. As shown in UFSAR Figure 7.2-1, the Reactor Protective System manual trip function is comprised of two manual trip push buttons per Manual Trip circuit; Manual Trip #1 and #2. Two pushbuttons associated with either Manual Trip circuit are required to trip the reactor. CTS Table 3.3-1 Functional Unit 1 specifies a Manual Trip Circuit as a channel (i.e., Manual Trip #1 and #2). ISTS LCO 3.3.3 (ITS LCO 3.3.2) and the associated ACTIONS and Surveillances are formatted to address each individual manual trip push button as a channel. The PSL Unit 1 and Unit 2 manual reactor trip circuit design is consistent with the manual reactor trip circuit design discussed in the Bases of ISTS 3.3.3. The Background section of the ISTS 3.3.3 Bases states, in part, "Each set of RTCBs is operated by… a Manual Trip push button…. There are four Manual Trip push buttons, arranged in two sets of two…. Depressing both push buttons in either set will result in a reactor trip." Therefore, changing the minimum number of required channels from 2 to 4 results is an equivalent requirement; two sets of two manual push buttons must be OPERABLE and one set of two manual push buttons are required to initiate a manual reactor trip.

This change is a presentation preference and is consistent with NUREG-1432, Rev. 5 and PSL Unit 2 CTS Table 3.3-1 Functional Unit 1 Total No. of Channels and Minimum Channels Operable columns. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 **Unit 1 only**: CTS Table 3.3-1 lists the applicability of the RPS Manual Reactor Trip (Functional Unit 1) as MODES 1, 2 and * CTS Table 3.3-1 also lists the applicability of the Reactor Protective System Logic (Functional Unit 12) and Reactor Trip Breakers (Functional Unit 13) as MODES 1 and 2*. Footnote * provides the clarification that the applicability includes "with the protective system trip breakers in the closed position and the CEA drive system capable of CEA withdrawal." ITS 3.3.2 Applicability states MODES 1 and 2, and MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn. This changes the CTS by specifically adding MODES 3, 4, and 5 to the specific condition of with any RTCBs closed and any control element assemblies capable of being withdrawn

The purpose of the CTS Applicability is to ensure the RPS manual trip channel and logic and initiation instrumentation is also applicable when the plant is shutdown if the RTCBs are closed and the CEAs are capable of being withdrawn to ensure a withdrawn CEA can be inserted if required. Clarifying the Applicability of MODES 3, 4, and 5 avoids any confusion of the RPS requirements when the reactor vessel head is de-tensioned or removed (i.e., MODE 6). Other Technical Specifications (e.g., LCO 3.9.1, “Boron Concentration,”) ensure adequate Shutdown Margin is provided in MODE 6. This change is consistent with NUREG-1432, Rev. 5 and the Applicability for the same RPS Functions in Unit 2 CTS Table 3.3-1. This change is solely a clarification of the existing requirement and is designated as administrative because it does not result in technical changes to the CTS.

A04 **Unit 2 only**: Unit 2 CTS Table 3.3-1 Function 11 (Reactor Protection System Logic) requires 3 channels in the Minimum Channels Operable column for MODES 1 and 2. ITS 3.3.2 requires four channels for Function 11 (RPS Initiation Logic) to be OPERABLE for MODES 1 and 2. This changes the Unit 2 CTS to require four Reactor Protective System Logic (Function 11) channels instead of three channels.

The purpose of the required number of channels is to ensure the RPS Initiation Logic trip can be initiated coincident with a single failure. As shown in UFSAR Figure 7.2-1, the Reactor Protective System RPS Initiation Logic function is comprised of two channels per trip circuit. Changing the minimum number of required channels from 3 to 4 results in an equivalent requirement; two channels per trip circuit are required to satisfy single failure criteria.

This change is consistent with NUREG-1432, Rev. 5 and PSL Unit 2 CTS Table 3.3-1 Functional Unit 11 Total No. of Channels, Minimum Channels Operable, and Channels to Trip columns. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 **Unit 2 only:** CTS 3.3.1 Table 3.3-1 Footnote* states, in part. “and fuel in the reactor vessel.” ITS 3.3.2 does not include this detail related to an operational MODE. The ITS definition of a MODE states that a MODE, in part, with fuel in the reactor vessel. This changes the CTS by removing redundant information already addressed by the Technical Specification definitions.

The purpose of the statement regarding fuel in the reactor in CTS Table 3.3-1 Footnote * is to clarify that the Applicability applies with fuel in the reactor vessel. The equivalent ITS 3.3.2 Applicability clarifies the requirements are applicable in MODES 3, 4, and 5, which include fuel in the reactor vessel. The ITS definition of a MODE is defined, in part, with fuel in the reactor vessel. ITS 3.3.2 retains the requirement for the RPS Logic and Trip Initiation to be OPERABLE in MODES 3, 4, and 5 with any RTCBs closed and any control element assemblies capable of being withdrawn. This change is solely a presentation preference difference and is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 do not specifically identify the RPS Matrix Logic channels as a functional unit required to satisfy RPS logic OPERABILITY. ITS 3.3.2 requires six channels of RPS Matrix Logic to be OPERABLE. This changes CTS by specifically adding six channels of RPS Matrix Logic to the channel OPERABILITY requirements and adding the associated proposed ACTION for inoperable RPS Matrix Logic channels.

The proposed change results in more specific requirements for the RPS Logic and Trip Initiation channels including the actions to be taken for inoperability. The proposed change is acceptable because the matrix logic is currently part of the RPS logic and trip initiation system but are not specifically identified within the OPERABILITY requirements. ITS 3.3.2 specifically identifies the six RPS Matrix Logic channels as an LCO requirement. The PSL Unit 1 and Unit 2 RPS matrix logic design is consistent with the RPS matrix logic design discussed in the Bases of ISTS 3.3.3. ITS 3.3.2 ACTION A requires the inoperable channels to be restored to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program when one Matrix Logic channel is inoperable or when three Matrix Logic channels are inoperable due to a common power source failure de-energizing three matrix power supplies. The Completion Time of 48 hours provides the operator time to take appropriate actions and still ensures that any risk involved in operating with a failed channel is acceptable. Operating experience has demonstrated that the probability of a random failure of a second Matrix Logic channel is low during any given 48 hour interval. By providing specific requirements for the six RPS Matrix Logic channels, the proposed change provides additional assurance that the RPS function is available when required. This change conforms the PSL CTS to the ISTS. This change is considered a more restrictive change because additional specific requirements have been added that are not required by the CTS.

M02 **Unit 1 only**: CTS 3.3.1.1 does not have a specific surveillance requirement that requires an additional CHANNEL FUNCTIONAL TEST that includes a separate verification of the undervoltage and shunt trips on each RTCB channel. ITS SR 3.3.2.4 requires the performance of a CHANNEL FUNCTIONAL TEST, including separate verification of the undervoltage and shunt trips on each RTCB channel in accordance with the SFCP. This changes the CTS by adding an additional surveillance requirement ITS SR 3.3.2.4.

The purpose of SR 3.3.2.4 is to individually test all four sets of undervoltage coils and all four sets of shunt trip coils. This change is acceptable because it ensures that every undervoltage coil and every shunt trip coil is capable of performing its intended function and that no single failure of an RTCB component will prevent a reactor trip. PSL controls periodic Frequencies for Surveillances in accordance with the SFCP per CTS 6.8.4.o (Unit 1) and CTS 6.8.4.q (Unit 2). Therefore, the initial Frequency in accordance with the Surveillance Frequency Control Program will be specified as 18 months consistent with ISTS 3.3.3.4 and based on the need to perform the 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.

The SFCP was established as described in FPL (PSL Unit 1 and Unit 2) “Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program” (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066).

This change is acceptable and is designated as more restrictive since the CTS does not currently require this verification for the undervoltage and shunt trips on each RTCB channel.

M03 Unit 1 CTS 3.3.1.1 does not provide specific Actions for one or two inoperable channels of Manual Trip, RTCBs, or Initiation Logic. Unit 2 CTS 3.3.1 does not provide specific Actions for two channels of Manual Trip, RTCBs, or Initiation Logic affecting the same trip leg inoperable when in MODES 3, 4, and 5. ITS 3.3.2 ACTION C requires affected RTCBs to be opened within 48 hours with one channel of Manual Trip, RTCBs, or Initiation Logic inoperable in MODE 3, 4, or 5. ITS 3.3.2 ACTION D requires the affected RTCBs to be opened immediately with two channels of Manual Trip, RTCBs, or Initiation Logic affecting the same trip leg inoperable when in any required MODE of applicability. This changes Unit 1 CTS 3.3.1.1 by adding specific ACTIONs (ITS 3.3.2 ACTION C) for one channel inoperable in MODE 3, 4, or 5 and (ITS 3.3.2 ACTION D) for two channels of Manual Trip, RTCBs, or Initiation Logic affecting the same trip leg inoperable for all applicable MODES; and, changes Unit 2 CTS 3.3.1 by adding a specific ACTION (ITS 3.3.2 ACTION D) for two channels of Manual Trip, RTCBs, or Initiation Logic channel affecting the same trip leg inoperable for MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

The purpose of ITS 3.3.2 ACTION C is to remove the need for the affected channel by performing its associated safety function. The purpose of ITS 3.3.2 ACTION D is to allow for a single failure within a trip leg when one or both trip function channels in the same trip leg fails in a non-trip condition. This change is acceptable because with both trip channels of a trip function in the same trip leg inoperable opening of the affected RTCBs ensures the trip capability is maintained. This change is considered a more restrictive change because additional requirements have been added to the CTS.

M04 Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 do not provide specific Actions when the Action and Completion time for more than one Initiation Logic or RTCB channel inoperable. ITS ACTION E requires the unit to be placed in MODE 3 in 6 hours and all RTCBs opened in 6 hours when the Required Action and Associated Completion Time of Condition A (manual trip channel or matrix logic channel inoperable), Condition B (RTCB or Initiation Logic channel inoperable) or

Condition D (two channels affecting the same trip leg inoperable) are not met or "one or more Functions with two or more Manual Trip, Matrix Logic, Initiation Logic, or RTCB channels inoperable for reasons other than Condition A or D." This changes the CTS by adding Action E in its entirely for the Initiation Logic and RTCB functions and adding the second Condition for the manual trip function.

The purpose of ITS ACTION E is to place the unit in a MODE where the LCO does not apply and ensuring no CEA withdrawal occurs when Required Actions and associated Completion Times are not met or when one or more Functions have two or more channels inoperable for reasons other than Condition A or D. This change is acceptable because the ACTIONS specified in ITS 3.3.2 adopt ISTS for placing the unit outside the MODE of applicability. A Completion Time of 6 hours is reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems and to open RTCBs. This change is considered a more restrictive change because additional requirements have been added to the CTS.

M05 **Unit 2 only:** CTS 3.3.1 Table 3.3-1 ACTION 2b. with two Reactor Protective System Logic channels inoperable, states, "Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour." ITS 3.3.2 ACTION D requires the affected RTCBs to be opened immediately with two channels of RPS Initiation Logic channel affecting the same trip leg inoperable. This changes Unit 2 CTS 3.3.1 by requiring the affected RTCBs to be opened immediately. The purpose of ITS 3.3.2 ACTION D is to allow for a single failure within a trip leg when one or both trip function channels in the same trip leg fails in a non-trip condition. This change is necessary because with both trip channels of a trip function in the same trip leg inoperable, opening of the affected RTCBs ensures the trip capability is maintained. This change is considered a more restrictive change because a more restrictive completion time is required to open the RTCBs than is required in the CTS.

M06 **Unit 2 only**: CTS 3.3.1 Table 3.3-1 ACTION 5 requires that with one channel of Manual Trip, RTCBs, or RPS Initiation Logic inoperable in MODE 3, 4, or 5 that the inoperable channel be restored within 48 hours or the reactor trip breakers must be opened within the next hour (total of 49 hours). ITS 3.3.2 ACTION C for the same condition that the affected RTCBs be opened in 48 hours. This changes the Unit 2 CTS by changing the time to open the RTCBs from 49 hours to 48 hours. This change is considered a more restrictive change because a more restrictive completion time is required to open the RTCBs than is required in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 for RPS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS 3.3.2 does not retain these columns but retains the requirements in the MINIMUM CHANNELS OPERABLE column in the LCO. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.3.1.1 ACTION 4 and Unit 2 CTS 3.3.1 ACTION 4 states, in part. “one channel may be bypassed for up to 1 hour for surveillance testing.” The equivalent ITS 3.3.2 ACTION B requires the affected RTCBs to be opened in 1 hour. ITS 3.3.2 does not include these procedural details because the channel may continue to be bypassed under the ITS ACTION A. This changes the CTS by moving the procedural detail to the ITS Bases.

The removal of these details, related to methods of surveillance test performance, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specifications Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to methods of surveillance test performance is being removed from the Technical Specifications.

LA03 **Unit 2 only:** *(Type 2 – Removing Descriptions of System Operation)* CTS Table 3.3-1 Footnote (f) states, "Each channel shall be comprised of two trip breakers; actual trip logic shall be one-out-of-two taken twice." ITS 3.3.2 does not include these system details. This changes the CTS by moving the system detail to the ITS Bases.

The removal of these details, that are related to system operation, from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement for the RTCBs to be OPERABLE and the relocated material describes aspects of the RTCB design. In addition, this change is acceptable, because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system operation is being removed from the Technical Specifications.

LA04 **Unit 2 only:** (*Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program*) CTS 3.3.1 Table 3.3-1 ACTION 2.a, states in part, "The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN." ITS 3.3.2 does not include these procedural details. This changes the CTS by moving the operational detail to procedures controlled under the PSL Quality Assurance Topical Report (QATR).

The removal of these details from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. OPERABILITY requirements following a unit shutdown are governed by the Technical Specifications MODE requirements, Technical Specification rules of usage (specifically LCO 3.0.4) and operating procedures when transitioning from Cold Shutdown (MODE 5). Also, this change is acceptable because the removed information will be adequately controlled by the requirements of 10 CFR 50, Appendix B, the PSL Quality Assurance Topical Report, and associated implementing procedures. Section XVI, "Corrective Action," of 10 CFR 50, Appendix B requires measures to be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. This regulatory requirement will ensure that the inoperable RPS Initiation Logic channels are restored to OPERABLE status promptly. Changes to the QATR implementing procedures are controlled under 10 CFR 50.54(a)(3) which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA05 **Unit 2 only:** (*Type 2 – Removing Descriptions of System Operation*) CTS 3.3.1 Table 3.3-1 Table 4.3-1 Note 7, states, "The fuse circuitry in the matrix fault protection circuitry shall be determined to be OPERABLE by testing with the installed test circuitry." ITS SR 3.3.2.2 requires a CHANNEL FUNCTIONAL TEST to be performed on each RPS Initiation logic channel but does not include these procedural/operational details. This changes the CTS by move the procedural detail to the ITS Bases.

The removal of these details, related to methods of surveillance test performance, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement to perform a CHANNEL FUNCTIONAL TEST. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specifications Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to methods of surveillance test performance is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 **Unit 1 only:** *(Category 4 – Relaxation of Required Action)* CTS Action 4, applicable to the Reactor Protective System Logic and Reactor Trip Breaker functions, states " With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in HOT STANDBY within 6 hours." ITS 3.3.2 ACTION B, applicable in MODES 1 and 2, requires the affected RTCBs to be opened in 1 hour, which can allow continued plant operation. This changes the CTS by requiring the affected RTCBs to be opened rather than requiring a shutdown to HOT STANDBY (MODE 3).

The purpose of ITS 3.3.2 ACTION B is to remove the need for the affected channel to automatically perform its function by manually performing the associated safety function. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. With the RTCB open, the affected Functions are in one-out-of-two logic, which meets the redundancy requirements without requiring shutdown. In this configuration, a single channel failure will not prevent a reactor trip. The Completion Time of 1 hour is adequate to open the affected RTCBs while the risk of having them closed for up to 1 hour is at an acceptable level. This change is designated as less restrictive because the unit shutdown requirement has been revised to allow for opening of the affected RTCBs. Therefore, less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 (*Category 7- Relaxation of Surveillance Frequency*) CTS Table 4.3-1 Functional Unit 12 (Unit 1 – Reactor Protection System Logic and Unit 2 – Reactor Trip Breakers), including Note 1, requires the performance of a CHANNEL

FUNCTIONAL TEST prior to each reactor startup if not performed in the previous 7 days. In addition, CTS Table 4.3-1 also requires the CHANNEL FUNCTIONAL TEST associated with Functional Unit 12 to be performed in accordance with the Surveillance Frequency Control Program (SFCP). ITS SR 3.3.2.2 continues to require the CHANNEL FUNCTIONAL TEST to be performed at a periodic frequency in accordance with the SFCP. However, the ITS does not require this "during startup if not performed in the previous 7 days" test. This changes the CTS by deleting the requirement to perform these startup CHANNEL FUNCTIONALTEST Surveillances.

The purpose of the CTS Table 4.3-1 Functional Unit 12 CHANNEL FUNCTIONAL TEST is to ensure the reactor trip breakers and reactor protection system logic are functioning properly. This change is acceptable because the normal periodic of the CHANNEL FUNCTIONAL TEST Surveillance Frequency in accordance with the SFCP is adequate to ensure these functions are OPERABLE. This change deletes the requirement to perform these startup Surveillances. ITS SR 3.0.4 (CTS 4.0.4) requires the normal periodic Surveillances to be performed and be current prior to entry into the applicable operational conditions. Once the applicable conditions are entered, the normal, periodic Surveillance Frequency provides adequate assurance of OPERABILITY. Therefore, the removal of this Frequency is considered acceptable. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~3~~ Reactor Protective System (RPS) Logic and Trip Initiation ~~(Analog)~~ 2

2

LCO 3.3.1.1 Table 3.3-1 Functions 1, 12 and 13 DOC M01 DOC A02	LCO 3.3.~~3~~	Six channels of RPS Matrix Logic, four channels of RPS Initiation Logic, ~~[~~four~~]~~ channels of reactor trip circuit breakers (RTCBs), and ~~[~~four~~]~~ channels of Manual Trip shall be OPERABLE. 2 3
Table 3.3-1 Footnote *, Function 1 DOC A03	APPLICABILITY:	MODES 1 and 2, MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M01 Action 1 DOC M01	A. One Matrix Logic channel inoperable. OR One Manual Trip channel inoperable in MODE 1 or 2 ~~OR~~ Three Matrix Logic channels inoperable due to a common power source failure de-energizing three matrix power supplies.	A.1 Restore channel(s) to OPERABLE status.	48 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	1 3
Action 4 DOC L01	B. One channel of ~~Manual Trip,~~ RTCBs, or Initiation Logic inoperable in MODE 1 or 2.	B.1 Open the affected RTCBs.	1 hour	1
Table 3.3-1 Functions 1, 12 and 13 DOC M03	C. One channel of Manual Trip, RTCBs, or Initiation Logic inoperable in MODE 3, 4, or 5.	C.1 Open the affected RTCBs.	48 hours	

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M03	D. Two channels of Manual Trip, RTCBs, or Initiation Logic affecting the same trip leg inoperable.	D.1 Open the affected RTCBs.	Immediately
Action 1 DOC M04 DOC M04	E. Required Action and associated Completion Time of Condition A, B, or D not met. OR One or more Functions with two or more Manual Trip, Matrix Logic, Initiation Logic, or RTCB channels inoperable for reasons other than Condition A or D.	E.1 Be in MODE 3. AND E.2 Open all RTCBs.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.3.1.1.1 Table 4.3-1 Function 13	SR 3.3.~~3~~ 2 .1	Perform a CHANNEL FUNCTIONAL TEST on each RTCB channel.	~~[[31] days~~ 2 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
4.3.1.1.1 Table 4.3-1 Function 12 DOC L02	SR 3.3.~~3~~.2	Perform a CHANNEL FUNCTIONAL TEST on each RPS Logic channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.1.1.1 Table 4.3-1 Function 1	SR 3.3.~~3~~.3	Perform a CHANNEL FUNCTIONAL TEST on each RPS Manual Trip channel.	Once within 7 days prior to each reactor startup
DOC M02	SR 3.3.~~3~~.4	~~[~~ Perform a CHANNEL FUNCTIONAL TEST, including separate verification of the undervoltage and shunt trips, on each RTCB channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~3~~ 2 Reactor Protective System (RPS) Logic and Trip Initiation ~~(Analog)~~

LCO 3.3.1 Table 3.3-1 Functions 1, 11 and 12 DOC M01

LCO 3.3.~~3~~ 2 Six channels of RPS Matrix Logic, four channels of RPS Initiation Logic, ~~[~~four~~]~~ channels of reactor trip circuit breakers (RTCBs), and ~~[~~four~~]~~ channels of Manual Trip shall be OPERABLE. 2 3

Applicability Table 3.3-1 Footnote *

APPLICABILITY: MODES 1 and 2,
MODES 3, 4, and 5, with any RTCBs closed and any control element assemblies capable of being withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M01 A. One Matrix Logic channel inoperable. Action 1 OR One Manual Trip channel inoperable in MODE 1 or 2 OR DOC M01 Three Matrix Logic channels inoperable due to a common power source failure de-energizing three matrix power supplies.	A.1 Restore channel(s) to OPERABLE status.	48 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~ 1 3
Table 3.3-1 Action 2 Action 4 DOC M06 B. One channel of ~~Manual Trip,~~ RTCBs, or Initiation Logic inoperable in MODE 1 or 2.	B.1 Open the affected RTCBs.	1 hour 1
Table 3.3-1 Functions 1, 11, and 12 Action 5 DOC M06 C. One channel of Manual Trip, RTCBs, or Initiation Logic inoperable in MODE 3, 4, or 5.	C.1 Open the affected RTCBs.	48 hours

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action 2.b. (Initiation Logic in Modes 1 & 2) DOC M03 DOC M05	D. Two channels of Manual Trip, RTCBs, or Initiation Logic affecting the same trip leg inoperable.	D.1 Open the affected RTCBs.	Immediately
Actions 1 and 4 DOC M04	E. Required Action and associated Completion Time of Condition A, B, or D not met. OR One or more Functions with two or more Manual Trip, Matrix Logic, Initiation Logic, or RTCB channels inoperable for reasons other than Condition A or D. (DOC M04)	E.1 Be in MODE 3. AND E.2 Open all RTCBs.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.3.1.1 Table 4.3-1 Function 12	SR 3.3.~~3~~.1 (2)	Perform a CHANNEL FUNCTIONAL TEST on each RTCB channel.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (2) (3)

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY
4.3.1.1 Table 4.3-1 Function 11	SR 3.3.~~3~~.2 (2)	Perform a CHANNEL FUNCTIONAL TEST on each RPS Logic channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ (2) (3)
4.3.1.1 Table 4.3-1 Function 1	SR 3.3.~~3~~.3 (2)	Perform a CHANNEL FUNCTIONAL TEST on each RPS Manual Trip channel.	Once within 7 days prior to each reactor startup (2)
Table 4.3-1 Function 12 Notation 6	SR 3.3.~~3~~.4 (2)	~~[~~ Perform a CHANNEL FUNCTIONAL TEST, including separate verification of the undervoltage and shunt trips, on each RTCB channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~ (2) (3)

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, REACTOR PROTECTION SYSTEM (RPS) LOGIC AND TRIP INITIATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.3 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The Reactor Protective System (RPS) Logic and Trip Initiation (ISTS 3.3.3) is renumbered as ITS 3.3.2.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~3~~ 2 Reactor Protective System (RPS) Logic and Trip Initiation ~~(Analog)~~ 2

BASES

BACKGROUND

The RPS initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and reactor coolant pressure boundary integrity during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents.

The protection and monitoring systems 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, defined in this Specification as the Allowable Value, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits during Design Basis Accidents.

During AOOs, which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System pressure SL of 2750 psia shall not be exceeded.

Maintaining the parameters within the above values ensures that the offsite dose will be within the ~~10 CFR 50 (Ref. 1) and~~ 10 CFR ~~100~~ 50.67 (Ref. ~~2~~ 1) criteria during AOOs. 1

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~2~~ 1) limits. Different accident categories allow a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event. 1

BASES

BACKGROUND (continued)

The RPS is segmented into four interconnected modules. These modules are:

- Measurement channels,
- Bistable trip units,
- RPS Logic, and
- Reactor trip circuit breakers (RTCBs).

This LCO addresses the RPS Logic and RTCBs, including Manual Trip capability. LCO 3.3.1, "Reactor Protective System (RPS) Instrumentation - Operating," provides a description of the role of this equipment in the RPS. This is summarized below:

RPS Logic

The RPS Logic, consisting of Matrix and Initiation Logic, employs a scheme that provides a reactor trip when bistables in any two of the four channels sense the same input parameter trip. This is called a two-out-of-four (one out of two taken twice) trip logic. ~~This logic and the RTCB configuration are shown in Figure B 3.3.1-1.~~ 1 5

Bistable relay contact outputs from the four channels are configured into six logic matrices. Each logic matrix checks for a coincident trip in the same parameter in two bistable channels. The matrices are designated the AB, AC, AD, BC, BD, and CD matrices to reflect the bistable channels being monitored. Each logic matrix contains four normally energized matrix relays. When a coincidence is detected, consisting of a trip in the same Function in the two channels being monitored by the logic matrix, all four matrix relays de-energize.

The matrix relay contacts are arranged into trip paths, with one of the four matrix relays in each matrix opening contacts in one of the four trip paths. Each trip path provides power to one of the four normally energized RTCB control relays (K1, K2, K3, and K4). The trip paths thus each have six contacts in series, one from each matrix, and perform a logical <u>OR</u> function, opening the RTCBs if any one or more of the six logic matrices indicate a coincidence condition.

BASES

BACKGROUND (continued)

Each trip path is responsible for opening one set of two of the eight RTCBs. The RTCB control relays (K-relays), when de-energized, interrupt power to the breaker undervoltage trip attachments and simultaneously apply power to the shunt trip attachments on each of the two breakers. Actuation of either the undervoltage or shunt trip attachment is sufficient to open the RTCB and interrupt power from the motor generator (MG) sets to the control element drive mechanisms (CEDMs).

When a coincidence occurs in two RPS channels, all four matrix relays in the affected matrix de-energize. This in turn de-energizes all four breaker control relays, which simultaneously de-energize the undervoltage and energize the shunt trip attachments in all eight RTCBs, tripping them open.

The Initiation Logic consists of the trip path power source, matrix relays and their associated contacts, all interconnecting wiring, and solid state (auxiliary) relays through the K-relay contacts in the RTCB control circuitry.

It is possible to change the two-out-of-four RPS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by trip channel bypassing select portions of the matrix logic. Trip channel bypassing a bistable effectively shorts the bistable relay contacts in the three matrices associated with that channel. Thus, the bistables will function normally, producing normal trip indication and annunciation, but a reactor trip will not occur unless two additional channels indicate a trip condition. Trip channel bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. An interlock prevents simultaneous trip channel bypassing of the same parameter in more than one channel. Trip channel bypassing is normally employed during maintenance or testing.

Reactor Trip Circuit Breakers (RTCBs)

The reactor trip switchgear~~, shown in Figure B 3.3.1-1,~~ consists of eight RTCBs, which are operated in four sets of two breakers (four channels). Power input to the reactor trip switchgear comes from two full capacity MG sets operated in parallel such that the loss of either MG set does not de-energize the CEDMs. There are two separate CEDM power supply 5

BASES

BACKGROUND (continued)

buses, each bus powering half of the CEDMs. Power is supplied from the MG sets to each bus via two redundant paths (trip legs). Trip legs 1A and 1B supply power to CEDM bus 1. Trip legs 2A and 2B supply power to CEDM bus 2. This ensures that a fault or the opening of a breaker in one trip leg (i.e., for testing purposes) will not interrupt power to the CEDM buses.

Each of the four trip legs consists of two RTCBs in series. The two RTCBs within a trip leg are actuated by separate initiation circuits.

The eight RTCBs are operated as four sets of two breakers (four channels). For example, if a breaker receives an open signal in trip leg A (for CEDM bus 1), an identical breaker in trip leg B (for CEDM bus 2) will also receive an open signal. This arrangement ensures that power is interrupted to both CEDM buses, thus preventing trip of only half of the control element assemblies (CEAs) (a half trip). Any one inoperable breaker in a channel will make the entire channel inoperable.

Each set of RTCBs is operated by either a Manual Trip push button or an RPS actuated K-relay. There are four Manual Trip push buttons, arranged in two sets of two~~, as shown in Figure B 3.3.1-1~~. Depressing both push buttons in either set will result in a reactor trip. 5

When a Manual Trip is initiated using the control room push buttons, the RPS trip paths and K-relays are bypassed, and the RTCB undervoltage and shunt trip attachments are actuated independent of the RPS.

Manual Trip circuitry includes the push button and interconnecting wiring to both RTCBs necessary to actuate both the undervoltage and shunt trip attachments, but excludes the K-relay contacts and their interconnecting wiring to the RTCBs, which are considered part of the Initiation Logic.

in accordance with the Surveillance Frequency Control Program 2

Functional testing of the entire RPS, from bistable input through the opening of individual sets of RTCBs, can be performed either at power or shutdown ~~and is normally performed on a quarterly basis~~. U FSAR, Section ~~[~~7.2~~]~~ (Ref. ~~3~~), explains RPS testing in more detail. 1 3

APPLICABLE SAFETY ANALYSES

Reactor Protective System (RPS) Logic

The RPS Logic provides for automatic trip initiation to maintain the SLs during AOOs and assist the ESF systems in ensuring acceptable consequences during accidents. All transients and accidents that call for a reactor trip assume the RPS Logic is functioning as designed.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Reactor Trip Circuit Breakers (RTCBs)

All of the transient and accident analyses that call for a reactor trip assume that the RTCBs operate and interrupt power to the CEDMs.

Manual Trip

There are no accident analyses that take credit for the Manual Trip; however, the Manual Trip is part of the RPS circuitry. It is used by the operator to shut down the reactor whenever any parameter is rapidly trending toward its trip setpoint. A Manual Trip accomplishes the same results as any one of the automatic trip Functions.

The RPS Logic and initiation satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Reactor Protective System (RPS) Logic

Failures of individual bistable relays and their contacts are addressed in LCO 3.3.1. This Specification addresses failures of the Matrix Logic not addressed in the above, such as the failure of matrix relay power supplies or the failure of the trip channel bypass contact in the bypass condition.

Loss of a single ~~vital~~ instrument bus will de-energize one of the two power supplies in each of three matrices. This will result in four RTCBs opening; however, the remaining four closed RTCBs will prevent a reactor trip. For the purposes of this LCO, de-energizing up to three matrix power supplies due to a single failure is to be treated as a single channel failure, providing the affected matrix relays de-energize as designed, opening the affected RTCBs.

Each of the four Initiation Logic channels opens one set of RTCBs if any of the six coincidence matrices de-energize their associated matrix relays. They thus perform a logical OR function. Each Initiation Logic channel has its own power supply and is independent of the others. An Initiation Logic channel includes the matrix relay through to the K-relay contacts, which open the RTCB.

It is possible for two Initiation Logic channels affecting the same trip leg to de-energize if a matrix power supply or ~~vital~~ instrument bus fails. This will result in opening the two affected sets of RTCBs.

BASES

LCO (continued)

If one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection if a trip should be required. It is unlikely that a trip will be required during the Surveillance, coincident with a failure of the remaining series RTCB channel. If a single matrix power supply or ~~vital~~ instrument bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip. 1

1. Matrix Logic

   This LCO requires six channels of Matrix Logic to be OPERABLE in MODES 1 and 2, and in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

2. Initiation Logic

   This LCO requires four channels of Initiation Logic to be OPERABLE in MODES 1 and 2, and in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

3. Reactor Trip Circuit Breakers (RTCBs)

   The LCO requires four RTCB channels to be OPERABLE in MODES 1 and 2, as well as in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

   Each channel consists of two breakers operated in a single set by the Initiation Logic or Manual Trip circuitry. This ensures that power is interrupted at identical locations in the trip legs for both CEDM buses, thus preventing power removal to only one CEDM bus (a half trip).

   Failure of a single breaker affects the entire channel, and both breakers in the set must be opened. Without reliable RTCBs and associated support circuitry, a reactor trip cannot occur whether initiated automatically or manually.

   Each channel of RTCBs starts at the contacts actuated by the K-relay, and the contacts actuated by the Manual Trip, for each set of breakers. The K-relay actuated contacts and the upstream circuitry are considered to be RPS Logic. Manual Trip contacts and upstream circuitry are considered to be Manual Trip circuitry.

BASES

LCO (continued)

I ~~A Note associated with the ACTIONS states that i~~f one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection. If a single matrix power supply or vital bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip. ~~This Note is not applicable to Condition A, with one Matrix Logic channel inoperable.~~ 1

4. Manual Trip

The LCO requires all four Manual Trip channels to be OPERABLE in MODES 1 and 2, and MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

Two independent sets of two adjacent push buttons are provided at separate locations. Each push button is considered a channel and operates two of the eight RTCBs. Depressing both push buttons in either set will cause an interruption of power to the CEDMs, allowing the CEAs to fall into the core. This design ensures that no single failure in any push button circuit can either cause or prevent a reactor trip.

APPLICABILITY

The RPS Matrix Logic, RTCBs, and Manual Trip are required to be OPERABLE in any MODE when any CEA is capable of being withdrawn from the core (i.e., RTCBs closed and power available to the CEDMs). This ensures the reactor can be tripped when necessary, but allows for maintenance and testing when the reactor trip is not needed.

In MODES 3, 4, and 5 with all the RTCBs open, the CEAs are not capable of withdrawal and these Functions do not have to be OPERABLE. However, two ~~[~~logarithmic~~]~~ ~~power~~ neutron flux level channels must be OPERABLE to ensure proper indication of neutron population and to indicate a boron dilution event. This is addressed in LCO 3.3.~~13~~11, "~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring Channels." 1 3 1

ACTIONS

When the number of inoperable channels in a trip Function exceeds that specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

BASES

ACTIONS (continued)

A.1

, one Manual Trip channel is inoperable, 1

Condition A applies if one Matrix Logic channel is inoperable or three Matrix Logic channels are inoperable due to a common power source failure de-energizing three matrix power supplies, in any applicable MODE. Loss of a single ~~vital~~ instrument bus will de-energize one of the two matrix power supplies in up to three matrices. This is considered a single matrix failure, providing the matrix relays associated with the failed power supplies de-energize as required. 1

Failure of the matrix relays to de-energize in all three affected matrices could, when combined with trip channel bypassing of bistable relay contacts in the other matrices, result in loss of RPS function.

The channel must be restored to OPERABLE status within 48 hours ~~[~~or in accordance with the Risk Informed Completion Time Program~~]~~. The Completion Time of 48 hours provides the operator time to take appropriate actions and still ensures that any risk involved in operating with a failed channel is acceptable. Operating experience has demonstrated that the probability of a random failure of a second Matrix Logic channel is low during any given 48 hour interval. If the channel cannot be restored to OPERABLE status within 48 hours, Condition E is entered. 3

B.1

or

Condition B applies to one Initiation Logic channel, RTCB channel~~, or Manual Trip channel~~ in MODES 1 and 2, since they have the same actions. MODES 3, 4, and 5, with the RTCBs shut, are addressed in Condition C. These Required Actions require opening the affected RTCBs. This removes the need for the affected channel by performing its associated safety function. With the RTCB open, the affected Functions are in one-out-of-two logic, which meets redundancy requirements, but testing on the OPERABLE channels cannot be performed without causing a reactor trip unless the RTCBs in the inoperable channels are closed to permit testing. 1

The inoperable channel may be bypassed during the one hour period to perform testing, if necessary, provided the RTCBs are opened within the required Completion Time. 1

Required Action B.1 provides for opening the RTCBs associated with the inoperable channel within a Completion Time of 1 hour. This Required Action is conservative, since depressing the Manual Trip push button associated with either set of breakers in the other trip leg will cause a reactor trip. With this configuration, a single channel failure will not prevent a reactor trip. The allotted Completion Time is adequate to open the affected RTCBs while maintaining the risk of having them closed at an acceptable level.

BASES

ACTIONS (continued)

C.1

Condition C applies to the failure of one Initiation Logic channel, RTCB channel, or Manual Trip channel ~~affecting the same trip leg~~ in MODE 3, 4, or 5 with the RTCBs closed. The channel must be restored to OPERABLE status within 48 hours. If the inoperable channel cannot be restored to OPERABLE status within 48 hours, the affected RTCBs must be opened. ~~In some cases, this condition may effect all of the RTCBs.~~ This removes the need for the affected channel by performing its associated safety function. With the RTCBs open, the affected functions are in a one-out-of-two logic, which meets redundancy requirements. 1

The Completion Time of 48 hours is consistent with that of other RPS instrumentation and should be adequate to repair most failures.

Testing on the OPERABLE channels cannot be performed without causing a reactor trip unless the RTCBs in the inoperable channels are closed to permit testing.

D.1

Condition D applies to the failure of both Manual Trip or Initiation Logic channels affecting the same trip leg. Since this will open two channels of RTCBs, this Condition is also applicable to the two affected channels of RTCBs. This Condition allows for loss of a single ~~vital~~ instrument bus or matrix power supply, which will de-energize both Initiation Logic channels in the same trip leg. This will open both sets of RTCBs in the affected trip leg, satisfying the Required Action of opening the affected RTCBs. 1

Of greater concern is the failure of the initiation circuit in a nontrip condition (e.g., due to two initiation K-relay failures). With only one Initiation Logic channel failed in a nontrip condition, there is still the redundant set of RTCBs in the trip leg. With both failed in a nontrip condition, the reactor will not trip automatically when required. In either case, the affected RTCBs must be opened immediately by using the appropriate Manual Trip push buttons, since each of the four push buttons opens one set of RTCBs, independent of the initiation circuitry. Caution must be exercised, since depressing the wrong push buttons may result in a reactor trip.

BASES

ACTIONS (continued)

If two Manual Trip channels are inoperable and affecting the same trip leg, the associated RTCBs must be opened immediately to ensure Manual Trip capability is maintained. With the affected RTCBs open, any one of two Manual Trip push buttons being depressed will result in a reactor trip.

If the affected RTCB(s) cannot be opened, Condition E is entered. This would only occur if there is a failure in the Manual Trip circuitry or the RTCB(s).

E.1 and E.2

Condition E is entered if Required Actions associated with Condition A, B, or D are not met within the required Completion Time or if for one or more Functions more than one Manual Trip, Matrix Logic, Initiation Logic, or RTCB channel is inoperable for reasons other than Condition A or D.

If the RTCBs associated with the inoperable channel cannot be opened, the reactor must be shut down within 6 hours and all the RTCBs opened. A Completion Time of 6 hours is reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems and to open RTCBs. All RTCBs should then be opened, placing the plant in a MODE where the LCO does not apply and ensuring no CEA withdrawal occurs.

SURVEILLANCE REQUIREMENTS

~~REVIEWER'S NOTE~~
~~In order for a plant to take credit for topical reports as the basis for justifying Frequencies, topical reports must be supported by an NRC staff Safety Evaluation Report that establishes the acceptability of each topical report for that unit (Ref. 4).~~ 4

SR 3.3.~~3~~ 2 .1 2

A CHANNEL FUNCTIONAL TEST is performed on each RTCB channel. This verifies proper operation of each RTCB. The RTCB must then be closed prior to testing the other RTCBs, or a reactor trip may result~~. [The Frequency of 31 days is based on the reliability analysis presented in Topical Report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," (Ref. 5).~~ 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 4

2

SR 3.3.~~3~~.2 2

A CHANNEL FUNCTIONAL TEST on each RPS Logic channel is performed to ensure the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

In addition to power supply tests, the RPS CHANNEL FUNCTIONAL TEST consists of three overlapping tests as described in Reference ~~3~~. 2 1 These tests verify that the RPS is capable of performing its intended function, from bistable input through the RTCBs. The first test, the bistable test, is addressed by SR 3.3.1.4 in LCO 3.3.1.

This SR addresses the two tests associated with the RPS Logic: Matrix Logic and Trip Path.

Matrix Logic Tests

These tests are performed one matrix at a time. They verify that a coincidence in the two input channels for each Function removes power from the matrix relays. During testing, power is applied to the matrix relay test coils and prevents the matrix relay contacts from assuming their de-energized state. The Matrix Logic tests will detect any short circuits around the bistable contacts in the coincidence logic such as may be caused by faulty bistable relay or trip channel bypass contacts.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trip Path Tests

These tests are similar to the Matrix Logic tests, except that test power is withheld from one matrix relay at a time, allowing the initiation circuit to de-energize, opening the affected set of RTCBs. The RTCBs must then be closed prior to testing the other three initiation circuits, or a reactor trip may result.

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 5).~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-----]~~ 3

SR 3.3.~~3~~ 2 .3 2

A CHANNEL FUNCTIONAL TEST on the Manual Trip channels is performed prior to a reactor startup to ensure the entire channel will perform its intended function if required. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Manual Trip Function can be tested either at power or shutdown. However, the simplicity of this circuitry and the absence of drift concern makes this Frequency adequate. Additionally, operating experience has shown that these components usually pass the Surveillance when performed once within 7 days prior to each reactor startup.

BASES

SURVEILLANCE REQUIREMENTS (continued)

2
~~[~~ SR 3.3.~~3~~.4 2 3

Each RTCB is actuated by an undervoltage coil and a shunt trip coil. The system is designed so that either de-energizing the undervoltage coil or energizing the shunt trip coil will cause the circuit breaker to open. When an RTCB is opened, either during an automatic reactor trip or by using the manual push buttons in the control room, the undervoltage coil is de-energized and the shunt trip coil is energized. This makes it impossible to determine if one of the coils or associated circuitry is defective.

Therefore, a CHANNEL FUNCTIONAL TEST is performed that individually tests all four sets of undervoltage coils and all four sets of shunt trip coils. During undervoltage coil testing, the shunt trip coils shall remain de-energized, preventing their operation. Conversely, during shunt trip coil testing, the undervoltage coils shall remain energized, preventing their operation. This Surveillance ensures that every undervoltage coil and every shunt trip coil is capable of performing its intended function and that no single active failure of any RTCB component will prevent a reactor trip. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. ~~[The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the Frequency of once every 18 months.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

If one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection if a trip should be required. It is unlikely that a trip will be required during the Surveillance, coincident with a failure of the remaining series RTCB channel. If a single matrix power supply or vital bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip. ~~]~~

REFERENCES

~~1. 10 CFR 50, Appendix A.~~

1 ~~2~~. 10 CFR ~~100~~ 50.67.

2 ~~3~~. U FSAR, Section ~~[~~7.2~~]~~.

~~4. NRC Safety Evaluation Report, [Date].~~

~~5. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~3~~ 2 Reactor Protective System (RPS) Logic and Trip Initiation ~~(Analog)~~ 2

BASES

BACKGROUND

The RPS initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and reactor coolant pressure boundary integrity during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents.

The protection and monitoring systems 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, defined in this Specification as the Allowable Value, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits during Design Basis Accidents.

During AOOs, which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System pressure SL of 2750 psia shall not be exceeded.

Maintaining the parameters within the above values ensures that the offsite dose will be within the ~~10 CFR 50 (Ref. 1) and~~ 10 CFR ~~100~~ 50.67 (Ref. ~~2~~ 1) criteria during AOOs. 1

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~2~~ 1) limits. Different accident categories allow a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event. 1

BASES

BACKGROUND (continued)

The RPS is segmented into four interconnected modules. These modules are:

- Measurement channels,
- Bistable trip units,
- RPS Logic, and
- Reactor trip circuit breakers (RTCBs).

This LCO addresses the RPS Logic and RTCBs, including Manual Trip capability. LCO 3.3.1, "Reactor Protective System (RPS) Instrumentation - Operating," provides a description of the role of this equipment in the RPS. This is summarized below:

RPS Logic

The RPS Logic, consisting of Matrix and Initiation Logic, employs a scheme that provides a reactor trip when bistables in any two of the four channels sense the same input parameter trip. This is called a two-out-of-four (one out of two taken twice) trip logic. ~~This logic and the RTCB configuration are shown in Figure B 3.3.1-1.~~ 1 5

Bistable relay contact outputs from the four channels are configured into six logic matrices. Each logic matrix checks for a coincident trip in the same parameter in two bistable channels. The matrices are designated the AB, AC, AD, BC, BD, and CD matrices to reflect the bistable channels being monitored. Each logic matrix contains four normally energized matrix relays. When a coincidence is detected, consisting of a trip in the same Function in the two channels being monitored by the logic matrix, all four matrix relays de-energize.

The matrix relay contacts are arranged into trip paths, with one of the four matrix relays in each matrix opening contacts in one of the four trip paths. Each trip path provides power to one of the four normally energized RTCB control relays (K1, K2, K3, and K4). The trip paths thus each have six contacts in series, one from each matrix, and perform a logical OR function, opening the RTCBs if any one or more of the six logic matrices indicate a coincidence condition.

BASES

BACKGROUND (continued)

Each trip path is responsible for opening one set of two of the eight RTCBs. The RTCB control relays (K-relays), when de-energized, interrupt power to the breaker undervoltage trip attachments and simultaneously apply power to the shunt trip attachments on each of the two breakers. Actuation of either the undervoltage or shunt trip attachment is sufficient to open the RTCB and interrupt power from the motor generator (MG) sets to the control element drive mechanisms (CEDMs).

When a coincidence occurs in two RPS channels, all four matrix relays in the affected matrix de-energize. This in turn de-energizes all four breaker control relays, which simultaneously de-energize the undervoltage and energize the shunt trip attachments in all eight RTCBs, tripping them open.

The Initiation Logic consists of the trip path power source, matrix relays and their associated contacts, all interconnecting wiring, and solid state (auxiliary) relays through the K-relay contacts in the RTCB control circuitry.

It is possible to change the two-out-of-four RPS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by trip channel bypassing select portions of the matrix logic. Trip channel bypassing a bistable effectively shorts the bistable relay contacts in the three matrices associated with that channel. Thus, the bistables will function normally, producing normal trip indication and annunciation, but a reactor trip will not occur unless two additional channels indicate a trip condition. Trip channel bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. An interlock prevents simultaneous trip channel bypassing of the same parameter in more than one channel. Trip channel bypassing is normally employed during maintenance or testing.

<u>Reactor Trip Circuit Breakers (RTCBs)</u>

The reactor trip switchgear~~, shown in Figure B 3.3.1-1,~~ consists of eight RTCBs, which are operated in four sets of two breakers (four channels). Power input to the reactor trip switchgear comes from two full capacity MG sets operated in parallel such that the loss of either MG set does not de-energize the CEDMs. There are two separate CEDM power supply 5

BASES

BACKGROUND (continued)

buses, each bus powering half of the CEDMs. Power is supplied from the MG sets to each bus via two redundant paths (trip legs). Trip legs 1A and 1B supply power to CEDM bus 1. Trip legs 2A and 2B supply power to CEDM bus 2. This ensures that a fault or the opening of a breaker in one trip leg (i.e., for testing purposes) will not interrupt power to the CEDM buses.

Each of the four trip legs consists of two RTCBs in series. The two RTCBs within a trip leg are actuated by separate initiation circuits.

The eight RTCBs are operated as four sets of two breakers (four channels). For example, if a breaker receives an open signal in trip leg A (for CEDM bus 1), an identical breaker in trip leg B (for CEDM bus 2) will also receive an open signal. This arrangement ensures that power is interrupted to both CEDM buses, thus preventing trip of only half of the control element assemblies (CEAs) (a half trip). Any one inoperable breaker in a channel will make the entire channel inoperable.

Each set of RTCBs is operated by either a Manual Trip push button or an RPS actuated K-relay. There are four Manual Trip push buttons, arranged in two sets of two~~, as shown in Figure B 3.3.1-1~~. Depressing both push buttons in either set will result in a reactor trip. 5

When a Manual Trip is initiated using the control room push buttons, the RPS trip paths and K-relays are bypassed, and the RTCB undervoltage and shunt trip attachments are actuated independent of the RPS.

Manual Trip circuitry includes the push button and interconnecting wiring to both RTCBs necessary to actuate both the undervoltage and shunt trip attachments, but excludes the K-relay contacts and their interconnecting wiring to the RTCBs, which are considered part of the Initiation Logic.

in accordance with the Surveillance Frequency Control Program 2

Functional testing of the entire RPS, from bistable input through the opening of individual sets of RTCBs, can be performed either at power or shutdown ~~and is normally performed on a quarterly basis~~. U FSAR, Section ~~[~~7.2~~]~~ (Ref. ~~3~~), explains RPS testing in more detail. 1 3

APPLICABLE SAFETY ANALYSES

Reactor Protective System (RPS) Logic

The RPS Logic provides for automatic trip initiation to maintain the SLs during AOOs and assist the ESF systems in ensuring acceptable consequences during accidents. All transients and accidents that call for a reactor trip assume the RPS Logic is functioning as designed.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Reactor Trip Circuit Breakers (RTCBs)

All of the transient and accident analyses that call for a reactor trip assume that the RTCBs operate and interrupt power to the CEDMs.

Manual Trip

There are no accident analyses that take credit for the Manual Trip; however, the Manual Trip is part of the RPS circuitry. It is used by the operator to shut down the reactor whenever any parameter is rapidly trending toward its trip setpoint. A Manual Trip accomplishes the same results as any one of the automatic trip Functions.

The RPS Logic and initiation satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Reactor Protective System (RPS) Logic

Failures of individual bistable relays and their contacts are addressed in LCO 3.3.1. This Specification addresses failures of the Matrix Logic not addressed in the above, such as the failure of matrix relay power supplies or the failure of the trip channel bypass contact in the bypass condition.

instrument

Loss of a single ~~vital~~ bus will de-energize one of the two power supplies in each of three matrices. This will result in four RTCBs opening; however, the remaining four closed RTCBs will prevent a reactor trip. For the purposes of this LCO, de-energizing up to three matrix power supplies due to a single failure is to be treated as a single channel failure, providing the affected matrix relays de-energize as designed, opening the affected RTCBs. 1

Each of the four Initiation Logic channels opens one set of RTCBs if any of the six coincidence matrices de-energize their associated matrix relays. They thus perform a logical OR function. Each Initiation Logic channel has its own power supply and is independent of the others. An Initiation Logic channel includes the matrix relay through to the K-relay contacts, which open the RTCB.

It is possible for two Initiation Logic channels affecting the same trip leg to de-energize if a matrix power supply or ~~vital~~ instrument bus fails. This will result in opening the two affected sets of RTCBs. 1

BASES

LCO (continued)

If one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection if a trip should be required. It is unlikely that a trip will be required during the Surveillance, coincident with a failure of the remaining series RTCB channel. If a single matrix power supply or ~~vital~~ instrument bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip.

1. Matrix Logic

   This LCO requires six channels of Matrix Logic to be OPERABLE in MODES 1 and 2, and in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

2. Initiation Logic

   This LCO requires four channels of Initiation Logic to be OPERABLE in MODES 1 and 2, and in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

3. Reactor Trip Circuit Breakers (RTCBs)

   The LCO requires four RTCB channels to be OPERABLE in MODES 1 and 2, as well as in MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

   Each channel consists of two breakers operated in a single set by the Initiation Logic or Manual Trip circuitry. This ensures that power is interrupted at identical locations in the trip legs for both CEDM buses, thus preventing power removal to only one CEDM bus (a half trip).

   Failure of a single breaker affects the entire channel, and both breakers in the set must be opened. Without reliable RTCBs and associated support circuitry, a reactor trip cannot occur whether initiated automatically or manually.

   Each channel of RTCBs starts at the contacts actuated by the K-relay, and the contacts actuated by the Manual Trip, for each set of breakers. The K-relay actuated contacts and the upstream circuitry are considered to be RPS Logic. Manual Trip contacts and upstream circuitry are considered to be Manual Trip circuitry.

BASES

LCO (continued)

~~A Note associated with the ACTIONS states that i~~ I f one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection. If a single matrix power supply or vital bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip. ~~This Note is not applicable to Condition A, with one Matrix Logic channel inoperable.~~ 1 1

4. Manual Trip

The LCO requires all four Manual Trip channels to be OPERABLE in MODES 1 and 2, and MODES 3, 4, and 5 when any RTCB is closed and any CEA is capable of being withdrawn.

Two independent sets of two adjacent push buttons are provided at separate locations. Each push button is considered a channel and operates two of the eight RTCBs. Depressing both push buttons in either set will cause an interruption of power to the CEDMs, allowing the CEAs to fall into the core. This design ensures that no single failure in any push button circuit can either cause or prevent a reactor trip.

APPLICABILITY

The RPS Matrix Logic, RTCBs, and Manual Trip are required to be OPERABLE in any MODE when any CEA is capable of being withdrawn from the core (i.e., RTCBs closed and power available to the CEDMs). This ensures the reactor can be tripped when necessary, but allows for maintenance and testing when the reactor trip is not needed.

In MODES 3, 4, and 5 with all the RTCBs open, the CEAs are not capable of withdrawal and these Functions do not have to be OPERABLE. However, two ~~[~~logarithmic~~]~~ ~~power~~ neutron flux level channels must be OPERABLE to ensure proper indication of neutron population and to indicate a boron dilution event. This is addressed in LCO 3.3.~~13~~ 11, "~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring Channels." 1 3 1

ACTIONS

When the number of inoperable channels in a trip Function exceeds that specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.

BASES

ACTIONS (continued)

A.1

, one Manual Trip channel is inoperable,

Condition A applies if one Matrix Logic channel is inoperable or three Matrix Logic channels are inoperable due to a common power source failure de-energizing three matrix power supplies, in any applicable MODE. Loss of a single ~~vital~~ instrument bus will de-energize one of the two matrix power supplies in up to three matrices. This is considered a single matrix failure, providing the matrix relays associated with the failed power supplies de-energize as required. 1 1

Failure of the matrix relays to de-energize in all three affected matrices could, when combined with trip channel bypassing of bistable relay contacts in the other matrices, result in loss of RPS function.

The channel must be restored to OPERABLE status within 48 hours ~~[~~or in accordance with the Risk Informed Completion Time Program~~]~~. The Completion Time of 48 hours provides the operator time to take appropriate actions and still ensures that any risk involved in operating with a failed channel is acceptable. Operating experience has demonstrated that the probability of a random failure of a second Matrix Logic channel is low during any given 48 hour interval. If the channel cannot be restored to OPERABLE status within 48 hours, Condition E is entered. 3

B.1

or

Condition B applies to one Initiation Logic channel, RTCB channel~~, or Manual Trip channel~~ in MODES 1 and 2, since they have the same actions. MODES 3, 4, and 5, with the RTCBs shut, are addressed in Condition C. These Required Actions require opening the affected RTCBs. This removes the need for the affected channel by performing its associated safety function. With the RTCB open, the affected Functions are in one-out-of-two logic, which meets redundancy requirements, but testing on the OPERABLE channels cannot be performed without causing a reactor trip unless the RTCBs in the inoperable channels are closed to permit testing. 1 1

The inoperable channel may be bypassed during the one hour period to perform testing, if necessary, provided the RTCBs are opened within the required Completion Time.

Required Action B.1 provides for opening the RTCBs associated with the inoperable channel within a Completion Time of 1 hour. This Required Action is conservative, since depressing the Manual Trip push button associated with either set of breakers in the other trip leg will cause a reactor trip. With this configuration, a single channel failure will not prevent a reactor trip. The allotted Completion Time is adequate to open the affected RTCBs while maintaining the risk of having them closed at an acceptable level.

BASES

ACTIONS (continued)

C.1

Condition C applies to the failure of one Initiation Logic channel, RTCB channel, or Manual Trip channel ~~affecting the same trip leg~~ in MODE 3, 4, or 5 with the RTCBs closed. The channel must be restored to OPERABLE status within 48 hours. If the inoperable channel cannot be restored to OPERABLE status within 48 hours, the affected RTCBs must be opened. ~~In some cases, this condition may effect all of the RTCBs.~~ This removes the need for the affected channel by performing its associated safety function. With the RTCBs open, the affected functions are in a one-out-of-two logic, which meets redundancy requirements. 1

The Completion Time of 48 hours is consistent with that of other RPS instrumentation and should be adequate to repair most failures.

Testing on the OPERABLE channels cannot be performed without causing a reactor trip unless the RTCBs in the inoperable channels are closed to permit testing.

D.1

Condition D applies to the failure of both Manual Trip or Initiation Logic channels affecting the same trip leg. Since this will open two channels of RTCBs, this Condition is also applicable to the two affected channels of RTCBs. This Condition allows for loss of a single ~~vital~~ instrument bus or matrix power supply, which will de-energize both Initiation Logic channels in the same trip leg. This will open both sets of RTCBs in the affected trip leg, satisfying the Required Action of opening the affected RTCBs. 1

Of greater concern is the failure of the initiation circuit in a nontrip condition (e.g., due to two initiation K-relay failures). With only one Initiation Logic channel failed in a nontrip condition, there is still the redundant set of RTCBs in the trip leg. With both failed in a nontrip condition, the reactor will not trip automatically when required. In either case, the affected RTCBs must be opened immediately by using the appropriate Manual Trip push buttons, since each of the four push buttons opens one set of RTCBs, independent of the initiation circuitry. Caution must be exercised, since depressing the wrong push buttons may result in a reactor trip.

BASES

ACTIONS (continued)

If two Manual Trip channels are inoperable and affecting the same trip leg, the associated RTCBs must be opened immediately to ensure Manual Trip capability is maintained. With the affected RTCBs open, any one of two Manual Trip push buttons being depressed will result in a reactor trip.

If the affected RTCB(s) cannot be opened, Condition E is entered. This would only occur if there is a failure in the Manual Trip circuitry or the RTCB(s).

E.1 and E.2

Condition E is entered if Required Actions associated with Condition A, B, or D are not met within the required Completion Time or if for one or more Functions more than one Manual Trip, Matrix Logic, Initiation Logic, or RTCB channel is inoperable for reasons other than Condition A or D.

If the RTCBs associated with the inoperable channel cannot be opened, the reactor must be shut down within 6 hours and all the RTCBs opened. A Completion Time of 6 hours is reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems and to open RTCBs. All RTCBs should then be opened, placing the plant in a MODE where the LCO does not apply and ensuring no CEA withdrawal occurs.

SURVEILLANCE REQUIREMENTS

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~In order for a plant to take credit for topical reports as the basis for justifying Frequencies, topical reports must be supported by an NRC staff Safety Evaluation Report that establishes the acceptability of each topical report for that unit (Ref. 4).~~
~~--~~ 4

2
SR 3.3.~~3~~.1 2

A CHANNEL FUNCTIONAL TEST is performed on each RTCB channel. This verifies proper operation of each RTCB. The RTCB must then be closed prior to testing the other RTCBs, or a reactor trip may result~~. [The Frequency of 31 days is based on the reliability analysis presented in Topical Report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," (Ref. 5).~~ 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ 4

2

SR 3.3.~~3~~.2 2

A CHANNEL FUNCTIONAL TEST on each RPS Logic channel is performed to ensure the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

In addition to power supply tests, the RPS CHANNEL FUNCTIONAL TEST consists of three overlapping tests as described in Reference ~~3~~ 2. 1
These tests verify that the RPS is capable of performing its intended function, from bistable input through the RTCBs. The first test, the bistable test, is addressed by SR 3.3.1.4 in LCO 3.3.1.

This SR addresses the two tests associated with the RPS Logic: Matrix Logic and Trip Path.

Matrix Logic Tests

These tests are performed one matrix at a time. They verify that a coincidence in the two input channels for each Function removes power from the matrix relays. During testing, power is applied to the matrix relay test coils and prevents the matrix relay contacts from assuming their de-energized state. The Matrix Logic tests will detect any short circuits around the bistable contacts in the coincidence logic such as may be caused by faulty bistable relay or trip channel bypass contacts.

The matrix logic includes fuses in all matrix interbay connections as part of the fault protection circuitry. A test circuit is provided for checking the fuses associated with the matrix fault protection circuitry. 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

Trip Path Tests

These tests are similar to the Matrix Logic tests, except that test power is withheld from one matrix relay at a time, allowing the initiation circuit to de-energize, opening the affected set of RTCBs. The RTCBs must then be closed prior to testing the other three initiation circuits, or a reactor trip may result.

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 5).~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

2
SR 3.3.~~3~~.3 2

A CHANNEL FUNCTIONAL TEST on the Manual Trip channels is performed prior to a reactor startup to ensure the entire channel will perform its intended function if required. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Manual Trip Function can be tested either at power or shutdown. However, the simplicity of this circuitry and the absence of drift concern makes this Frequency adequate. Additionally, operating experience has shown that these components usually pass the Surveillance when performed once within 7 days prior to each reactor startup.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[~~SR 3.3.~~3~~.4

Each RTCB is actuated by an undervoltage coil and a shunt trip coil. The system is designed so that either de-energizing the undervoltage coil or energizing the shunt trip coil will cause the circuit breaker to open. When an RTCB is opened, either during an automatic reactor trip or by using the manual push buttons in the control room, the undervoltage coil is de-energized and the shunt trip coil is energized. This makes it impossible to determine if one of the coils or associated circuitry is defective.

Therefore, a CHANNEL FUNCTIONAL TEST is performed that individually tests all four sets of undervoltage coils and all four sets of shunt trip coils. During undervoltage coil testing, the shunt trip coils shall remain de-energized, preventing their operation. Conversely, during shunt trip coil testing, the undervoltage coils shall remain energized, preventing their operation. This Surveillance ensures that every undervoltage coil and every shunt trip coil is capable of performing its intended function and that no single active failure of any RTCB component will prevent a reactor trip. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. ~~[The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the Frequency of once every 18 months.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

If one set of RTCBs has been opened in response to a single RTCB channel, Initiation Logic channel, or Manual Trip channel failure, the affected set of RTCBs may be closed for up to 1 hour for Surveillance on the OPERABLE Initiation Logic, RTCB, and Manual Trip channels. In this case, the redundant set of RTCBs will provide protection if a trip should be required. It is unlikely that a trip will be required during the Surveillance, coincident with a failure of the remaining series RTCB channel. If a single matrix power supply or vital bus failure has opened two sets of RTCBs, Manual Trip and RTCB testing on the closed breakers cannot be performed without causing a trip. ~~]~~ 3

REFERENCES

~~1. 10 CFR 50, Appendix A.~~

1 ~~2~~. 10 CFR ~~100~~ 50.67.

2 ~~3~~. U FSAR, Section ~~[~~7.2~~]~~.

~~4. NRC Safety Evaluation Report, [Date].~~

~~5. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

1 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2 BASES, REACTOR PROTECTION SYSTEM (RPS) LOGIC AND TRIP INITIATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.3 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The Reactor Protective System (RPS) Logic and Trip Initiation (ISTS 3.3.3) is renumbered as ITS 3.3.2.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Figure B 3.3.1-1 was removed from the ITS 3.3.1-1 Bases because the figure is included in the UFSAR.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.2, REACTOR PROTECTION SYSTEM (RPS) LOGIC AND TRIP INITIATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 3

3.3.3, ESFAS Instrumentation

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.3
Table 3.3.3-1

~~3.3.2.1~~ The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4~~. LA01

LCO 3.3.3
Table 3.3.3-1

APPLICABILITY: As shown in Table 3.3-3.

Add proposed ITS 3.3.3 ACTIONS Note A02

ACTION:

Table 3.3.3-1

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTIONS for associated
* Table 3.3.3-1 Functions 1-6

Table 3.3.3-1
Note (b)

ACTIONS for associated
* Table 3.3.3-1 Functions 1-6

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1, SR 3.3.3.4,
SR 3.3.3.2
Table 3.3.3-1

~~4.3.2.1.1~~ Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes ~~and at the frequencies~~ shown in Table 4.3-2.

In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1
SR 3.3.3.3

SR 3.3.3.4

~~4.3.2.1.2~~ The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. ~~The total bypass function shall be demonstrated OPERABLE~~ in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing ~~of each channel affected by bypass operation~~. A03

include the bypass removal functions

Table 3.3.3-1
SR 3.3.3.5

~~4.3.2.1.3~~ The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. ~~Each test shall include at least one channel per function.~~ A03

ACTIONS for associated
*Table 3.3.3-1 Functions 1-6
ACTION A,E,I – CSAS
ACTION B,F,I – RAS
ACTION C,E,I – AFAS
ACTION C,E,I – AUX FW ISOL
ACTION D,F,I – SIAS, CIAS, MSIS
ACTION G,H,I – BYPASSES

A01

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA02

A04

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	1. SAFETY INJECTION (SIAS)						
	a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8	See ITS 3.3.4
Table 3.3.3-1 1.a	b. Containment Pressure – High	4	~~2~~	~~3~~ 4	1, 2, 3	9	A04
Table 3.3.3-1 1.b	c. Pressurizer Pressure – Low	4	~~2~~	~~3~~ 4	1, 2, 3(a)	9	A04
	2. CONTAINMENT SPRAY (CSAS)						
	a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8	See ITS 3.3.4
Table 3.3.3-1 2.a; Table 3.3.3-1 Note (d)	b. Containment Pressure – High-High	4	~~2~~(b)	~~3~~ 4	1, 2, 3	10A, 10B	A04
	3. CONTAINMENT ISOLATION (CIS)						
	a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	8	See ITS 3.3.4
Table 3.3.3-1 3.a	b. Containment Pressure – High	4	~~2~~	~~3~~ 4	1, 2, 3	9	A04
Table 3.3.3-1 3.b	c. Containment Radiation – High	4	~~2~~	~~3~~ 4	1, 2, 3, 4	9	A04
	d. SIAS	----------------------------	(See Functional Unit 1 above)			-------------------------------	
	4. MAIN STEAM LINE ISOLATION (MSIS)						
	a. Manual (Trip Buttons)	2/steam generator	1/steam generator	2/operating steam generator	1, 2, 3, 4	8	See ITS 3.3.4
Table 3.3.3-1 4.a	b. Steam Generator Pressure – Low	~~4/steam generator~~	~~2/steam generator~~	~~3~~ 4/steam generator	1, 2, 3(c) Add Footnote (f)	9	A04 L01

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA02

A04

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	5. CONTAINMENT SUMP RECIRCULATION (RAS)						
	a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	8	See ITS 3.3.4
Table 3.3.3-1 5.a	b. Refueling Water Tank - Low	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	13	A04
	6. LOSS OF POWER						See ITS 3.3.5
	a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	
	b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	
	c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	
	7. AUXILIARY FEEDWATER (AFAS)						
	a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	11	See ITS 3.3.4
	b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	11	
Table 3.3.3-1 6.a. 6.b	c. SG Level (1A/1B) - Low	~~4/SG~~	~~2/SG~~	~~3~~/SG	1, 2, 3	14a, 14b, 15	A04
	8. AUXILIARY FEEDWATER ISOLATION						
Table 3.3.3-1 6.c	a. SG 1A – SG 1B Differential Pressure	~~4/SG~~	~~2/SG~~	~~3~~/SG	1, 2, 3	14a, 14b, 15	A04
Table 3.3.3-1 6.d	b. Feedwater Header 1A – 1B Differential Pressure	~~4/SG~~	~~2/SG~~	~~3~~/SG	1, 2, 3	14a, 15	A04

4

A01

TABLE 3.3-3 (Continued)

TABLE NOTATION

Add Table 3.3.3-1 Footnote (a) M01

Add Table 3.3.3-1 Footnote (b) M02

Table 3.3.3-1 Note (c) ~~(a)~~ ~~Trip function~~ Pressurizer Pressure - Low may be manually bypassed ~~in this MODE~~ when pressurizer pressure is < 1725 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1725 psia.

Table 3.3.3-1 Note (d) ~~(b)~~ ~~An~~ SIAS ~~signal~~ is also required as a permissive to initiate containment spray ~~first necessary to enable CSAS logic~~.

Table 3.3.3-1 Note (e) ~~(c)~~ ~~Trip function~~ Steam Generator Pressure - Low may be manually bypassed ~~in this MODE~~ when steam generator pressure is < ~~below~~ 685 psig; bypass shall be automatically removed whenever steam generator pressure is ≥ ~~at or above~~ 685 psig.

Add Table 3.3-1 Footnote (f) L01

Add proposed LCO 3.3.3 ACTIONS Note A02

ACTION STATEMENTS

ACTION 8 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.3.4

ACTION D (Condition)

ACTION 9 - ~~With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS, RAS or AFAS).

ACTION D.1 ~~a.~~ Place affected trip unit ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour. ~~For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to~~ 48 hours ~~from time of initial loss of OPERABILITY; however, the inoperable~~ channel ~~shall then be either~~ within

ACTION D.2.1 ACTION D.2.2 restore~~d~~ channel to OPERABLE status or place~~d~~ affected trip unit in ~~the~~ trip~~ped condition~~.

~~b.~~ ~~Within one hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.~~ A05

ACTION F ~~c.~~ With one or more Functions with two ESFAS trip unit or associated instrument channel (except CSAS or AFAS), ~~The Minimum Channels OPERABLE requirement is met; however,~~ one ~~additional~~ channel may be bypassed for up to 48 hours ~~while performing tests and maintenance on that channel~~ provided the other inoperable channel is placed in the tripped condition within 1 hour. L02

TABLE 3.3-3 (continued)

TABLE NOTATION

ACTION D (Condition)

ACTION 10A - ~~With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS, RAS or AFAS).

ACTION D.1

~~a.~~ Place affected trip unit ~~The inoperable channel is placed~~ in ~~the~~ bypassed or tripped ~~condition and the Minimum Channels OPERABLE requirement is demonstrated~~ within 1 hour. ~~If the inoperable channel can not be~~

ACTION D.2.1
ACTION D.2.2

restore~~d~~ channel to OPERABLE status within 48 hours, ~~then~~ or place ~~the inoperable channel~~ affected trip unit in ~~the~~ trip~~ped condition~~.

~~b. Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.~~ A05

ACTION E (Condition)

ACTION 10B - ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the~~ Two CSAS trip units or associated instrument channels inoperable.

ACTION E.1

Place one trip unit in ~~inoperable channels has been~~ bypass~~ed~~ and place the other ~~inoperable~~ trip unit ~~channel has been placed~~ in ~~the~~ trip~~ped condition~~ within 1 hour.

ACTION E.2

Restore one trip unit ~~of the inoperable channels~~ to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program,

ACTION I

or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and in ~~HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.4

ACTION 12 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

See ITS 3.3.5

A01

TABLE 3.3-3 (continued)

TABLE NOTATION

ACTION B (Condition)

ACTION 13 - ~~With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One Containment Sump Recirculation Actuation Signal (RAS) trip unit or associated instrument channel inoperable.

ACTION B.1
ACTION B.2

Place affected trip unit ~~a.~~ ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour. ~~If OPERABILITY cannot be~~ restore~~d~~ trip unit to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and in ~~HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION I

ACTION F

With one or more Functions with two ESFAS trip unit or associated instrument channel (except CSAS or AFAS), ~~The Minimum Channels OPERABLE requirement is met; however,~~ one ~~additional~~ channel may be bypassed ~~for up to 2 hours while performing tests and maintenance on that channel~~ provided the other inoperable channel is placed in the tripped condition within 1 hour.

L02

ACTION C NOTE (Condition)

NOTE Required Action C.2.2.2 must be completed whenever this Condition is entered.

A07

ACTION C (Condition)

ACTION 14 - ~~With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) trip unit or associated instrument channel inoperable.

ACTION C.1

Place affected trip unit ~~a.~~ ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour. ~~If an inoperable SG level channel can not be~~

LA03

ACTION C.2.1
ACTION C.2.2.1

restore~~d~~ trip unit to OPERABLE status within 48 hours, ~~then AFAS-1 or AFAS-2 as applicable in the inoperable channel shall be~~ place~~d~~ affected trip unit in ~~the~~ bypass~~ed condition~~ within 48 hours. ~~If an inoperable SG DP or FW Header DP channel can not be~~

LA03

ACTION C.2.1
ACTION C.2.2.1

restore~~d~~ trip unit to OPERABLE status within 48 hours, ~~then both AFAS-1 and AFAS-2 in the inoperable channel shall be~~ place~~d~~ affected trip unit in ~~the~~ bypass~~ed condition~~.

ACTION C.2.2.2

~~The~~ Restore channel ~~shall be returned~~ to OPERABLE status ~~no later than during the next COLD SHUTDOWN~~ Prior to entering MODE 3 following next MODE 5 entry.

A07

~~b.~~ ~~Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.~~

A05

ACTION E (Condition)

ACTION 15 - ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels~~ One or more Functions with two AFAS trip units or associated instrument channels inoperable.

ACTION E.1

Place one trip unit in ~~has been~~ bypass~~ed~~ and ~~the other inoperable channel has been~~ place~~d~~ one trip unit in ~~the~~ trip~~ped condition~~ within 1 hour.

ACTION E.2

Restore one ~~of the inoperable channels~~ trip unit to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and in ~~HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION I

Add proposed ACTIONS G and H L03

Add proposed ACTION I for SIAS, CIS, MSIS, and RAS A06

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

	FUNCTIONAL UNIT	~~TRIP SETPOINT~~	ALLOWABLE VALUES	
	1. SAFETY INJECTION (SIAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 1.a	b. Containment Pressure – High	~~≤ 5 psig~~	≤ 5 psig	
Table 3.3.3-1 1.b	c. Pressurizer Pressure – Low	~~≥ 1600 psia~~	≥ 1600 psia	
	2. CONTAINMENT SPRAY (CSAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 2.a	b. Containment Pressure – High-High	~~≤ 10 psig~~	≤ 10 psig	
	3. CONTAINMENT ISOLATION (CIS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 3.a	b. Containment Pressure – High	~~≤ 5 psig~~	≤ 5 psig	
Table 3.3.3-1 3.b	c. Containment Radiation – High	~~≤ 10 R/hr~~	≤ 10 R/hr	
	d. SIAS	-------------------------(See FUNCTIONAL UNIT 1 above)-----------------------		
	4. MAIN STEAM LINE ISOLATION (MSIS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 4.a	b. Steam Generator Pressure – Low	~~≥ 585 psig~~	≥ 585 psig	
	5. CONTAINMENT SUMP RECIRCULATION (RAS)			
	a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 5.a	b. Refueling Water Tank – Low	~~48 inches above tank bottom~~	48 inches above tank bottom	

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

		FUNCTIONAL UNIT	**~~TRIP VALUE~~**	**ALLOWABLE VALUES**	
	6.	LOSS OF POWER			See ITS 3.3.5
		a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	≥ 2900 volts with a 1 ± .5 second time delay	≥ 2900 volts with a 1 ± .5 second time delay	
		b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	≥ 3831 volts with a 18 ± 2 second time delay	≥ 3831 volts with a 18 ± 2 second time delay	
		c. 480 volts Emergency Bus Undervoltage (Degraded Voltage)	≥ 415 volts with a ≤ 9 second time delay	≥ 415 volts with a ≤ 9 second time delay	
	7.	AUXILIARY FEEDWATER (AFAS)			
		a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
		b. Automatic Actuation Logic	Not Applicable	Not Applicable	
Table 3.3.3-1 6.a, 6.b		c. SG 1A & 1B Level Low	~~≥ 19.0%~~	≥ 18.0 %	
	8.	AUXILIARY FEEDWATER ISOLATION			
Table 3.3.3-1 6.c		a. Steam Generator ΔP – High	~~≤ 275 psid~~	89.2 to 281 psid	
Table 3.3.3-1 6.d		b. Feedwater Header High ΔP	~~≤ 150.0 psid~~	56.0 to 157.5 psid	

A01

~~DELETED~~

A01

~~DELETED~~

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	CHANNEL CHECK (SR 3.3.3.1)	CHANNEL CALIBRATION (SR 3.3.3.4)	CHANNEL FUNCTIONAL TEST (SR 3.3.3.2)	MODES IN WHICH SURVEILLANCE REQUIRED	
SR 3.3.3.3 SR 3.3.3.5	1. SAFETY INJECTION (SIAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	c. Pressurizer Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	
	d. Automatic Actuation Logic	N.A.	N.A.	SFCP(1)	1, 2, 3	See ITS 3.3.4
SR 3.3.3.5	2. CONTAINMENT SPRAY (CSAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Containment Pressure – –– High-High	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1)	1, 2, 3	See ITS 3.3.4
SR 3.3.3.5	3. CONTAINMENT ISOLATION (CIS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	c. Containment Radiation – High	SFCP	SFCP	SFCP	1, 2, 3, 4	
	d. Automatic Actuation Logic	N.A.	N.A.	SFCP(1)	1, 2, 3	See ITS 3.3.4
	e. SIAS	N.A.	N.A.	SFCP	N.A.	
SR 3.3.3.3 SR 3.3.3.5	4. MAIN STEAM LINE ISOLATION (MSIS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1)	1, 2, 3	See ITS 3.3.4
SR 3.3.3.5	5. CONTAINMENT SUMP RECIRCULATION (RAS)					
	a. Manual RAS (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Refueling Water Storage Tank – Low	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1)	1, 2, 3	See ITS 3.3.4

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK (SR 3.3.3.1)	CHANNEL CALIBRATION (SR 3.3.3.4)	FUNCTIONAL TEST (SR 3.3.3.2)	MODES IN WHICH SURVEILLANCE REQUIRED	
6. LOSS OF POWER					See ITS 3.3.5
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
c. 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.3.5 7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	
c. Automatic Actuation Logic	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
SR 3.3.3.5 8. AUXILIARY FEEDWATER ISOLATION					
a. SG Level (A/B) – Low and SG Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	
b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	

TABLE 4.3-2 (Continued)

TABLE NOTATION

(1) The logic circuits shall be tested manually in accordance with the Surveillance Frequency Control Program.

See ITS 3.3.4

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.3
Table 3.3.3-1

~~3.3.2~~ The Engineered Safety Features Actuation System (ESFAS) instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4~~. LA01

LCO 3.3.3
Table 3.3.3-1

APPLICABILITY: As shown in Table 3.3-3.

Add proposed ITS 3.3.3 ACTIONS Note A02

ACTION:

Table 3.3.3-1

ACTIONS for
* Table 3.3.3-1 Functions 1-6

Table 3.3.3-1
Note (b)

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTIONS for
* Table 3.3.3-1 Functions 1-6

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1, SR 3.3.3.4,
SR 3.3.3.2
Table 3.3.3-1

~~4.3.2.1~~ Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES ~~and at the frequencies~~ shown in Table 4.3-2.

In accordance with the Surveillance Frequency Control Program

Table 3.3.3-1
SR 3.3.3.3

SR 3.3.3.4

~~4.3.2.2~~ The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. ~~The total bypass function shall be demonstrated OPERABLE~~ in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing ~~of each channel affected by bypass operation~~. A03

include the bypass removal functions

Table 3.3.3-1
SR 3.3.3.5

~~4.3.2.3~~ The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. ~~Each test shall include at least one channel per function.~~ A03

ACTIONS for associated
*Table 3.3.3-1 Functions 1-6
ACTION A,E,I – CSAS
ACTION B,F,I – RAS
ACTION C,E,I – AFAS
ACTION C,E,I – AUX FW ISOL
ACTION D,F,I – SIAS, CIAS, MSIS
ACTION G,H,I – BYPASSES

A01

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA02

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
1. SAFETY INJECTION (SIAS)						
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
Table 3.3.3-1 1.a — b. Containment Pressure – High	4	~~2~~	~~3~~ 4	1, 2, 3	13, 14	A04
Table 3.3.3-1 1.b — c. Pressurizer Pressure – Low	4	~~2~~	~~3~~ 4	1, 2, 3(a)	13, 14	A04
d. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
2. CONTAINMENT SPRAY (CSAS)						
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
Table 3.3.3-1 2.a — b. Containment Pressure – High-High	4	~~2~~	~~3~~ 4	1(b), 2(b), 3(b)	18A, 18B	A04
c. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
3. CONTAINMENT ISOLATION (CIAS)						
a. Manual CIAS (Trip Buttons)	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
b. Safety Injection (SIAS)	See Functional Unit 1 for all Safety Injection Initiating Functions and Requirements					
Table 3.3.3-1 3.a — c. Containment Pressure – High	4	~~2~~	~~3~~ 4	1, 2, 3	13, 14	A04
Table 3.3.3-1 3.b — d. Containment Radiation – High	4	~~2~~	~~3~~ 4	1, 2, 3	13, 14	A04
e. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA02 A04

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	4. MAIN STEAM LINE ISOLATION (MSIS)						
	a. Manual (Trip Buttons)	2	1	2	1, 2, 3	16	See ITS 3.3.4
Table 3.3.3-1 4.a	b. Steam Generator Pressure – Low	~~4/steam generator~~	~~2/steam generator~~	~~3~~ 4/steam generator	1, 2, 3(c)	13, 14	A04
Table 3.3.3-1 4.b	c. Containment Pressure – High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	13, 14	A04
	d. Automatic Actuation Logic	2	1	2	1, 2, 3	12	See ITS 3.3.4
	5. CONTAINMENT SUMP RECIRCULATION (RAS)						
	a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	12	See ITS 3.3.4
Table 3.3.3-1 5.a	b. Refueling Water Tank - Low	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	19	A04
	c. Automatic Actuation Logic	2	1	2	1, 2, 3	12	See ITS 3.3.4

Add Footnote (f) L01

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA02 A04

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	REQUIRED APPLICABLE MODES	ACTION	
6. LOSS OF POWER (LOV)						See ITS 3.3.5
a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	17A	
(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B	
b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B	
(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B	
7. AUXILIARY FEEDWATER (AFAS)						
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	15	See ITS 3.3.4
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	15	
Table 3.3.3-1 6.a, 6.b — c. SG Level (2A/2B) – Low	~~4/SG~~	~~2/SG~~	~~3~~ 4/SG	1, 2, 3	20a, 20b, 21	A04
8. AUXILIARY FEEDWATER ISOLATION						
Table 3.3.3-1 6.c — a. SG 2A – SG 2B Differential Pressure	~~4/SG~~	~~2/SG~~	~~3~~ 4/SG	1, 2, 3	20a, 20b, 21	A04
Table 3.3.3-1 6.d — b. Feedwater Header 2A – 2B Differential Pressure	~~4/SG~~	~~2/SG~~	~~3~~ 4/SG	1, 2, 3	20a, 21	A04

TABLE 3.3-3 (Continued)

TABLE NOTATION

Table 3.3.3-1 Note (c) ~~(a)~~ ~~Trip function~~ Pressurizer Pressure - Low may be manually bypassed ~~in this MODE~~ when pressurizer pressure is less than 1836 psia; bypass shall be automatically removed when pressurizer pressure is greater than or equal to 1836 psia.

Table 3.3.3-1 Note (d) ~~(b)~~ ~~An~~ SIAS ~~signal~~ is also required as a permissive to initiate containment spray ~~first necessary to enable CSAS logic~~.

Table 3.3.3-1 Note (e) ~~(c)~~ ~~Trip function~~ Steam Generator Pressure - Low may be manually bypassed ~~in this MODE~~ when steam generator pressure is < ~~below~~ 700 psia; bypass shall be automatically removed whenever steam generator pressure is ≥ ~~at or above~~ 700 psia.

Add proposed LCO 3.3.3 ACTIONS Note L01

ACTION OF STATEMENTS

ACTION 12 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. See ITS 3.3.4

ACTION D (Condition) NOTE — NOTE Required Action D.2 must be completed whenever this Condition is entered. A07

ACTION D (Condition) — One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS, RAS or AFAS).

ACTION 13 - ~~With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the~~

ACTION D.1 Place affected trip unit ~~inoperable channel is placed~~ in ~~the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour.

ACTION D.2 Restore ~~The~~ channel ~~shall be returned~~ to OPERABLE status Prior to entering MODE 3 following next MODE 5 entry ~~no later than during the next COLD SHUTDOWN~~. A07

~~With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below.~~ A05

~~Process Measurement Circuit~~	~~Functional Unit Bypassed~~
~~1. Containment Pressure -~~	~~Containment Pressure – High (SIAS, CIAS, CSAS)~~ ~~Containment Pressure – High (RPS)~~
~~2. Steam Generator Pressure -~~	~~Steam Generator Pressure – Low (MSIS)~~ ~~AFAS-1 and AFAS-2 (AFAS)~~ ~~Thermal Margin/Low Pressure (RPS)~~ ~~Steam Generator Pressure – Low (RPS)~~
~~3. Steam Generator Level -~~	~~Steam Generator Level – Low (RPS)~~ ~~If SG-2A, then AFAS-1 (AFAS)~~ ~~If SG-2B, then AFAS-2 (AFAS)~~
~~4. Pressurizer Pressure -~~	~~Pressurizer Pressure – High (RPS)~~ ~~Pressurizer Pressure – Low (SIAS)~~ ~~Thermal Margin/Low Pressure (RPS)~~

LA04

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION F (Condition)

ACTION 14 - ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:~~ One or more Functions with two ESFAS trip unit or associated instrument channel (except CSAS or AFAS).

ACTION F.1

Place one trip unit in

~~a.~~ ~~Verify that one of the inoperable channels has been~~ bypass~~ed~~ and place the other trip unit ~~inoperable channel~~ in ~~the~~ trip~~ped condition~~ within 1 hour.

Add proposed ACTION F.2 L02

A04

~~b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below.~~

LA04

~~**Process Measurement Circuit**~~	~~**Functional Unit Bypassed/Tripped**~~
~~1. Containment Pressure -~~	~~Containment Pressure – High (SIAS, CIAS, CSAS)~~ ~~Containment Pressure – High (RPS)~~
~~2. Steam Generator Pressure -~~	~~Steam Generator Pressure – Low (MSIS)~~ ~~AFAS-1 and AFAS-2 (AFAS)~~ ~~Thermal Margin/Low Pressure (RPS)~~ ~~Steam Generator Pressure – Low (RPS)~~
~~3. Steam Generator Level -~~	~~Steam Generator Level – Low (RPS)~~ ~~If SG-2A, then AFAS-1 (AFAS)~~ ~~If SG-2B, then AFAS-2 (AFAS)~~
~~4. Pressurizer Pressure -~~	~~Pressurizer Pressure – High (RPS)~~ ~~Pressurizer Pressure – Low (SIAS)~~ ~~Thermal Margin/Low Pressure (RPS)~~

ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 16 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

See ITS 3.3.4

ACTION 17A - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or place the inoperable channel in the tripped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

See ITS 3.3.5

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 17B - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or place the inoperable channel in the tripped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

See ITS 3.3.5

ACTION D (Condition)

ACTION 18A - ~~With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS, RAS or AFAS).

ACTION D.1

~~a.~~ Place affected trip unit ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition and the Minimum Channels OPERABLE requirement is demonstrated~~ within 1 hour.

ACTION D.2.1
ACTION D.2.2

~~If the inoperable channel can not be~~ restore~~d~~ channel to OPERABLE status within 48 hours, ~~then~~ or place ~~the inoperable channel~~ affected trip unit in ~~the~~ trip~~ped condition~~.

~~b. With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed in ACTION 13.~~ A05

ACTION E (Condition)

ACTION 18B - ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the~~ Two CSAS trip units or associated instrument channels inoperable.

ACTION E.1

Place one trip unit in ~~inoperable channels has been~~ bypass~~ed~~ and place the other ~~inoperable channel~~ trip unit ~~has been placed~~ in ~~the~~ trip~~ped condition~~ within 1 hour.

ACTION E.2

Restore one ~~of the inoperable channels~~ trip unit to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program,

ACTION I

or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and ~~in HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION B (Condition)

ACTION 19 - ~~With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~ One Containment Sump Recirculation Actuation Signal (RAS) trip unit or associated instrument channel inoperable.

ACTION B.1
ACTION B.2

a. Within 1 hour place affected trip unit ~~the inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~. ~~If OPERABILITY cannot be~~ restore~~d~~ trip unit to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program,

ACTION I

be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and in ~~HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION F

With one or more Functions with two ESFAS trip unit or associated instrument channel (except CSAS or AFAS). ~~The Minimum Channels OPERABLE requirement is met; however,~~ one ~~additional~~ channel may be bypassed ~~for up to 2 hours for surveillance testing per Specification 4.3.2.1~~ within 1 hour. L02

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION C NOTE (Condition) — NOTE Required Action C.2.2.2 must be completed whenever this Condition is entered. A07

ACTION C (Condition) — One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) trip unit or associated instrument channel inoperable.

ACTION 20 - ~~With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:~~

ACTION C.1 — ~~a.~~ Place affected trip unit ~~The inoperable channel is placed~~ in ~~either the~~ bypass~~ed~~ or trip~~ped condition~~ within 1 hour.

ACTION C.2.1 — ~~If an inoperable SG level channel can not be~~ Restore trip unit ~~d~~ to OPERABLE status within 48 hours, ~~then AFAS-1 or AFAS-2 as applicable in the inoperable channel shall be~~ OR place~~d~~ affected trip unit in ~~the~~ bypass~~ed condition~~. within LA03

ACTION C.2.1 — ~~If an inoperable SG DP or FW Header DP channel can not be~~ Restore trip unit ~~d~~ to OPERABLE status within 48 hours, ~~then both AFAS-1 and AFAS-2 in the inoperable channel shall be~~ place~~d~~ affected trip unit in ~~the~~ bypass~~ed condition~~. LA03

ACTION C.2.2.2 — Restore ~~The~~ channel ~~shall be returned~~ to OPERABLE status ~~no later than during the next COLD SHUTDOWN~~ Prior to entering MODE 3 following next MODE 5 entry. A07

~~b With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed in ACTION 13.~~ A05

ACTION E (Condition) — One or more Functions with two AFAS trip units or associated instrument channels inoperable.

ACTION 21 - ~~With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been~~ Place one trip unit in bypass~~ed~~ and ~~the other inoperable channel~~ place~~d~~ one trip unit in ~~the~~ trip~~ped condition~~ within 1 hour.

ACTION E.1 — Restore one trip unit ~~of the inoperable channels~~ to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program,

ACTION E.2 — or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and in ~~HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours.

ACTION I

Add proposed ACTIONS G and H L03

Add proposed ACTION I for SIAS, CIS, MSIS, CSAS, and AFAS A06

TABLE 3.3-4

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

	FUNCTIONAL UNIT	~~**TRIP SETPOINT**~~	**ALLOWABLE VALUES**	
	1. SAFETY INJECTION (SIAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 1.a	b. Containment Pressure – High	~~≤ 3.5 psig~~	≤ 3.6 psig	
Table 3.3.3-1 1.b	c. Pressurizer Pressure – Low	~~≥ 1736 psia~~	≥ 1728 psia	
	d. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	2. CONTAINMENT SPRAY (CSAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 2.a	b. Containment Pressure – High-High	~~≤ 5.40 psig~~	≤ 5.50 psig	
	c. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	3. CONTAINMENT ISOLATION (CIAS)			
	a. Manual CIAS (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
	b. Safety Injection (SIAS)	Not Applicable	Not Applicable	
Table 3.3.3-1 3.a	c. Containment Pressure – High	~~≤ 3.5 psig~~	≤ 3.6 psig	
Table 3.3.3-1 3.b	d. Containment Radiation – High	~~≤ 10 R/hr~~	≤ 10 R/hr	
	e. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	4. MAIN STEAM LINE ISOLATION			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 4.a	b. Steam Generator Pressure – Low	~~≥ 600 psia~~	≥ 567 psia	
Table 3.3.3-1 4.b	c. Containment Pressure – High	~~≤ 3.5 psig~~	≤ 3.6 psig	
	d. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

	FUNCTIONAL UNIT	~~TRIP VALUE~~	ALLOWABLE VALUES	
	5. CONTAINMENT SUMP RECIRCULATION (RAS)			
	a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
Table 3.3.3-1 5.a	b. Refueling Water Tank – Low	~~5.67 feet above tank bottom~~	4.62 feet to 6.24 feet above tank bottom	
	c. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	6. LOSS OF POWER			
	a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	$\geq$ 3120 volts	$\geq$ 3120 volts	See ITS 3.3.5
	(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	$\geq$ 360 volts	$\geq$ 360 volts	
	b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	$\geq$ 3848 volts with < 10-second time delay	$\geq$ 3848 volts with < 10-second time delay	
	(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	$\geq$ 432 volts	$\geq$ 432 volts	
	7. AUXILIARY FEEDWATER (AFAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
	b. Automatic Actuation Logic	Not Applicable	Not Applicable	
Table 3.3.3-1 6.a, 6.b	c. SG 2A & 2B Level Low	~~$\geq$ 19.0%~~	$\geq$ 18.0 %	
	8. AUXILIARY FEEDWATER ISOLATION			
Table 3.3.3-1 6.c	a. Steam Generator ΔP – High	~~$\leq$ 275 psid~~	89.2 to 281 psid	
Table 3.3.3-1 6.d	b. Feedwater Header ΔP – High	~~$\leq$ 150.0 psid~~	56.0 to 157.5 psid	

A01

~~DELETED~~

A01

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TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	SR 3.3.3.1 CHANNEL CHECK	SR 3.3.3.4 CHANNEL CALIBRATION	SR 3.3.3.2 CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
SR 3.3.3.3 SR 3.3.3.5	1. SAFETY INJECTION (SIAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3, 4	See ITS 3.3.4
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	c. Pressurizer Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	
	d. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(3)	1, 2, 3, 4	See ITS 3.3.4
SR 3.3.3.5	2. CONTAINMENT SPRAY (CSAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3, 4	See ITS 3.3.4
	b. Containment Pressure – High-High	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(3)	1, 2, 3, 4	See ITS 3.3.4
SR 3.3.3.5	3. CONTAINMENT ISOLATION (CIAS)					
	a. Manual CIAS (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3, 4	See ITS 3.3.4
	b. Safety Injection SIAS	N.A.	N.A.	SFCP	1, 2, 3, 4	
	c. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	d. Containment Radiation – High	SFCP	SFCP	SFCP	1, 2, 3	
	e. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(3)	1, 2, 3, 4	See ITS 3.3.4
SR 3.3.3.3 SR 3.3.3.5	4. MAIN STEAM LINE ISOLATION					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
	b. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	
	c. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	d. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(3)	1, 2, 3, 4	See ITS 3.3.4
SR 3.3.3.5	5. CONTAINMENT SUMP RECIRCULATION (RAS)					
	a. Manual RAS (Trip Buttons)	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.4
	b. Refueling Water Tank – Low	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(3)	1, 2, 3	See ITS 3.3.4

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	SR 3.3.3.1 CHANNEL CHECK	SR 3.3.3.4 CHANNEL CALIBRATION	SR 3.3.3.2 CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	6. LOSS OF POWER (LOV)					See ITS 3.3.5
	a. 4.16 kV and 480 V Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	
	b. 4.16 kV and 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	
SR 3.3.3.5	7. AUXILIARY FEEDWATER (AFAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
	b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(2)	1, 2, 3	See ITS 3.3.4
SR 3.3.3.5	8. AUXILIARY FEEDWATER ISOLATION					
	a. SG Level (A/B) – Low and SG Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	
	b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	

TABLE NOTATION

See ITS 3.3.4

(1) Testing of Automatic Actuation Logic shall include energization/de-energization of each initiation relay (solid-state component) and verification of the OPERABILITY of each initiation relay (solid-state component).

(2) An actuation relay test shall be performed which shall include the energization/de-energization of each actuation relay and verification of the OPERABILITY of each actuation relay.

(3) A subgroup relay test shall be performed which shall include the energization/de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay. Testing of the ESFAS subgroup relays shall be performed in accordance with the Surveillance Frequency Control Program.

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2, Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications-Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS Table 3.3-3 Actions describe the actions to be taken when ESFAS Function instrument channels are inoperable. ITS 3.3.3 also describes Actions to be taken when ESFAS Function instrument channels are inoperable and contains a note that separate condition entry is allowed for each ESFAS Function. This changes the CTS by adding a Note stating that separate condition entry is allowed for each Function, those ESFAS Functions being the SIAS, CSAS, CIS (Unit 1) and CIAS (Unit 2), MSIS, RAS, and AFAS Functions.

The purpose of the CTS Actions is to provide the appropriate compensatory actions for inoperable ESFAS Functions. This proposed change will allow separate condition entry for each ESFAS Function. The Note clarifies that ESFAS Functions are treated as separate entities, each with separate Completion Times. In addition, the AFAS Functions are allowed separate Condition entry on a per steam generator basis since the channels associated with each steam generator will provide the associated AFAS trip based on the logic associated with the channels on a steam generator basis. This change is acceptable because it clearly states the current requirement. The CTS considers each ESFAS Function to be separate and independent from the others. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 Unit 1 CTS 4.3.2.1.2 and Unit 2 CTS 4.3.2.2 require the logic for the bypasses to be demonstrated OPERABLE during the at-power CHANNEL FUNCTIONAL TEST. These Surveillance Requirements also require, “The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.” Unit 1 CTS 4.3.2.1.3 and Unit 2 CTS 4.3.2.3 require ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME testing for each ESFAS function and includes a statement that each test shall include at least one channel per function. ITS SR 3.3.3.3 requires a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function. ITS SR 3.3.3.4 requires a CHANNEL CALIBRATION of each ESFAS instrument channel, including bypass removal functions. These ITS Surveillances do not explicitly state that the total bypass function shall be demonstrated OPERABLE during the Channel Calibration test of each channel affected by bypass operation or that the ESF RESPONSE TIME test must include at least one channel per function.

The purpose of the CTS statements in the Surveillance Requirements associated with the CHANNEL FUNCTIONAL TEST of the bypass channels and the ESF RESPONSE TIME test is to ensure required features are tested to verify the ESFAS instrument Functions are OPERABLE. However, these statements are redundant to the definition of a CHANNEL FUNCTIONAL TEST and ESF RESPONSE TIME provided in ITS Section 1.1 and therefore are not necessary.

The definition of a CHANNEL FUNCTIONAL TEST states, in part, that the test "…may be performed by means of any series of sequential, overlapping, or total channel steps, and each step must be performed within the Frequency in the Surveillance Frequency Control Program for the devices included in the step." Thus, the definition, combined with the requirement to include the bypass removal function in the CHANNEL CALIBRATION, ensures the total bypass function is demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

The definition of the ESF RESPONSE TIME states, in part, that the test, "…shall be that time interval from FEATURE (ESF) RESPONSE when the monitored parameter exceeds its ESF actuation TIME setpoint at the channel sensor until the ESF equipment is capable of performing its safety function. This encompasses the requirement that at least once channel per Function be included in an ESF RESPONSE TIME. The required testing will continue, per the ITS SR wording and the definitions provided in Section 1.1, to include the features necessary to verify the ESFAS instrument Functions are OPERABLE.

This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.3-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. DOC LA01 describes the change that moves the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases. This changes the CTS by changing the "MINIMUM CHANNELS OPERABLE" column to "REQUIRED CHANNELS OPERABLE" and changing the number of channels to four (4) channels for those Functions with a "MINIMUM CHANNELS OPERABLE" criteria less than four (4) channels. Additionally, the revised "MINIMUM CHANNELS OPERABLE" criteria are moved to the ITS 3.3.3~~.~~ LCO statement and the "MINIMUM CHANNELS OPERABLE" column is not included in ITS Table 3.3.3-1. This change is designated as administrative because it does not result in a technical change to the CTS.

A05 Unit 1 CTS Table 3.3-3, Actions 9.b, 10A.b, 14.b, and Unit 2 CTS Table 3.3-3, Actions 13, 14.b, 20.b state, in part, that all functional units receiving an input from the inoperable channel are also bypassed or tripped. The ITS instrumentation format is presented by Functions based on parameters the channels sense and systems the instrument Functions actuate. As a result, when a functional unit impacts OPERABILITY of multiple ESFAS Functions, each Function is addressed separately and independently depending on the nature of the inoperability. ITS 3.3.3 ACTIONS are applied to each Function, as applicable, and include a Required Action to place the affected trip unit in trip or bypass within 1 hour, as appropriate. CTS 3.0.2 (ITS LCO 3.0.2) establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. Therefore, when a common instrument becomes inoperable, LCO 3.0.2 requires each Function affected by the inoperability to be declared inoperable and the associated ACTIONS shall be met. The additional clarifying statement in the CTS Actions is not necessary and is not included in the presentation of the ITS 3.3.3 ACTIONS. This change is designated as administrative because it does not result in a technical change to the CTS.

A06 Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 do not contain a default action to perform when the Table 3.3-3 Actions cannot be completed within the required time; therefore, an entry into CTS 3.0.3 would be required. ITS 3.3.3 ACTION H requires the unit to be in MODE 3 in 6 hours and MODE 4 in 12 hours when one or more Required Actions is not met within its associated Completion Time. This changes the CTS by explicitly stating shutdown ACTIONS when actions cannot be performed within the required time.

The purpose of ITS 3.3.3 ACTION I is to ensure the plant is brought to a MODE in which the LCO for the ESFAS Functions does not apply within a reasonable amount of time in a controlled manner because the Technical Specification actions cannot be completed as required. Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 are silent on these actions, deferring to CTS 3.0.3 for the actions to accomplish this. The proposed change is acceptable because the ACTIONS specified in ITS 3.3.3 adopt the ISTS structure for placing the unit outside the MODE of Applicability without changing the time specified to enter MODE 3 or MODE 4. A default Condition eliminates the need to LCO 3.0.3 when one or more Required Actions cannot be met within the associated Completion Times. This change is designated as administrative because it does not result in a technical change to the CTS.

A07 Unit 1 CTS 3.3.2.1 Table 3.3-3 Action 14, and Unit 2 CTS 3.3.2 Table 3.3-3 Action 20 provide actions when one channel of an AFAS Function is inoperable. CTS 3.3.2 Table 3.3-3 Action 13 also provides actions when one channel of an SIAS, CIAS, or MSIS Function is inoperable. These CTS Actions state in part, "The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN." ITS 3.3.3 ACTIONS C and D include this action to restore the channel to OPERABLE with a Completion Time of, "Prior to entering MODE 3 following the following next MODE 5 entry." This presentation preference is similar to the Completion Time specified in ISTS 3.3.5 (Digital), Required Action A.2. ITS 3.3.3, Conditions C and D are modified by a Note which requires the action to restore the channel to OPERABLE status within the Completion Time to be performed whenever the Condition is entered. This changes the CTS by explicitly stating that the Required Action must be performed within the Completion Time whenever the condition is entered.

This change is necessary to eliminate the conflict with the general CTS 3.0.2 (ITS LCO 3.0.2) requirement that if the LCO is met or is no longer applicable prior to expiration of the specified time interval(s), completion of the ACTIONS is not required, unless otherwise stated. The addition of the Note constitutes an "unless otherwise stated." The Note will require the action to be completed within the Completion Time even when the LCO is no longer applicable, to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions. This change is acceptable because it reflects the current understanding and application of the CTS Actions requiring the applicable channel to be restored to OPERABLE status whenever the LCO is not met.

This change is designated as administrative as it clarifies the current understanding of the CTS requirement while providing an "unless otherwise stated," to the requirements of CTS 3.0.2 (ITS LCO 3.0.2).

MORE RESTRICTIVE CHANGES

M01 Unit 1 CTS 3.3.2.1 Action a. and Unit 2 CTS 3.3.2 Action a. state, in part, that with an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable. ITS Table 3.3.3-1 Footnote (a) states, "If the as-found channel setpoint is outside its predefined as-found acceptance criteria, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service." ITS 3.3.3 Bases, referring to the Allowable Values, states: "This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value." ITS Section 3.3.3 Bases also states, "If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found acceptance criteria band (e.g., conservative side of the as-found acceptance criteria band), the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the Nominal Trip Setpoint (NTSP) (within the allowed tolerance), and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance." This changes the CTS by requiring an evaluation of channel functionality (extent of which is expanded on in the TS Bases) prior to returning it to service in addition to the as-found value being conservative to the Allowable Value.

The purpose of this Note is to address a concern that the Technical Specification requirements for Limiting Safety System Settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. This change is consistent with the ISTS. This change is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

M02 Unit 1 CTS 3.3.2.1 Action a. and Unit 2 CTS 3.3.2 Action a. state, in part, that with an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1.1 until the channel is restored to OPERABLE status "with its trip setpoint adjusted consistent with the Trip Setpoint value." ITS Table 3.3.3-1 Footnote (b) states, "The instrument channel setpoint shall be reset to a value that is within the as-left acceptance criteria around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall not be returned to OPERABLE status. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left acceptance criteria apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left acceptance criteria are specified in the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report." This changes the CTS by providing more detailed information describing what "consistent with the Trip Setpoint" means and states a specific location where the methodology for determining the double-sided NTSP instrument tolerance bands is located.

The purpose of this Note is to address a concern that the Technical Specification requirements for LSSS may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will always actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. This change is consistent with the ISTS and is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.2.1 Table 3.3-4, ESFAS Instrumentation Trip Values, has two columns stating trip setpoints and allowable values for each Function. Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.2.1 require the ESFAS instrumentation setpoints to be set consistent with the Trip Setpoint values shown in Table 3.3-4. However, the CTS Action is only required to be taken when the setpoint is less conservative than the Allowable Value column of Table 3.3-4. When the setpoint is less conservative than the Allowable Value, the channel is to be declared inoperable and adjusted consistent with the Trip Setpoint value. CTS Table 3.3-4 specifies both the Trip Setpoints and Allowable Values for the ESFAS Instrumentation Functional Units. ITS 3.3.3 requires the ESFAS instrumentation for each Function in Table 3.3.3-1 to be OPERABLE. ITS Table 3.3.3-1 specifies only the Allowable Values for the RPS Instrumentation Functions. The Allowable Values represent the OPERABILITY limit of the channels in ITS. This changes the CTS by moving the Trip Setpoints to the Technical Requirements Manual (TRM).

The purpose of the trip setpoint requirements is to ensure required automatic safety systems are actuated to protect against violating core design limits, breaching the Reactor Coolant System pressure boundary, and to mitigate accidents. Pursuant to 10 CFR 50.36(c)(1)(ii)(A), if it is determined that an automatic protective device for a variable on which a safety limit has been placed (i.e., limiting safety system setting) does not function as required, appropriate action is taken to ensure the abnormal situation is corrected before a safety limit is exceeded, which may include shutting down the reactor. The PSL Instrument Setpoint Methodology calculates Nominal Trip Setpoints (NTSPs) using methods consistent with the guidance provided in NRC Regulatory Guide 1.105,"Setpoints For Safety-Related Instrumentation," and ANSI/ISA Standard 67.04, "Setpoints for Nuclear Safety-Related Instrumentation." Additionally, pre-defined limits (double-sided Operability limits and as-left limits) are determined for each instrument consistent with the guidance provided in NRC Regulatory Guide 1.105 and ANSI/ISA–RP67.04, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation." The instrument Operability limit band in plant uncertainty calculations is synonymous with the as-found acceptance criteria band specified in ITS and is centered about the nominal equipment setting (clarified in calculations as the field trip setpoint or NTSP). The PSL

Instrument Setpoint Methodology, including the method of determining instrument uncertainties, was reviewed by the NRC during the review of Extended Power Uprate (EPU) as documented in the EPU safety evaluations for License Amendments 213 (Unit 1) and 163 (Unit 2), dated July 9, 2012 and September 4, 2012, respectively (NRC ADAMS Accession Nos. ML12181A019 and ML12235A463). The NRC staff determined that the PSL Instrument Setpoint Methodology described in the EPU license request meets the requirements of 10 CFR 50, Appendix A, General Design Criterion 13 and the regulatory guidance in RG 1.105 (EPU SE pg. 92 (Unit 1) and 95 (Unit 2)). The NRC staff also determined that the application of the clarifications of RG 1.105 in Regulatory Issue Summary 2006-17 “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” is acceptable (EPU SE pg. 94 (Unit 1) and 97 (Unit 2)).

The removal of these details for meeting Technical Specification requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Allowable Values associated with the ESFAS Instrumentation, which are designated as the Operability limits for the required instrument Functions. Footnotes (a) and (b) in Table 3.3.3-1 are added ensure channel performance continues to verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology consistent with the NRC guidance specified in Regulatory Issue Summary 2006-17. Also, this change is acceptable because these types of procedural details will be adequately controlled in the TRM. Any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA02 (*Type 1 – Removing Details of System Design and System Description, Including Design Limits*) CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.4-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases. The MINIMUM CHANNELS OPERABLE” column is deleted as described in discussion of change (DOC) A04.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA03 (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS Table 3.3-3 Action 14.a (Unit 1) and 20.a (Unit 2) require, in part, AFAS-1 or AFAS-2 associated with the inoperable channel to be placed in the bypass position when a steam generator (SG) level AFAS channel cannot be restored to OPERABLE status within the 48 hours. These CTS actions also require both AFAS-1 and AFAS-2 associated with the inoperable channel to be placed in the bypass position when a SG differential pressure or feedwater header differential pressure AFAS channel cannot be restored to OPERABLE status within the 48 hours. ITS 3.3.3 Required Action B.2.2 requires, in part, to place the affected trip unit in bypass as an option to restoring an AFAS instrument channel to OPERABLE status within 48 hours. ITS 3.3.3 ACTION B does not include the procedural details on which trip units to place in bypass (i.e., AFAS-1 or AFAS-2) based on the inoperable AFAS function. This changes the CTS by moving the procedural detail on what AFAS channels to bypass to the Bases.

The removal of these details, which are related to details on how to perform a Technical Specification Required Action, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to bypass the affected trip unit when a AFAS Function instrument channel is inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to how to perform an action is being removed from the Technical Specifications.

LA04 **Unit 2 only:** (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements*) CTS Table 3.3-3, Actions 13, 14.b, and 20.b state, in part, that all functional units receiving an input from the inoperable channel are also bypassed or tripped. CTS Table 3.3-3, Actions 13 and 14.b provide a process instrument and Function bypass list that identifies the associated Functions that must be bypassed if the instrument becomes inoperable, and Action 20.b references the Action 13 list. ITS 3.3.3 ACTIONS for each Function include a Required Action to place the affected trip unit in trip or bypass within 1 hour. CTS LCO 3.0.2 and ITS LCO 3.0.2 establish that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. Therefore, when an instrument channel becomes inoperable, LCO 3.0.2 requires each Function affected by the inoperability shall be declared inoperable and the associated ACTIONS shall be met. The CTS process instrument and Function bypass list is not necessary in the Specifications. This information is removed from the Technical Specifications and moved to the UFSAR.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that all functional units receiving an input from an inoperable channel are bypassed or tripped. ITS 3.3.3 ACTIONS for each Function include a Required Action to place the affected trip unit in trip or bypass within 1 hour. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. The UFSAR is controlled under 10 CFR 50.59 which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 2 – Relaxation of Applicability)* Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 require the MSIS Steam Generator Pressure – Low Function (Table 3.3-3 Functional Unit 4.b) to be OPERABLE in MODES 1, 2, and 3 except when bypassed as noted by Note (c). Unit 2 CTS 3.3.2 also requires the MSIS Containment Pressure – High channel to be OPERABLE in MODES 1, 2, and 3. ITS 3.3.3 also requires the same MSIS Function to be OPERABLE. However, Table 3.3.3-1, Function 4.a (MSIS Steam Generator Pressure – Low) modifies MODES 2 and 3 by Footnote (f) that states that the Main Steam Isolation Signal (MSIS) Function Steam Generator Pressure - Low signal is not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed. Unit 2 Table 3.3.3-1, Functions 4.a (MSIS Steam Generator Pressure – Low) and 4.b (MSIS Containment Pressure – High) modifies MODES 2 and 3 by Footnote (f) that states that the Main Steam Isolation Signal (MSIS) Function Steam Generator Pressure - Low and Containment Pressure - High signals are not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed. This changes the CTS by relaxing the MODE 2 and 3 requirements of the MSIS Steam Generator Pressure – Low instrument Function and the Unit 2 MSIS Containment Pressure - High instrument Function.

The purpose of the Applicability of the MSIS Steam Generator Pressure – Low and Unit 2 MSIS Containment Pressure - High instrument Functions is to ensure the ESFAS MSIS Functions are OPERABLE when the supported equipment (i.e., main steam isolation valves (MSIVs) and main feedwater isolation valves (MFIVs)) is required to be OPERABLE. Automatic steam line and feedwater line isolation is assumed in the mitigation of a major secondary system pipe rupture accident (e.g., main steam line break or feedwater line break). In MODES 1, 2, and 3, there is sufficient energy in the primary and secondary systems to warrant automatic ESF System response to ensure the main steam and feedwater lines can be isolated in the event of a high energy secondary system pipe rupture. The exception to MODE 2 and 3 is added to clarify that the MSIS Functions are not required to be OPERABLE when the valves actuated by the MSIS instrumentation are in a position that supports the safety analyses. When the valves isolated by the MSIS Functions are in the closed position, they are in their assumed accident position. This change is acceptable, because when the

MSIVs and MFIVs are closed, the adverse effects of a high energy secondary system pipe rupture are precluded and the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses. The proposed applicability change provides the same level of protection as the current requirements for the supported equipment and is consistent with the applicability for Function 4.a in ISTS Table 3.3.4-1 (Analog) and Function 4.b in ISTS Table 3.3.5-1 (Digital). This change is designated as less restrictive because the ITS LCO requirements are applicable in fewer operating conditions than in the CTS.

L02 (*Category 4 – Relaxation of Required Action*) Unit 1 CTS Table 3.3-3 Actions 9.c and 13, which apply to the SIAS, CIS and MSIS Functions and the RAS Function, respectively, require the minimum number of channels to be OPERABLE (i.e., three of four channels) except an additional channel may be bypassed for up to 48 hours (Action 9) or 2 hours (Action 13) while performing tests and maintenance on that channel provided the other inoperable channel is placed in the trip condition. Unit 2 CTS Table 3.3-3 Action 19, which applies to the RAS Function, requires the minimum number of channels to be OPERABLE (i.e., three of four channels) except an additional channel may be bypassed for up to 2 hours while performing testing per Specification 4.3.2.1. ITS 3.3.3 ACTION F provides the same condition (i.e., two of four channels inoperable) for the SIAS, CIS (Unit 1), CIAS (Unit 2), MSIS, and RAS Functions. When one or more Functions (except CSAS or AFAS) with two ESFAS trip units or associated instrument channels are inoperable, one trip unit must be placed in bypass and the other trip unit must be placed in trip within 1 hour and one trip unit must be restored to OPERABLE status within 48 hours. This changes the CTS by allowing two ESFAS Function trip units or associated instrument channels to be inoperable for reasons other than maintenance and testing and extends the time to restore the Unit 2 RAS ESFAS Function to OPERABLE status from 2 hours to 48 hours.

The purpose of the CTS Actions is to allow an additional ESFAS channel to be inoperable for the purposes of testing. The SIAS, CIS (Unit 1), CIAS (Unit 2), MSIS, and RAS ESFAS Function channels are configured in a two-out of-four coincidence. The two-out-of-four ESFAS logic is changed to a two-out-of-three logic for a given input parameter in one channel at a time by bypassing one channel input to the logic. With one channel of protective instrumentation bypassed, the ESFAS Function is in two-out-of-three logic, but with another channel failed the ESFAS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the ESFAS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, ESFAS actuation will occur. Therefore, it is also acceptable to allow an additional channel to be inoperable for reasons other than testing provided one channel is in bypass and the other channel is in trip. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the remaining ESFAS instrument channels, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. This change also provides appropriate remedial actions in lieu of requiring initiation of an unnecessary plant transient per ITS LCO 3.0.3 (CTS 3.0.3). The 48-hour Completion Time is based upon operating experience, which has demonstrated that a random failure of another channel occurring during the 48 hour period is a low probability event. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 (*Category 4 – Relaxation of Required Action*) Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 do not explicitly provide requirements associated with the bypass removal feature associated with the SIAS or MSIS ESFAS Functions. However, CTS 4.3.2.1.2 and Unit 2 CTS 4.3.2.2 require channel functional and calibration testing of the channel bypass logic, which includes the bypass removal feature. Therefore, per the requirements of CTS 4.0.1 (ITS SR 3.0.1), CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) encompass the ESFAS channel bypass removal feature. If an ESFAS bypass removal channel is inoperable, CTS 3.0.3 is entered since there is no Condition and Action specified in the CTS. ITS 3.3.3 also includes Surveillances for the channel bypass removal feature. In addition, ITS 3.3.3 ACTIONS G and H are added to provide remedial measures when the bypass removal capability is inoperable to an SIAS or MSIS ESFAS Function channel. ITS Required Actions G.1 and H.1 require disabling the inoperable bypass channel within 1 hour when one or two bypass removal channels is inoperable. When one bypass removal channel is inoperable, ITS 3.3.3 ACTION G alternately allows placing the affected channel in bypass or trip within 1 hour and restoring the channel to OPERABLE status within 48 hours. When two bypass removal channels are inoperable, ITS 3.3.3 ACTION H alternately allows placing one channel in trip and the other channel in bypass, and restoring one channel to OPERABLE status within 48 hours. This changes the CTS by adding specific Technical Specification actions when one or two bypass removal channels are inoperable to the SIAS or MSIS ESFAS Functions.

The purpose of the proposed actions is to provide appropriate remedial actions in the event the automatic bypass removal feature is inoperable. With one or two bypass removal channels inoperable, it is permissible to continue operation with the bypass permissive removal channels failed, providing the bypass is disabled. This can be accomplished by removing the bypass with the manual bypass key switch, which disables the bypass in its respective train. Since the bypass Function must be manually enabled, the bypass permissive Function will not by itself cause an undesired bypass insertion. Alternatively, the bypass may be disabled by defeating the bypass permissive input in one or two of the four channels to the two-out-of-four bypass removal logic, placing the bypass removal feature in one-out-of-three logic. Thus, any of the remaining channels is capable of removing the bypass feature when the bypass enable conditions are no longer valid. The Completion Times are consistent with the completion times for one or two inoperable SIAS or MSIS ESFAS Function channels. This change is also consistent with the ISTS.

This change is considered acceptable because the proposed remedial actions will ensure the related ESFAS Functions can continue to perform their related safety function when required by the plant design basis and safety analysis by requiring the bypass removal channel to be disabled or take action consistent with the current actions for an inoperable ESFAS channel. This change also provides appropriate remedial actions in lieu of requiring initiation of an unnecessary plant transient per ITS LCO 3.0.3 (CTS 3.0.3). This change is designated as less restrictive because the ITS ACTIONS provide remedial actions that are less restrictive than the CTS Action requiring a plant shutdown.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.3 INSTRUMENTATION ~~(Analog)~~ 3

3.3.4 Engineered Safety Features Actuation System (ESFAS) Instrumentation ~~(Analog)~~ 3

3

3.3.2.1 LCO 3.3.4 3 Four ESFAS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.4-1 shall be OPERABLE. 3 3 3

Table 3.3-3 Functional Unit 1.b, 1.c, 2.b, 3.b, 3.c, 4.a, 5.b, 7.c, 8.a, 8.b

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----

DOC A02 Separate Condition entry is allowed for each ESFAS Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-3 Action 10A A. ~~[~~One Containment Spray Actuation Signal (CSAS) trip unit or associated instrument inoperable. INSERT 1	A.1 Place affected trip unit in bypass. or trip AND A.2.1 Restore channel to OPERABLE status. OR A.2.2 Place affected trip unit in trip.	1 hour ~~]~~ 2 48 hours 48 hours 5
Table 3.3-3 Action 9 ~~B~~. D One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS , RAS or AFAS) inoperable.	~~B~~.1 D Place affected trip unit in bypass or trip. AND ~~B~~.2.1 D Restore channel to OPERABLE status. OR	1 hour 5 1 [48] hours 5 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2

1

INSERT 1

Table 3.3-3 Action 13	B. One Containment Sump Recirculation Actuation Signal (RAS) trip unit or associated instrument inoperable.	B.1 Place affected trip unit in bypass or trip. AND B.2 Restore trip unit to OPERABLE status.	1 hour 48 hours OR In accordance with the Risk Informed Completion Time Program
Table 3.3-3 Action 14.a, 14.b	C. ------------NOTE------------ Required Action C.2.2.2 must be completed whenever this Condition is entered. ------------------------------- One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) trip unit or associated instrument inoperable.	C.1 Place affected trip unit in bypass or trip. AND C.2.1 Restore channel to OPERABLE status. OR C.2.2.1 Place affected trip unit in bypass. AND C.2.2.2 Restore channel to OPERABLE status.	1 hour 48 hours 48 hours Prior to entering MODE 3 following next MODE 5 entry

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
INSERT 2	~~B~~ D.2.2 [Place affected trip unit in trip.	48 hours 5 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
Table 3.3-3 Action 9, 13 DOC L02 ~~C~~ F. One or more Functions with two ESFAS trip units or associated instrument channels (except CSAS or AFAS) inoperable.	~~C~~ F.1 Place one trip unit in bypass and place the other trip unit in trip. AND ~~C~~ F.2 Restore one trip unit to OPERABLE status.	1 hour 5 1 [48] hours 1 2
DOC M01 ~~D~~ G. One or more Functions with one automatic bypass removal channel inoperable. Safety Injection Actuation Signal (SIAS) or Main Steam Isolation Signal (MSIS)	~~D~~ G.1 Disable bypass channel. OR ~~D~~ G.2.1 Place affected trip units in bypass or trip. AND ~~D~~ G.2.2.1 Restore bypass removal channel and affected trip units to OPERABLE status. OR	1 hour 5 1 hour 5 [48] hours 5 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2

1

INSERT 2

Table 3.3-3
Action 10B
Action 15

E. One or more Functions with two or more AFAS trip units or associated instrument channels inoperable. OR Two CSAS trip units or associated instrument channels inoperable.	E.1 Place one trip unit in bypass and place the other trip unit in trip. AND E.2 Restore one trip unit to OPERABLE status.	1 hour 48 hours OR In accordance with the Risk Informed Completion Time Program

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~D~~ G.2.2.2 ~~[~~ Place affected trip units in trip.	48 hours 5 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
DOC M01 ~~E~~ H. One or more SIAS or MSIS Functions with two automatic bypass removal channels inoperable.	~~E~~ H.1 Disable bypass channels. OR ~~E~~ H.2.1 Place one affected trip unit in bypass and place the other in trip for each affected ESFAS Function. AND ~~E~~ H.2.2 ~~[~~ Restore one bypass channel and the associated trip unit to OPERABLE status for each affected trip Function.	1 hour 5 1 hour 3 48 hours 5 ~~[OR~~ 2 ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
Action 10B, 13, 15 ~~F~~ I. Required Action and associated Completion Time not met.	~~F~~ I.1 Be in MODE 3. AND ~~F~~ I.2 Be in MODE 4.	6 hours 5 ~~[~~12~~]~~ hours 5 2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.3.2.1.1	SR 3.3.4.1 3	Perform a CHANNEL CHECK of each ESFAS instrument channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2
4.3.2.1.1	SR 3.3.4.2 3	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS instrument channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
4.3.2.1.2	SR 3.3.4.3 3	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	~~Once within 92 days prior to each reactor startup~~ In accordance with the Surveillance Frequency Control Program	1
4.3.2.1.1	SR 3.3.4.4 3	Perform a CHANNEL CALIBRATION of each ESFAS instrument channel, including bypass removal functions.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
4.3.2.1.3 SR 3.3.4.5 3	Verify ESF RESPONSE TIME is within limits.	~~[[18] months on a STAGGERED TEST BASIS~~ 3 2 ~~OR~~ 2 In accordance with the Surveillance Frequency Control Program ~~]~~ 2

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Table 3.3.4-1 (page 1 of 2) 3
Engineered Safety Features Actuation System Instrumentation

	FUNCTION	MODES	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
	1. Safety Injection Actuation Signal (SIAS)		3		3
Table 3.3-3 Function 1.b	a. Containment Pressure - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0] psia~~ 5 psig	2
Table 3.3-3 Function 1.c	b. Pressurizer Pressure - Low(c)	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.3 SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[1687]~~ 1600 psia	2
	2. Containment Spray Actuation Signal(d)				
Table 3.3-3 Function 2.b	a. Containment Pressure - ~~High~~ High-High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0] psia~~ 10 psig	2
	3. Containment Isolation ~~Actuation~~ Signal				
Table 3.3-3 Function 3.b	a. Containment Pressure - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0]~~ 5 psig psia	2
Table 3.3-3 Function 3.c	[b. Containment Radiation - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[2x Background]~~] 10 R/hr	2

DOC M01 (a) If the as-found channel setpoint is outside its predefined ~~as-found tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

DOC M02 (b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~LTSP~~ NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~LTSP~~ NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures (~~Nominal Trip Setpoint~~) to confirm channel performance. The ~~LTSP~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.3 of the Updated Final Safety Analysis Report, respectively. 4

Table 3.3-3 Note (a) (c) Pressurizer Pressure - Low may be manually bypassed when pressurizer pressure is < ~~[1800]~~ 1725 psia. The bypass shall be automatically removed whenever pressurizer pressure is ≥ ~~[1800]~~ 1725 psia. 2

Table 3.3-3 Note (b) [(d) SIAS is also required as a permissive to initiate containment spray.] 2

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3

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Table 3.3.4-1 (page 2 of 2)
Engineered Safety Features Actuation System Instrumentation

	FUNCTION	MODES	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
	4. Main Steam Isolation Signal		3	585 psig	3
Table 3.3-3 Function 4.b	a. Steam Generator Pressure - Low(e)	1,2(f),3(f)	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.3 SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[495] psig~~	2
	5. Recirculation Actuation Signal			48	
Table 3.3-3 Function 5.b	a. Refueling Water Tank Level - Low	1,2,3	[SR 3.3.4.1] SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	~~[~~≥ 24 inches ~~and ≤ 30] inches~~ above tank bottom	2
	6. Auxiliary Feedwater Actuation Signal (AFAS)				
Table 3.3-3 Function 7.c	a. Steam Generator A Level - Low	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[45.7]~~ % 18	2
Table 3.3-3 Function 7.c	b. Steam Generator B Level - Low	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[45.7]~~ % 18	2
Table 3.3-3 Function 8.a	c. Steam Generator Pressure Difference - High (A > B) or (B > A)	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	~~≤ [48.3]~~ psid ≥ 89.2 and ≤ 281	2
Table 3.3-3 Function 8.b	d. Feedwater Header Pressure Difference – High	1, 2, 3	SR 3.3.3.1, SR 3.3.3.2 SR3.3.3.4, SR 3.3.3.5	≥ 56.0 and ≤ 157.5 psid	1

DOC M01 (a) If the as-found channel setpoint is outside its predefined ~~as-found tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

DOC M02 (b) The instrument NTSP channel setpoint shall NTSP be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~LTSP~~) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~LTSP~~ are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~LTSP~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.3 of the Updated Final Safety Analysis Report, respectively. 4

Table 3.3-3 Note (c) (e) Steam Generator Pressure - Low may be manually bypassed when steam generator pressure is < ~~[785] psia~~ 685 psig. The bypass shall be automatically removed whenever steam generator pressure is ≥ ~~[785] psia~~ 685 psig. 2

DOC L02 (f) ~~Only the~~ Main Steam Isolation Signal (MSIS) Function ~~and the~~ Steam Generator Pressure - Low ~~and Containment Pressure - High~~ signal~~s are~~ is not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed ~~and [de-activated]~~. 1 2

3 1

3.3 INSTRUMENTATION ~~(Analog)~~ 3

3.3.4 Engineered Safety Features Actuation System (ESFAS) Instrumentation ~~(Analog)~~ 3

3.3.2 LCO 3.3.4 Four ESFAS trip units and associated instrument and bypass removal channels for each Function in Table 3.3.4-1 shall be OPERABLE. 3 3

Table 3.3-3 Functional Unit 1.b, 1.c, 2.b, 3.b, 3.c, 3.d, 4.b, 4.c, 5.b, 7.c, 8.a, 8.b

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----

DOC A02 Separate Condition entry is allowed for each ESFAS Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-3 Action 18A A. ~~[~~ One Containment Spray Actuation Signal (CSAS) trip unit or associated instrument inoperable. INSERT 1	A.1 Place affected trip unit in bypass or trip. AND A.2.1 Restore channel to OPERABLE status. OR A.2.2 Place affected trip unit in trip.	1 hour ~~]~~ 2 48 hours 48 hours 5 6
Table 3.3-3 Action 13 ~~B~~ D. One or more Functions with one ESFAS trip unit or associated instrument channel (except CSAS, RAS or AFAS) inoperable. -----NOTE----- Required Action D.2 must be completed whenever this Condition is entered. ----------	~~B~~ D.1 Place affected trip unit in bypass or trip. AND ~~B~~ D.2.~~1~~ Restore channel to OPERABLE status. ~~OR~~	1 hour 5 1 ~~[48] hours~~ Prior to entering MODE 3 following next MODE 5 entry 5 2 ~~[OR~~ 5 6 ~~In accordance with the Risk Informed Completion Time Program]~~ 2

1

INSERT 1

Table 3.3-3 Action 19	B. One Containment Sump Recirculation Actuation Signal (RAS) trip unit or associated instrument inoperable.	B.1 Place affected trip unit in bypass or trip. AND B.2 Restore trip unit to OPERABLE status.	1 hour 48 hours OR In accordance with the Risk Informed Completion Time Program
Table 3.3-3 Action 20.a 20.b	C. ------------NOTE------------ Required Action C.2.2.2 must be completed whenever this Condition is entered. ------------------------------- One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) trip unit or associated instrument inoperable.	C.1 Place affected trip unit in bypass or trip. AND C.2.1 Restore channel to OPERABLE status. OR C.2.2.1 Place affected trip unit in bypass. AND C.2.2.2 Restore channel to OPERABLE status.	1 hour 48 hours 48 hours Prior to entering MODE 3 following next MODE 5 entry

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
INSERT 2	~~B.2.2~~ ~~[Place affected trip unit in trip.~~	~~48 hours~~ ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~
Table 3.3-3 Action 14, 19 DOC L02 ~~C~~ F. One or more Functions with two ESFAS trip units or associated instrument channels (except CSAS or AFAS) inoperable.	~~C~~ F.1 Place one trip unit in bypass and place the other trip unit in trip. AND ~~C~~ F.2 Restore one trip unit to OPERABLE status.	1 hour ~~[~~48~~]~~ hours
DOC M01 ~~D~~ G. One or more Functions with one automatic Safety Injection Actuation Signal (SIAS) or Main Steam Isolation Signal (MSIS) bypass removal channel inoperable.	~~D~~ G.1 Disable bypass channel. OR ~~D~~ G.2.1 Place affected trip units in bypass or trip. AND ~~D~~ G.2.2.1 Restore bypass removal channel and affected trip units to OPERABLE status. OR	1 hour 1 hour ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~

5 2 2 5 1 1 2 5 5 5 2 2

1

INSERT 2

Table 3.3-3 Action 18B Action 21	E. One or more Functions with two or more AFAS trip units or associated instrument channels inoperable. OR Two CSAS trip units or associated instrument channels inoperable.	E.1 Place one trip unit in bypass and place the other trip unit in trip. AND E.2 Restore one trip unit to OPERABLE status.	1 hour 48 hours OR In accordance with the Risk Informed Completion Time Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~D~~ G.2.2.2 [Place affected trip units in trip.	48 hours 5 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
DOC M01 ~~E~~ H. One or more SIAS or MSIS Functions with two automatic bypass removal channels inoperable.	~~E~~ H.1 Disable bypass channels. OR ~~E~~ H.2.1 Place one affected trip unit in bypass and place the other in trip for each affected ESFAS Function. AND ~~E~~ H.2.2 [Restore one bypass channel and the associated trip unit to OPERABLE status for each affected trip Function.	1 hour 5 1 hour 5 48 hours 5 ~~[OR~~ 2 ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
Action 18B, 19, 21 ~~F~~ I. Required Action and associated Completion Time not met.	~~F~~ I.1 Be in MODE 3. AND ~~F~~ I.2 Be in MODE 4.	6 hours 5 [12] hours 5 2

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.3.2.1	SR 3.3.4.1 3	Perform a CHANNEL CHECK of each ESFAS instrument channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2
4.3.2.1	SR 3.3.4.2 3	Perform a CHANNEL FUNCTIONAL TEST of each ESFAS instrument channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
4.3.2.2	SR 3.3.4.3 3	Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.	In accordance with the Surveillance Frequency Control Program ~~Once within 92 days prior to each reactor startup~~	1
4.3.2.1	SR 3.3.4.4 3	Perform a CHANNEL CALIBRATION of each ESFAS instrument channel, including bypass removal functions.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
4.3.2.3 SR 3.3.4.5 3	Verify ESF RESPONSE TIME is within limits.	~~[[18] months on a STAGGERED TEST BASIS~~ 3 2 ~~OR~~ 2 In accordance with the Surveillance Frequency Control Program ~~]~~ 2

3

Table 3.3.4-1 (page 1 of 2)
Engineered Safety Features Actuation System Instrumentation 3

CTS	FUNCTION	MODES	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
	1. Safety Injection Actuation Signal (SIAS)		3		3
Table 3.3-3 Function 1.b	a. Containment Pressure - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0] psia~~ 3.6 psig	2
Table 3.3-3 Function 1.c	b. Pressurizer Pressure - Low(c)	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.3 SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[1687]~~ 1728 psia	2
	2. Containment Spray Actuation Signal(d)				
Table 3.3-3 Function 2.b	a. Containment Pressure - ~~High~~ High-High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0] psia~~ 5.5 psig	2
	3. Containment Isolation Actuation Signal				
Table 3.3-3 Function 3.c	a. Containment Pressure - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[19.0]~~ 3.6 psig ~~psia~~	2
Table 3.3-3 Function 3.d	~~[~~ b. Containment Radiation - High	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≤ ~~[2x Background]]~~ 10 R/hr	2

DOC M01 (a) If the as-found channel setpoint is outside its predefined ~~as-found tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

DOC M02 (b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~LTSP~~ NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~LTSP~~ NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures (~~Nominal Trip Setpoint~~) to confirm channel performance. The ~~LTSP~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.3 of the Updated Final Safety Analysis Report, respectively. 4

Table 3.3-3 Note (a) (c) Pressurizer Pressure - Low may be manually bypassed when pressurizer pressure is < ~~[1800]~~ 1836 psia. The bypass shall be automatically removed whenever pressurizer pressure is ≥ ~~[1800]~~ 1836 psia. 2

Table 3.3-3 Note (b) ~~[~~ (d) SIAS is also required as a permissive to initiate containment spray. ~~]~~ 2

3

Table 3.3.4-1 (page 2 of 2)
Engineered Safety Features Actuation System Instrumentation

	FUNCTION	MODES	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	
			3	567 psia	3
	4. Main Steam Isolation Signal				
Table 3.3-3 Function 4.b	a. Steam Generator Pressure - Low(e)	1,2(f),3(f)	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.3 SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[495] psig~~	2
Function 4.c	b. Containment Pressure - High	1,2(f),3(f)	SR 3.3.3.1, SR 3.3.3.2, SR 3.3.3.4, SR 3.3.3.5	≤ 3.6 psig	
	5. Recirculation Actuation Signal				
Table 3.3-3 Function 5.b	a. Refueling Water Tank Level - Low	1,2,3	[SR 3.3.4.1] SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	~~[≥ 24 inches and ≤ 30] inches~~ above tank bottom ≥ 4.62 feet and ≤ 6.24 feet	2
	6. Auxiliary Feedwater Actuation Signal (AFAS)				
Table 3.3-3 Function 7.c	a. Steam Generator A Level - Low	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[45.7]~~ 18 %	2
Table 3.3-3 Function 7.c	b. Steam Generator B Level - Low	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	≥ ~~[45.7]~~ 18 %	2
Table 3.3-3 Function 8.a	c. Steam Generator Pressure Difference - High (A > B) or (B > A)	1,2,3	SR 3.3.4.1 SR 3.3.4.2(a)(b) SR 3.3.4.4(a)(b) SR 3.3.4.5	~~≤ [48.3]~~ psid ≥ 89.2 and ≤ 281	2
Table 3.3-3 Function 8.b	d. Feedwater Header Pressure Difference – High	1, 2, 3	SR 3.3.3.1, SR 3.3.3.2 SR3.3.3.4, SR 3.3.3.5	≥ 56.0 and ≤ 157.5 psid	1

DOC M01 (a) If the as-found channel setpoint is outside its predefined ~~as-found tolerance~~ acceptance criteria band, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. 4

DOC M02 (b) The instrument channel setpoint shall be reset to a value that is within the as-left ~~tolerance~~ acceptance criteria band around the ~~Limiting~~ Nominal Trip Setpoint (~~LTSP~~ NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the ~~LTSP~~ NTSP are acceptable provided that the as-found and as-left ~~tolerances~~ acceptance criteria bands apply to the actual setpoint implemented in the Surveillance procedures ~~(Nominal Trip Setpoint)~~ to confirm channel performance. The ~~LTSP~~ NTSP and the methodologies used to determine the as-found and as-left ~~tolerances~~ acceptance criteria bands are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.3 of the Updated Final Safety Analysis Report, respectively. 4

Table 3.3-3 Note (c) (e) Steam Generator Pressure - Low may be manually bypassed when steam generator pressure is < ~~[785] psia~~ 700 psia. The bypass shall be automatically removed whenever steam generator pressure is ≥ ~~[785] psia~~ 700 psia. 2

DOC L02 (f) ~~Only the~~ Main Steam Isolation Signal (MSIS) Function ~~and the~~ Steam Generator Pressure - Low and Containment Pressure - High signals are not required to be OPERABLE when all associated valves isolated by the MSIS Function are closed ~~and [de-activated]~~. 1 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.4 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

4. PSL does not use the terms “as-found tolerance” and “Limiting Trip Setpoint (LTSP)” in plant specific instrument calculations or the Updated Final Safety Analysis Report. Therefore, the use of these terms in Footnotes (a) and (b) in ISTS Table 3.3.1-1 are revised in the ITS to include the plant specific terminology. To comply with the guidance provided in NRC Regulatory Issue Summary 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” the PSL setpoint calculations have been structured to include a Nominal Trip Setpoint (NTSP), also known as the field trip setpoint, and determination of an OPERABILITY limit range, referred to in CTS as acceptance criteria band. For PSL, the Nominal Trip Setpoint (NTSP) is synonymous with the Limiting Trip Setpoint (LTSP) and the as-found acceptance criteria band (i.e., OPERABILITY limit range) is synonymous with the as-found tolerance.

5. Condition B is added to ITS 3.3.3 (ISTS 3.3.4) to provide specific actions for one inoperable Containment Sump Recirculation Actuation Signal (RAS) trip unit or associated instrument. In addition, Condition C is also added to provide specific actions for one or more inoperable Auxiliary Feedwater Actuation Signal (AFAS) trip unit or associated instrument. A Note is added to proposed ITS 3.3.3 Condition C (Insert 1 to ISTS 3.3.4) stating that Required Action C.2.2.2 shall be completed when Condition C is entered. This Note constitutes an “unless otherwise stated” exception to LCO 3.0.2 to require the action to be completed within the associated Completion Time even when the LCO is no longer applicable. The added Note is similar to other Notes in the ISTS (e.g., Note to Condition A of ISTS 3.2.3 and the Note to Conditions A and C of ISTS 3.4.3.). These additional ITS ACTIONS are consistent with the PSL current licensing basis and consider the differing actions related to RAS, AFAS, and the remaining ESFAS functions based on whether instruments must be restored in 48 hours, may be optionally restored in accordance with the Risk Informed Completion Time Program, or channel restoration is extended to prior to entering MODE 3 following the next MODE 5 entry. Subsequent Conditions and Required Actions have been renumerated, as applicable, and Condition exceptions revised to reflect the additional ITS ACTIONS.

6. **Unit 2 only:** ISTS 3.3.4, Required Action B.2.2 is deleted and the Completion Time of Required Action B.2.1 (ITS 3.3.3, Required Action D.2) is modified in the Unit 2 ITS consistent with the PSL current licensing basis to allow the channel to be in trip or bypass until the next plant startup following entry into MODE 5 and similar to ISTS 3.3.5 (Digital), Required Action A.2. The Unit 2 ESFAS design includes independence of the four protection channels to ensure no single failure (e.g., circuit fault) can adversely affect more than one channel. As discussed in Section 7.2.4 of NUREG-0843, "Safety Evaluation Report – St. Lucie Unit 2," the NRC concluded that the ESFAS design enhancements were sufficient to ensure the independence of the four protection channels. Thus, the Unit 2 Technical Specifications allow a failed channel to be placed in long term trip or bypass condition provided the channel is restored no later than the next cold shutdown following the channel malfunction. A Note is added to ITS 3.3.3 Condition D (ISTS 3.3.4, Condition B) stating that Required Action D.2 shall be completed when Condition D is entered. This Note constitutes an "unless otherwise stated" exception to LCO 3.0.2 to require the action to be completed within the associated Completion Time even when the LCO is no longer applicable. The added Note is similar to other Notes in the ISTS (e.g., Note to Condition A of ISTS 3.2.3 and the Note to Conditions A and C of ISTS 3.4.3.).

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

3

B 3.3 INSTRUMENTATION ~~(Analog)~~

3

B 3.3.4 Engineered Safety Features Actuation System (ESFAS) Instrumentation ~~(Analog)~~

3

3

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based upon the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary and to mitigate accidents. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the ESFAS, as well as LCOs on other reactor system parameters and equipment performance.

Technical Specifications are required by 10 CFR 50.36 to include LSSSs for variables that have significant safety functions. LSSS are defined by the regulation as "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a safety action is initiated, as established by the safety analysis, to ensure that a SL is not exceeded. Any automatic protection action that occurs on reaching the Analytical Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protection channels must be chosen to be more conservative than the Analytical Limit to account for instrument loop uncertainties related to the setting at which the automatic protective action would actually occur.

~~------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The term "Limiting Trip Setpoint" [LTSP] is generic terminology for the calculated trip setting (setpoint) value calculated by means of the plant specific setpoint methodology documented in a document controlled under 10 CFR 50.59. The term [LTSP] indicates that no additional margin has been added between the Analytical Limit and the calculated trip setting.~~ 4

~~"Nominal Trip Setpoint [NTSP]" is the suggested terminology for the actual setpoint implemented in the plant surveillance procedures where margin has been added to the calculated [LTSP]. The as-found and as-left tolerances will apply to the [NTSP] implemented in the Surveillance procedures to confirm channel performance.~~ 4

BASES

BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note b of Table 3.3.4-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ 4

~~Where the [LTSP] is not included in Table 3.3.4-1, the plant specific location for the [LTSP] or [NTSP] much be cited in Note b of Table 3.3.4-1. The brackets indicate plant specific terms may apply, as required and approved by the NRC.~~ 4

~~---~~

1

The ~~[Limiting~~ Nominal Trip Setpoint (~~LTSP)]~~ NTSP) specified in ~~Table 3.3.4-1~~ Technical Requirements Manual (Ref. 1) is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[LTSP]~~ NTSP accounts for uncertainties in setting the channel (e.g., calibration), uncertainties in how the channel might actually perform (e.g., repeatability), changes in the point of action of the channel over time (e.g., drift during surveillance intervals), and any other factors which may influence its actual performance (e.g., harsh accident environments). In this manner, the ~~[LTSP]~~ NTSP ensures that SLs are not exceeded. As such, the ~~[LTSP]~~ NTSP meets the definition of an LSSS (Ref. ~~1~~ 2).

2

Technical Specifications contain values related to the OPERABILITY of equipment required for safe operation of the facility. OPERABLE is defined in Technical Specifications as "...being capable of performing its safety function(s)." Relying solely on the ~~[LTSP]~~ NTSP to define OPERABILITY in Technical Specifications would be an overly restrictive requirement if it were applied as an OPERABILITY limit for the "as-found" value of a protection channel setting during a Surveillance. This would result in Technical Specification compliance problems, as well as reports and corrective actions required by the rule which are not necessary to ensure safety. For example, an automatic protection channel with a setting that has been found to be different from the ~~[LTSP]~~ NTSP due to some drift of the setting may still be OPERABLE because drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the ~~[LTSP]~~ NTSP and thus the automatic protective action would still have ensured that the SL would not be exceeded with the "as-found" setting of the protection channel. Therefore, the channel would still be OPERABLE because it would have performed its safety function and the only corrective action required would be to reset the channel within the established as-left ~~tolerance~~ acceptance criteria band around the ~~[LTSP]~~ NTSP to account for further drift during the next surveillance interval. Note that, 1

BASES

BACKGROUND (continued)

although the channel is OPERABLE under these circumstances, the trip setpoint must be left adjusted to a value within the as-left ~~tolerance~~ acceptance criteria band, in accordance with uncertainty assumptions stated in the referenced setpoint methodology (as-left criteria), and confirmed to be operating within the statistical allowances of the uncertainty terms assigned (as-found criteria).

However, there is also some point beyond which the channel may not be able to perform its function due to, for example, greater than expected drift. This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value.

If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found ~~tolerance~~ acceptance criteria band, the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[Normal Trip Setpoint (~~NTSP~~)]~~ (within the allowed ~~tolerance~~ acceptance criteria band), and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance. After the surveillance is completed, the channel as-found condition will be entered into the Corrective Action Program for further evaluation.

During anticipated operational occurrences (AOOs), which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio (DNBR) shall be maintained above the SL value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System (RCS) pressure SL of ~~[~~2750~~]~~ psia shall not be exceeded.

Maintaining the parameters within the above values ensures that the offsite dose will be within the 10 CFR 50 (Ref. ~~2~~ 3) and 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) criteria during AOOs.

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) limits. Different accident categories allow

BASES

BACKGROUND (continued)

a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event.

The ESFAS contains devices and circuitry that generate the following signals when the monitored variables reach levels that are indicative of conditions requiring protective action:

1. Safety Injection Actuation Signal (SIAS),
2. Containment Spray Actuation Signal (CSAS),
3. Containment Isolation Signal (CI~~A~~S),
4. Main Steam Isolation Signal (MSIS),
5. Recirculation Actuation Signal (RAS), and
6. Auxiliary Feedwater Actuation Signal (AFAS).

Equipment actuated by each of the above signals is identified in the U FSAR (Ref. ~~4~~ 5).

Each of the above ESFAS actuation systems is segmented into four sensor subsystems and two actuation subsystems. Each sensor subsystem includes measurement channels and bistables. ~~The actuation subsystems include two logic subsystems for sequentially loading the diesel generators.~~

Each of the four sensor subsystem channels monitors redundant and independent process measurement channels. Each sensor is monitored by at least one bistable. The bistable associated with each ESFAS Function will trip when the monitored variable exceeds the ~~[LTSP]~~ NTSP. When tripped, the sensor subsystems provide outputs to the two actuation subsystems.

The two independent actuation subsystems compare the four sensor subsystem outputs. If a trip occurs in the same parameter in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem will initiate one train of ESFAS. Each train can provide protection to the public in the case of a Design Basis Event. Actuation Logic is addressed in LCO 3.3.~~5~~ 4, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip~~ Actuation."

Each of the four sensor subsystems is mounted in a separate cabinet, excluding the sensors and field wiring.

BASES

BACKGROUND (continued)

The role of the sensor subsystem (measurement channels and bistables) is discussed below; actuation subsystems are discussed in LCO 3.3.~~5~~ 4.

Measurement Channels

Measurement channels, consisting of field transmitters or process sensors and associated instrumentation, provide a measurable electronic signal based upon the physical characteristics of the parameter being measured.

Four identical measurement channels with electrical and physical separation are provided for each parameter used in the generation of trip signals. These are designated Channels A through D. Measurement channels provide input to ESFAS bistables within the same ESFAS channel. ~~In addition, some measurement channels may also be used as inputs to Reactor Protective System (RPS) bistables, and most provide indication in the control room.~~ Measurement channels used as an input to ~~the RPS or~~ ESFAS are not used for control Functions.

When a channel monitoring a parameter indicates an unsafe condition, the bistable monitoring the parameter in that channel will trip. Tripping two or more channels of bistables monitoring the same parameter will de-energize both channels of Actuation Logic of the associated Engineered Safety Features (ESF) equipment.

Three of the four measurement and bistable channels are necessary to meet the redundancy and testability of GDC 21 in Appendix A to 10 CFR 50 (Ref. 2). The fourth channel provides additional flexibility by allowing one channel to be removed from service (trip channel bypass) for maintenance or testing while still maintaining a minimum two-out-of-three logic. The single failure criterion is met during this condition.

~~In order to take full advantage of the four channel design, adequate channel to channel independence must be demonstrated, and approved by the NRC staff. Plants not currently licensed to credit four channel independence that may desire this capability must have approval of the NRC staff documented by an NRC Safety Evaluation Report (Ref. 5). Adequate channel to channel independence includes physical and electrical independence of each channel from the others. Furthermore, each channel must be energized from separate inverters and station batteries. Plants not demonstrating four channel independence may operate in a two-out-of-three logic configuration for 48 hours.~~

Since no single failure will either cause or prevent a protective system actuation and no protective channel feeds a control channel, this arrangement meets the requirements of IEEE Standard ~~79~~ 279-1971 (Ref. 6).

BASES

BACKGROUND (continued)

Bistable Trip Units

Bistable trip units receive an analog input from the measurement channels, compare the analog input to trip setpoints, and provide contact output to the Actuation Logic. They also provide local trip indication and remote annunciation.

There are four channels of bistables, designated A through D, for each ESF Function, one for each measurement channel. ~~In cases where two ESF Functions share the same input and trip setpoint (e.g., containment pressure input to CSAS, CIAS, and SIAS and a Pressurizer Pressure - Low input to the RPS and SIAS), the same bistable may be used to satisfy both Functions.~~ 1

The trip setpoints and Allowable Values used in the bistables are based on the analytical limits stated in Reference 7. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment effects, for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 8), Allowable Values specified in Table 3.3.~~4~~ 3-1, in the accompanying LCO, are conservatively adjusted with respect to the analytical limits. A detailed description of the method used to calculate the trip setpoints, including their explicit uncertainties, is provided in ~~the "Plant Protection System Selection of Trip Setpoint Values"~~ IC-3.17, "FPL Setpoint Standard" (Ref. 9). The actual trip setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the interval between surveillances. 3 1

The ~~[LTSP]~~ NTSP is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[LTSP]~~ NTSP value is the LSSS and ensures the safety analysis limits are met for the surveillance interval selected when a channel is adjusted based on stated channel uncertainties. 2

~~[LTSPs]~~ NTSP, in conjunction with the use of as-found and as-left ~~tolerances~~ acceptance criteria bands, consistent with the requirements of the Allowable Value will ensure that Safety Limits of Chapter 2.0, "SAFETY LIMITS (SLs)," are not violated during AOOs and that the consequences of Design Basis Accidents (DBAs) will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed. 2 1

BASES

BACKGROUND (continued)

Note that in the accompanying LCO 3.3.4, the Allowable Values of the Table 3.3.4-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION or CHANNEL FUNCTIONAL TEST. 3

ESFAS Logic

It is possible to change the two-out-of-four ESFAS logic to a two-out-of-three logic for a given input parameter in one channel at a time by bypassing ~~disabling~~ one channel input to the logic. Thus, the bistables will function normally, producing normal trip indication and annunciation~~, but ESFAS actuation will not occur since the bypassed channel is effectively removed from the coincidence logic. Trip channel bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. At some plants an interlock prevents simultaneous trip channel bypassing of the same parameter in more than one channel.~~ Trip channel bypassing is normally employed during maintenance or testing. 1 1

ESFAS Logic is addressed in LCO 3.3.~~5~~4. 3

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. Functions such as Manual Initiation, not specifically credited in the accident analysis, serve as backups to Functions and are part of the NRC approved licensing basis for the plant.

~~Permissive and interlock setpoints allow the blocking of trips during plant startups, and restoration of trips when the permissive conditions are not satisfied, but they are not explicitly modeled in the Safety Analyses. These permissives and interlocks ensure that the starting conditions are consistent with the safety analysis, before preventive or mitigating actions occur. Because these permissives or interlocks are only one of multiple conservative starting assumptions for the accident analysis, they are generally considered as nominal values without regard to measurement accuracy.~~ 1

ESFAS protective Functions are as follows:

BASES

APPLICABLE SAFETY ANALYSES (continued)

1. Safety Injection Actuation Signal

The SIAS ensures acceptable consequences during loss of coolant accident (LOCA) events, including steam generator tube rupture, and main steam line breaks (MSLBs) or feedwater line breaks (FWLBs) (inside containment). To provide the required protection, either a high containment pressure or a low pressurizer pressure signal will initiate SIAS. SIAS initiates the Emergency Core Cooling Systems (ECCS), control room isolation, and several other Functions, such as starting the emergency diesel generators.

2. Containment Spray Actuation Signal

The CSAS initiates containment spray, preventing containment overpressurization during a LOCA or MSLB. ~~At some plants,~~ both a high- high containment pressure signal and an SIAS have to actuate to provide the required protection. This configuration reduces the likelihood of inadvertent containment spray.

3. Containment Isolation Signal

The CIS actuates the Containment Isolation System, ensuring acceptable consequences during LOCAs and MSLBs or FWLBs (inside containment). To provide protection, a high containment pressure signal will initiate CIS at the same setpoint at which an SIAS is generated. A high containment radiation signal will also initiate CIS.

4. Main Steam Isolation Signal

The MSIS ensures acceptable consequences during an MSLB or FWLB by isolating both steam generators if either generator indicates a low steam generator pressure. The MSIS, concurrent with or following a reactor trip, minimizes the rate of heat extraction and subsequent cooldown of the RCS during these events.

5. Recirculation Actuation Signal

At the end of the injection phase of a LOCA, the refueling water tank (RWT) will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sump. Switchover from RWT to the containment sump must occur before the RWT empties to prevent damage to the ECCS pumps and

BASES

APPLICABLE SAFETY ANALYSES (continued)

a loss of core cooling capability. For similar reasons, switchover must not occur before there is sufficient water in the containment sump to support pump suction. Furthermore, early switchover must not occur to ensure sufficient borated water is injected from the RWT to ensure the reactor remains shut down in the recirculation mode. An RWT Level - Low signal initiates the RAS.

6. Auxiliary Feedwater Actuation Signal

An AFAS initiates feedwater flow to ~~both~~ the affected steam generator~~s~~ if a low level is indicated in ~~either~~ the affected steam generator, unless the generator is faulted ~~ruptured~~. 1

The AFAS maintains a steam generator heat sink during the following events:

- MSLB,
- FWLB,
- Inadvertent opening of a steam generator atmospheric dump valve, and
- Loss of feedwater.

A low steam generator water level signal will initiate auxiliary feed to the affected steam generator.

Secondary steam generator (SG) differential pressure (SG-A > SG-B) or (SG-B > SG-A), or feedwater header (FW) differential pressure (FW-A > FW-B) or (FW-B > FW-A), inhibits auxiliary feed to a generator identified as being faulted ~~ruptured~~. This input to the AFAS logic prevents loss of the intact generator while preventing feeding a ~~ruptured~~ faulted generator during MSLBs and FWLBs. This prevents containment overpressurization during these events. 1 1

The ESFAS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires all channel components necessary to provide an ESFAS actuation to be OPERABLE. Failure of any required portion of the instrument channel renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. The specific criteria for determining channel OPERABILITY differ slightly between Functions. These criteria are discussed on a Function by Function basis below.

BASES

LCO (continued)

Actions allow maintenance (trip channel) bypass of individual channels~~, but the bypass activates interlocks that prevent operation with a second channel in the same Function bypassed~~. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). ~~At plants where adequate channel to channel independence has been demonstrated, specific exceptions may be approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~

Allowable Values for ESFAS Instrumentation (Analog) Functions are specified in Table 3.3.~~4~~3-1. ~~[LTSPs]~~ NTSP and the methodologies for calculation of the as-left and as-found ~~tolerances~~ acceptance criteria bands are described in ~~[insert the name of a document controlled under 10 CFR 50.59 such as~~ the Technical Requirements Manual (Ref. 1) and Section 7.3 of the Updated Final Safety Analysis Report (Ref. 5). ~~or any document incorporated into the facility FSAR]~~. The ~~[LTSPs]~~ NTSPs are selected to ensure that the actual setpoints remain conservative with respect to the as-found ~~tolerance~~ acceptance criteria band between successive CHANNEL CALIBRATIONS. After each calibration the trip setpoint shall be left within the as-left band around the ~~[LTSP]~~ NTSP.

The Bases for the LCO on ESFAS Functions are:

1. <u>Safety Injection Actuation Signal</u>

   a. <u>Containment Pressure - High</u>

      This LCO requires four channels of SIAS Containment Pressure - High to be OPERABLE in MODES 1, 2, and 3.

      The Allowable Value for this trip is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

   b. <u>Pressurizer Pressure - Low</u>

      This LCO requires four channels of SIAS Pressurizer Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

BASES

LCO (continued)

The Allowable Value for this trip is set low enough to prevent actuating the SIAS during normal plant operation and pressurizer pressure transients. The setting is high enough that with a LOCA or MSLB it will actuate to perform as expected, mitigating the consequences of the accidents.

The Pressurizer Pressure - Low trip may be blocked when pressurizer pressure is reduced during controlled plant shutdowns. This block is permitted below 1725 ~~1800~~ psia, and block permissive responses are annunciated in the control room. This allows for a controlled depressurization of the RCS, while maintaining administrative control of ESF protection. From a blocked condition, the block will be automatically removed as pressurizer pressure increases above 1725 ~~1800~~ psia, as sensed by two of the four sensor subsystems~~, in accordance with the bypass philosophy of removing bypasses when the enabling conditions are no longer satisfied~~. 1 1

This LCO requires four channels of the bypass permissive removal for SIAS Pressurizer Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

The bypass permissive channels consist of four sensor subsystems and two actuation subsystems. This LCO applies to failures in the four sensor subsystems, including sensors, bistables, and associated equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~4. 3

This LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The block permissive is set low enough so as not to be enabled during normal plant operation, but high enough to allow blocking prior to reaching the trip setpoint.

2. <u>Containment Spray Actuation Signal</u>

CSAS is initiated either manually or automatically. ~~At many plants, i~~It is also necessary to have an automatic or manual SIAS for complete actuation. ~~The SIAS opens the containment spray valves, whereas the CSAS actuates other required components.~~ The SIAS requirement should always be satisfied on a legitimate CSAS, since 1 1

BASES

LCO (continued)

lower than the Containment Pressure – High-High signal

The parameters used for CSAS (Containment Pressure High-High and SIAS) give direct indication of a LOCA. The time to actuate CSAS depends on the break size. The Containment Pressure High-High set point is the controlling parameter since for all break sizes it takes longer to reach this set point than the SIAS set point.

the Containment Pressure - High signal setpoint used in the SIAS is ~~the same~~ setpoint used in the CSAS. ~~At many plants, the transmitters used to initiate CSAS are independent of those used in the SIAS to prevent inadvertent containment spray due to failures in two sensor channels.~~ 1

a. Containment Pressure - High -High 1

This LCO requires four channels of CSAS Containment Pressure - High -High to be OPERABLE in MODES 1, 2, and 3. 1

The Allowable Value is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

~~The Containment Pressure - High setpoint is the same in the SIAS (Function 1), CSAS (Function 2), and CIAS (Function 3). However, different sensors and logic are used in each of these Functions.~~ 1

3. Containment Isolation ~~Actuation~~ Signal 1

a. Containment Pressure - High

This LCO requires four channels of CI~~A~~S Containment Pressure - High to be OPERABLE in MODES 1, 2, and 3. 1

The Allowable Value is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

The Containment Pressure - High setpoint is the same in the SIAS (Function 1)~~, CSAS (Function 2),~~ and CI~~A~~S (Function 3). However, different ~~sensors and~~ logic ~~are~~ is used in each of these Functions. 1

3

BASES

LCO (continued)

b. Containment Radiation - High

This LCO requires four channels of CI~~A~~S Containment Radiation - High to be OPERABLE in MODES 1, 2, and 3. 1

The Allowable Value is high enough to avoid unnecessary actuation, but adequate to provide diverse actuation of the CI~~A~~S in the event of a LOCA. 1

4. Main Steam Isolation Signal

The MSIS is required to be OPERABLE in MODES 1, 2, and 3 except when all associated valves are closed and de-activated.

a. Steam Generator Pressure - Low

This LCO requires four channels of MSIS Steam Generator Pressure - Low for each steam generator to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value is set below the full load operating value for steam pressure so as not to interfere with normal plant operation. However, the setting is high enough to provide the required protection for excessive steam demand. An excessive steam demand causes the RCS to cool down, resulting in a positive reactivity addition to the core. An MSIS is required to prevent the excessive cooldown.

This Function may be manually blocked when steam generator pressure is reduced during controlled plant cooldowns. The block is permitted below ~~785~~ 685 psia, and block permissive responses are annunciated in the control room. This allows a controlled depressurization of the secondary system, while maintaining administrative control of ESF protection. From a blocked condition, the block will be removed automatically as steam generator pressure increases above ~~785~~ 685 psia, as sensed by two of the four sensor subsystems~~, in accordance with the bypass philosophy of removing bypasses when the enabling conditions are no longer satisfied~~. 1 1 1

This LCO requires four channels per steam generator of the bypass removal for MSIS Steam Generator Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

1

3

1

BASES

LCO (continued)

The bypass removal channels consist of four sensor subsystems and two actuation subsystems. This LCO applies to failures in the four sensor subsystems, including sensors, bistables, and associated equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~4. 3

This LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The block permissive is set low enough so as not to be enabled during normal plant operation, but high enough to allow blocking prior to reaching the trip setpoint.

5. <u>Recirculation Actuation Signal</u>

a. <u>Refueling Water Tank Level - Low</u>

This LCO requires four channels of RWT Level - Low to be OPERABLE in MODES 1, 2, and 3.

The upper limit on the Allowable Value for this trip is set low enough to ensure RAS does not initiate before sufficient water is transferred to the containment sump. Premature recirculation could impair the reactivity control Function of safety injection by limiting the amount of boron injection. Premature recirculation could also damage or disable the recirculation system if recirculation begins before the sump has enough water to prevent air ~~containment~~ entrainment in the suction. The lower limit on the RWT Level - Low trip Allowable Value is high enough to transfer suction to the containment sump prior to emptying the RWT. 1

6. <u>Auxiliary Feedwater Actuation Signal</u>

The AFAS logic actuates auxiliary feedwater (AFW) to a steam generator on low level in that generator unless it has been identified as being ~~ruptured~~ faulted.

A low level in ~~either~~ the faulted steam generator, as sensed by a two-out-of-four coincidence of four wide range sensors for ~~any~~ each steam generator, will generate an AFAS start signal, which starts ~~both~~ the affected train~~s~~ of AFW 1 1

BASES

LCO (continued)

the affected
, and the feedwater header differential pressure in both feedwater headers, 1

pumps and feeds ~~both~~ steam generator~~s~~. The AFAS also monitors 1
the secondary differential pressure in both steam generators and
initiates an AFAS block signal to a ~~ruptured~~ generator, if the pressure 1
in ~~that generator is lower than that in the other generator~~ by the
differential pressure setpoint.

faulted

one steam generator is lower than the other steam generator, or the pressure in one feedwater header is lower than the other feedwater header,

a. Steam Generator A/B Level - Low

This LCO requires four channels for each steam generator of Steam Generator Level - Low to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value ensures adequate time exists to initiate AFW while the steam generators can function as a heat sink.

b. Steam Generator Pressure Difference - High (SG-A > SG-B) or (SG-B > SG-A)

This LCO requires four channels per steam generator of Steam Generator Pressure Difference - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value for this trip is high enough to allow for small pressure differences and normal instrumentation errors between the steam generator channels during normal operation without an actuation. The setting is low enough to detect and inhibit feeding of a ~~ruptured~~ steam generator in the event of an MSLB 1
or FWLB, while permitting the feeding of the intact steam generator.

faulted

INSERT 1 1

The ESFAS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

APPLICABILITY All ESFAS Functions are required to be OPERABLE in MODES 1, 2, and 3. In MODES 1, 2, and 3 there is sufficient energy in the primary and secondary systems to warrant automatic ESF System responses to:

- Close the main steam isolation valves to preclude a positive reactivity addition,
- Actuate AFW to preclude the loss of the steam generators as a heat sink (in the event the normal feedwater system is not available),
- Actuate ESF systems to prevent or limit the release of fission product radioactivity to the environment by isolating containment and limiting the containment pressure from exceeding the containment design pressure during a design basis LOCA or MSLB, and

1

INSERT 1

b. Feedwater Header Pressure Difference - High
(FW-A > FW-B) or (FW-B > FW-A)

This LCO requires four channels per feedwater subsystem of Feedwater Header Pressure Difference - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value for this trip is high enough to allow for small pressure differences and normal instrumentation errors between the feedwater header channels during normal operation without an actuation. The setting is low enough to detect and inhibit feeding of a faulted steam generator in the event of an MSLB or FWLB, while permitting the feeding of the intact steam generator.

BASES

APPLICABILITY (continued)

- Actuate ESF systems to ensure sufficient borated inventory to permit adequate core cooling and reactivity control during a design basis LOCA or MSLB accident.

In MODES 4, 5, and 6, automatic actuation of ESFAS Functions is not required because adequate time is available for plant operators to evaluate plant conditions and respond by manually operating the ESF components, if required, as addressed by LCO 3.3.~~5~~ 4. In LCO 3.3.~~5~~ 4, manual capability is required for Functions other than AFAS in MODE 4, even though automatic actuation is not required. Because of the large number of components actuated on each ESFAS, actuation is simplified by the use of the Manual ~~Trip~~ Actuation push buttons. Manual ~~Trip~~ Actuation of AFAS is not required in MODE 4 because AFW or shutdown cooling will already be in operation in this MODE. 3 1

The ESFAS Actuation Logic must be OPERABLE in the same MODES as the automatic and Manual ~~Trip~~ actuation. In MODE 4, only the portion of the ESFAS logic responsible for the required Manual ~~Trip~~ Actuation must be OPERABLE. 1

In MODES 5 and 6, ESFAS initiated systems are either reconfigured or disabled for shutdown cooling operation. Accidents in these MODES are slow to develop and would be mitigated by manual operation of individual components.

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis.

Typically, the drift is small and results in a delay of actuation rather than a total loss of function. Determination of setpoint drift is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it to within specification. If the actual trip setpoint is nonconservative with respect to the Allowable Value in Table 3.3.4-1, the channel is inoperable and the appropriate Condition(s) are entered. 3 3

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value in Table 3.3.4-1, or the channel is not functioning as required, or the sensor, instrument loop, signal processing electronics, or ESFAS bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the plant must enter the Condition statement for the particular protection Function affected. 3 3

BASES

ACTIONS (continued)

When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

A Note has been added to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function in Table 3.3.~~4~~-1. Completion Times for the inoperable channel of a Function will be tracked separately. 3

3

INSERT A ~~[A.1~~ 2

INSERT B

INSERT C

~~Condition A applies to one CSAS Containment Pressure - High channel inoperable. CSAS logic is identical to that of the other ESFAS Functions; however, the inadvertent actuation of a CSAS is undesirable, since it may damage equipment inside containment. For this reason, placing the inoperable channel in trip is not an option as it is in Conditions B and C.]~~ 1

~~[For those plants in which the SIAS is required for a complete CSAS actuation, Condition B for one ESFAS channel inoperable and Condition C for two ESFAS channels inoperable may be preferable to Condition A.~~

~~If one CSAS channel is inoperable, operation is allowed to continue, providing the inoperable channel is placed in bypass within 1 hour. The Completion Time of 1 hour allotted to bypass the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.]~~

D D D

~~B~~.1, ~~B~~.2.1, and ~~B~~.2.2 3

D

Condition ~~B~~ applies to the failure of a single channel of one or more input parameters in the following ESFAS Functions: 3

1. Safety Injection Actuation Signal
   Containment Pressure - High
   Pressurizer Pressure – Low

2. Containment Spray Actuation Signal
   Containment Pressure - High-High 1

3. Containment Isolation Actuation Signal
   Containment Pressure - High
   Containment Radiation - High

1

INSERT A

A.1, A.2.1, and A.2.2

Condition a applies to the failure of a single channel of one or more input parameters in the Containment Spray Actuation Signal (CSAS) ESFAS Function.

CSAS coincidence logic is normally two-out-of-four. If one CSAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one CSAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action A.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

One failed channel is restored to OPERABLE status or is placed in trip within 48 hours (Required Action A.2.1 or A.2.2). Required Action A.2.1 restores the full capability of the function. Required Action A.2.2 places the function in a one-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent ESFAS actuation. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

1

INSERT B

B.1 and B.2

Condition B applies to the failure of a single channel of one or more input parameters in the Containment Sump Recirculation Actuation Signal (RAS) ESFAS Function.

ESFAS coincidence logic is normally two-out-of-four. If one ESFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one ESFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action B.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

The failed channel is restored to OPERABLE status within 48 hours (Required Action B.2). Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program (Required Action B.2). The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

1

INSERT C

C.1, C.2.1, C.2.2.1, C.2.2.2

Condition C applies to the failure of a single channel of one or more input parameters in the Auxiliary Feedwater Actuation Signal (AFAS) ESFAS Function.

AFAS coincidence logic is normally two-out-of-four. If one AFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one AFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action C.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

One failed channel is restored to OPERABLE status or is placed in bypass within 48 hours (Required Action C.2.1 or C.2.2). Required Action C.2.1 restores the full capability of the function. Required Action C.2.2 places the function in a two-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent AFAS actuation. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

Additionally, the failed channel must be restored to OPERABLE status prior to entering MODE 3 following the next MODE 5 entry. The Completion Time of Required Action C.2.2.2 is based on adequate channel to channel independence, which allows a two-out-of-three channel operation since no single failure will cause or prevent a reactor trip. However, it is expected that the inoperable channel will be restored to OPERABLE status at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying restoration of the channel as well as any plant configuration changes required or shutting the plant down to repair the channel) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to repair the channel. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Condition C is modified by a Note requiring Required Action C.2.2.2 to be completed whenever the Condition is entered even when the LCO is no longer applicable to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions.

BASES

ACTIONS (continued)

4. Main Steam Isolation Signal
   Steam Generator Pressure - Low

5. ~~Recirculation Actuation Signal~~
   ~~Refueling Water Tank Level - Low~~ (1)

6. ~~Auxiliary Feedwater Actuation Signal~~
   ~~Steam Generator Level - Low~~
   ~~Steam Generator Pressure Difference - High~~ (1)

ESFAS coincidence logic is normally two-out-of-four. If one ESFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one ESFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action ~~B~~ D.1). With one channel in bypass, no additional random failure of a single channel could spuriously ~~trip the reactor~~ cause an actuation and a valid trip signal can still ~~trip the reactor~~ cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously ~~trip the reactor~~ cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip. (3) (1) (1)

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

One failed channel is restored to OPERABLE status or is placed in trip within ~~[~~48~~]~~ hours ~~[or in accordance with the Risk Informed Completion Time Program]~~ (Required Action ~~B~~ D.2.1 or ~~B~~ D.2.2). Required Action ~~B~~ D.2.1 restores the full capability of the function. Required Action ~~B~~ D.2.2 places the function in a one-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent ESFAS actuation. The ~~[~~48~~]~~ hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the ~~[~~48~~]~~ hour period is a low probability event. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ (2) (3) (2) (2)

INSERT E

~~C~~ F.1 and ~~C~~ F.2 (3)

Condition ~~C~~ F applies to the failure of two channels in any of the following ESFAS functions: (3)

1

INSERT E

E.1 and E.2

Condition E applies to failure of two or more channels in the Auxiliary Feedwater Actuation Signal (AFAS) ESFAS Function or two channel in the Containment Spray Actuation System (CSAS) ESAFS Function.

With two inoperable channels, one channel should be placed in bypass, and the other channel should be placed in trip within the 1 hour Completion Time. With one channel of protective instrumentation bypassed, the ESFAS Function is in two-out-of-three logic, but with another channel failed the ESFAS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the ESFAS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, ESFAS actuation will occur.

One of the failed channels should be restored to OPERABLE status within 48 hours. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event. After one channel is restored to OPERABLE status, the provisions of Condition C still apply to the remaining inoperable channel. Therefore, the channel that is still inoperable after completion of Required Action E.2 must be placed in bypass if more than 48 hours has elapsed since the initial channel failure. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

3

BASES

ACTIONS (continued)

1. Safety Injection Actuation Signal
   Containment Pressure - High
   Pressurizer Pressure - Low

3. Containment Isolation ~~Actuation~~ Signal
   Containment Pressure - High
   Containment Radiation - High

1

4. Main Steam Isolation Signal
   Steam Generator Pressure - Low

5. Recirculation Actuation Signal
   Refueling Water Tank Level - Low

~~6. Auxiliary Feedwater Actuation Signal~~
~~Steam Generator Level - Low~~
~~Steam Generator Pressure Difference - High~~

1

With two inoperable channels, one channel should be placed in bypass, and the other channel should be placed in trip within the 1 hour Completion Time. With one channel of protective instrumentation bypassed, the ESFAS Function is in two-out-of-three logic, but with another channel failed the ESFAS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the ESFAS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, ESFAS actuation will occur.

One of the failed channels should be restored to OPERABLE status within ~~[~~48~~]~~ hours, for reasons similar to those stated under Condition ~~B~~ D. After one channel is restored to OPERABLE status, the provisions of Condition ~~B~~ D still apply to the remaining inoperable channel except for Function 5 - RAS. Therefore, the channel that is still inoperable after completion of Required Action ~~C~~ F.2 must be placed in trip if more than ~~[~~48~~]~~ hours has elapsed since the initial channel failure. After one Function 5 – RAS channel is restored to OPERABLE status, the provisions of Condition B still apply to the remaining inoperable channel. The RAS channel that is still inoperable after completion of Required Action F.2 must be restored to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time since the initial channel failure.

Function 1 - SIAS, Function 3 – CIS, Function 4 – MSIS

3 1 3 2 1 3

~~D~~ G.1, ~~D~~ G.2.1, ~~D~~ G.2.2.1, and ~~D~~ G.2.2.2

Condition ~~D~~ G applies to the failure of one bypass removal channel.

The bypass removal channels consist of four sensor subsystems and two actuation subsystems. Condition ~~D~~ G applies to failures in one of the four sensor subsystems, including sensors, bistables, and associated

3

3 1

BASES

ACTIONS (continued)

equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4. 3

In Condition ~~D~~ G, it is permissible to continue operation with one bypass permissive removal channel failed, providing the bypass is disabled (Required Action ~~D~~ G.1). This can be accomplished by removing the bypass with the manual bypass key switch, which disables the bypass in ~~both~~ its respective train~~s~~. Since the bypass Function must be manually enabled, the bypass permissive Function will not by itself cause an undesired bypass insertion. 3 3 1

Alternatively, the bypass may be disabled by defeating the bypass permissive input in one of the four channels to the two-out-of-four bypass removal logic, placing the bypass removal feature in one-out-of-three logic. Thus, any of the remaining three channels is capable of removing the bypass feature when the bypass enable conditions are no longer valid.

If the bypass removal feature in the inoperable channel cannot be defeated, actions to address the inoperability of the affected automatic trip channel must be taken. Required Action ~~D~~ G.2.1, Required Action ~~D~~ G.2.2.1, and Required Action ~~D~~ G.2.2.2 are equivalent to the Required Actions for a single automatic trip channel failure (Condition ~~B~~ D). The Completion Times have the same bases as discussed for Condition ~~B~~ D. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 3 3 2

~~E~~ H.1, ~~E~~ H.2.1, and ~~E~~ H.2.2 3

Condition ~~E~~ H applies to two inoperable bypass removal channels. The bypass removal channels consist of four sensor subsystems and two actuation subsystems. This Condition applies to failures in two of the four sensor subsystems. With two of the four sensor subsystems failed in a nonconservative direction (enabling the bypass Function), the bypass removal feature is in two-out-of-two logic. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4. 3

In Condition ~~E~~ H, it is permissible to continue operation with two bypass permissive channels failed, providing the bypasses are disabled in a similar manner as discussed for Condition ~~D~~ G. 3

BASES

ACTIONS (continued)

If the failed bypasses cannot be disabled, actions to address the inoperability of the affected automatic trip channels must be taken. Required Action ~~E~~ H.2.1 and Required Action ~~E~~ H.2.2 are equivalent to the Required Actions for a two automatic trip channel failure (Condition ~~C~~ F). Also similar to Condition ~~C~~ F, after one set of inoperable channels is restored, the provisions of Condition ~~D~~ G still apply to the remaining inoperable channel, with the Completion Time measured from the point of the initial bypass channel failure. The Completion Times have the same bases as discussed for Condition ~~C~~ G. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~

~~F~~ I.1 and ~~F~~ I.2

If the Required Actions and associated Completion Times of Condition A, B, C, D, ~~or~~ E , F, G, or H are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The SRs for any particular ESFAS Function are found in the SRs column of Table 3.3.~~4~~3-1 for that Function. Most functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION, and response time testing.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~In order for a unit to take credit for topical reports as the basis for justifying Frequencies, topical reports should be supported by an NRC staff Safety Evaluation Report that establishes the acceptability of each topical report for that unit.~~
~~--~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Notes a and b are applied to the setpoint verification Surveillances for each ESFAS Instrumentation (Analog) Function in Table 3.3.4-1 unless one or more of the following exclusions apply:~~

~~1. Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~

~~2. Settings associated with safety relief valves are excluded. The performance of these components is already controlled (i.e., trended with as-left and as-found limits) under the ASME Code for Operation and Maintenance of Nuclear Power Plants testing program.~~ 4

~~3. Functions and Surveillance Requirements which test only digital components are normally excluded. There is no expected change in result between SR performances for these components. Where separate as-left and as-found tolerance is established for digital component SRs, the requirements would apply.~~

~~---~~

SR 3.3.~~4~~ 3 .1 3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when Surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of about once every shift is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The~~ 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~CHANNEL CHECK supplements less formal, but more frequent, checks of CHANNEL OPERABILITY during normal operational use of displays associated with the LCO required channels.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

3

SR 3.3.4.2 3

~~[A CHANNEL FUNCTIONAL TEST is performed every [92] days to ensure the entire channel will perform its intended function when needed.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Move to end of this SR 3.3.3.2 description

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

A CHANNEL FUNCTIONAL TEST on each ESFAS instrument channel is performed to ensure the entire channel will perform its intended function when needed.

A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 1

The CHANNEL FUNCTIONAL TEST tests the individual sensor subsystems using an analog test input to each bistable.

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

acceptance criteria band

A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified ~~tolerance~~ around the setpoint. Any setpoint adjustment shall be consistent with the assumptions of the plant specific setpoint analysis. 1

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. ~~The requirements for this review are outlined in Reference [10].~~ 1

3 3

(e.g., outside the conservative side of the as-found acceptance criteria band)

acceptance criteria band

SR 3.3.~~4~~.2 is modified by two Notes as identified in Table 3.3.~~4~~-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. 3 1

acceptance criteria band
NTSP
NTSP
NTSP
acceptance criteria bands
NTSP

The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ of the ~~[LTSP]~~. Where a setpoint more conservative than the ~~[LTSP]~~ is used in the plant surveillance procedures ~~[NTSP]~~, the as-left and as-found ~~tolerances~~, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ of the ~~[LTSP]~~, then the channel shall be declared inoperable. 1 2 2 1 1 2

acceptance criteria band
NTSP
acceptance criteria bands

The second Note also requires that ~~[LTSP]~~ and the methodologies for calculating the as-left and the as-found ~~tolerances~~ be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. 2 1 2

the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively.

3

SR 3.3.~~4~~.3 3

3 3

SR 3.3.~~4~~.3 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.~~4~~.2, except 3.3.~~4~~.3 is ~~performed within 92 days prior to startup and is~~ only applicable to bypass Functions. These include the Pressurizer Pressure - Low bypass and the MSIS Steam Generator Pressure - Low bypass. A successful test of the required contact(s) of a channel relay may be 3 1

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~The CHANNEL FUNCTIONAL TEST for proper operation of the bypass removal Functions is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass removal Function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by the appropriate ESFAS Function CHANNEL FUNCTIONAL TEST.~~ 1

~~The allowance to conduct this Surveillance within 92 days of startup is based upon the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 11).~~ 1

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 1

3

SR 3.3.4.4 3

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the extension analysis. ~~The requirements for this review are outlined in Reference [10].~~ 1

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Move to end of this SR 3.3.3.4 description

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

SR 3.3.~~4~~ 3.4 is modified by two Notes as identified in Table 3.3.~~4~~ 3-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~ NTSP, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and~~/or~~ Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable.

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively.

SR 3.3.~~4~~ 3.5

This Surveillance ensures that the train actuation response times are the maximum values assumed in the safety analyses. Individual component response times are not modeled in the analyses. The analysis models the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment in both trains reaches the required functional state (e.g.,

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

pumps at rated discharge pressure, valves in full open or closed position). Response time testing acceptance criteria are included in Reference 5. The test may be performed in one measurement or in overlapping segments, with verification that all components are measured.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following TS Bases are applicable to plants adopting CEOG Topical Report CE NPSD-1167-1, "Elimination of Pressure Sensor Response Time Testing Requirements," and the methodology contained in Attachment 1 to TSTF-569.~~
~~---~~ 2

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. ~~Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 12) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. The response time may be verified for components that replace the components that were previously evaluated in Ref. 12 provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 13). Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.~~ 1

~~[ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every [18] months. This results in the interval between successive tests of a given channel of n x 18 months, where n is the number of channels in the Function. Surveillance of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every [18] months. The [18] month STAGGERED TEST BASIS 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.~~ 2

~~OR~~

3 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~

REFERENCES

1. Technical Requirements Manual

~~1~~ 2. Regulatory Guide 1,105, "Setpoints for Safety-Related Instrumentation," Revision 3.

~~2~~ 3. 10 CFR 50, Appendix A.

~~3~~ 4. 10 CFR 100. 50.67

~~4~~ 5. U FSAR, Section ~~[~~7.3~~]~~.

~~5. NRC Safety Evaluation Report, [Date].~~

6. IEEE Standard 279-1971.

7. U FSAR, Chapter ~~[14]~~ 15.

8. 10 CFR 50.49.

9. IC-3.17, FPL Setpoint Standard. ~~"Plant Protection System Selection of Trip Setpoint Values."~~

~~10. FSAR, Section [7.2].~~

~~11. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

~~12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."~~

~~13. Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing."~~

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.4 Engineered Safety Features Actuation System (ESFAS) Instrumentation ~~(Analog)~~

3

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based upon the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary and to mitigate accidents. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the ESFAS, as well as LCOs on other reactor system parameters and equipment performance.

Technical Specifications are required by 10 CFR 50.36 to include LSSSs for variables that have significant safety functions. LSSS are defined by the regulation as "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a safety action is initiated, as established by the safety analysis, to ensure that a SL is not exceeded. Any automatic protection action that occurs on reaching the Analytical Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protection channels must be chosen to be more conservative than the Analytical Limit to account for instrument loop uncertainties related to the setting at which the automatic protective action would actually occur.

~~-----REVIEWER'S NOTE-----~~

~~The term "Limiting Trip Setpoint" [LTSP] is generic terminology for the calculated trip setting (setpoint) value calculated by means of the plant specific setpoint methodology documented in a document controlled under 10 CFR 50.59. The term [LTSP] indicates that no additional margin has been added between the Analytical Limit and the calculated trip setting.~~

~~"Nominal Trip Setpoint [NTSP]" is the suggested terminology for the actual setpoint implemented in the plant surveillance procedures where margin has been added to the calculated [LTSP]. The as-found and as-left tolerances will apply to the [NTSP] implemented in the Surveillance procedures to confirm channel performance.~~

3

BASES

BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note b of Table 3.3.4-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ 4

~~Where the [LTSP] is not included in Table 3.3.4-1, the plant specific location for the [LTSP] or [NTSP] much be cited in Note b of Table 3.3.4-1. The brackets indicate plant specific terms may apply, as required and approved by the NRC.~~ 4

The ~~[Limiting~~ Nominal Trip Setpoint (~~LTSP)]~~ NTSP) specified in ~~Table 3.3.4-1~~ Technical Requirements Manual (Ref. 1) is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[LTSP]~~ NTSP accounts for uncertainties in setting the channel (e.g., calibration), uncertainties in how the channel might actually perform (e.g., repeatability), changes in the point of action of the channel over time (e.g., drift during surveillance intervals), and any other factors which may influence its actual performance (e.g., harsh accident environments). In this manner, the ~~[LTSP]~~ NTSP ensures that SLs are not exceeded. As such, the ~~[LTSP]~~ NTSP meets the definition of an LSSS (Ref. ~~1~~ 2). 1

Technical Specifications contain values related to the OPERABILITY of equipment required for safe operation of the facility. OPERABLE is defined in Technical Specifications as "...being capable of performing its safety function(s)." Relying solely on the ~~[LTSP]~~ NTSP to define OPERABILITY in Technical Specifications would be an overly restrictive requirement if it were applied as an OPERABILITY limit for the "as-found" value of a protection channel setting during a Surveillance. This would result in Technical Specification compliance problems, as well as reports and corrective actions required by the rule which are not necessary to ensure safety. For example, an automatic protection channel with a setting that has been found to be different from the ~~[LTSP]~~ NTSP due to some drift of the setting may still be OPERABLE because drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the ~~[LTSP]~~ NTSP and thus the automatic protective action would still have ensured that the SL would not be exceeded with the "as-found" setting of the protection channel. Therefore, the channel would still be OPERABLE because it would have performed its safety function and the only corrective action required would be to reset the channel within the established as-left ~~tolerance~~ acceptance criteria band around the ~~[LTSP]~~ NTSP to account for further drift during the next surveillance interval. Note that, 2 1

3 1

BASES

BACKGROUND (continued)

acceptance criteria band 1

although the channel is OPERABLE under these circumstances, the trip setpoint must be left adjusted to a value within the as-left ~~tolerance~~, in accordance with uncertainty assumptions stated in the referenced setpoint methodology (as-left criteria), and confirmed to be operating within the statistical allowances of the uncertainty terms assigned (as-found criteria).

However, there is also some point beyond which the channel may not be able to perform its function due to, for example, greater than expected drift. This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the channels and is designated as the Allowable Value.

If the actual setting (as-found setpoint) of the channel is found to be conservative with respect to the Allowable Value but is beyond the as-found acceptance criteria ~~tolerance~~ band, the channel is OPERABLE, but degraded. The degraded condition will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[Normal Trip Setpoint (~~NTSP~~)]~~ (within the allowed acceptance criteria band ~~tolerance~~), and evaluating the channel response. If the channel is functioning as required and is expected to pass the next surveillance, then the channel is OPERABLE and can be restored to service at the completion of the surveillance. After the surveillance is completed, the channel as-found condition will be entered into the Corrective Action Program for further evaluation. 1 2

During anticipated operational occurrences (AOOs), which are those events expected to occur one or more times during the plant life, the acceptable limits are:

- The departure from nucleate boiling ratio (DNBR) shall be maintained above the SL value to prevent departure from nucleate boiling,
- Fuel centerline melting shall not occur, and
- The Reactor Coolant System (RCS) pressure SL of ~~[~~2750~~]~~ psia shall not be exceeded. 2

Maintaining the parameters within the above values ensures that the offsite dose will be within the 10 CFR 50 (Ref. ~~2~~ 3) and 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) criteria during AOOs. 1

Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 (Ref. ~~3~~ 4) limits. Different accident categories allow 1 3

BASES

BACKGROUND (continued)

a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event.

The ESFAS contains devices and circuitry that generate the following signals when the monitored variables reach levels that are indicative of conditions requiring protective action:

1. Safety Injection Actuation Signal (SIAS),
2. Containment Spray Actuation Signal (CSAS),
3. Containment Isolation Actuation Signal (CIAS),
4. Main Steam Isolation Signal (MSIS),
5. Recirculation Actuation Signal (RAS), and
6. Auxiliary Feedwater Actuation Signal (AFAS).

Equipment actuated by each of the above signals is identified in the U FSAR (Ref. ~~4~~ 5). 1

Each of the above ESFAS actuation systems is segmented into four sensor subsystems and two actuation subsystems. Each sensor subsystem includes measurement channels and bistables. ~~The actuation subsystems include two logic subsystems for sequentially loading the diesel generators.~~ 1

Each of the four sensor subsystem channels monitors redundant and independent process measurement channels. Each sensor is monitored by at least one bistable. The bistable associated with each ESFAS Function will trip when the monitored variable exceeds the ~~[LTSP]~~ NTSP. When tripped, the sensor subsystems provide outputs to the two actuation subsystems. 2

The two independent actuation subsystems compare the four sensor subsystem outputs. If a trip occurs in the same parameter in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem will initiate one train of ESFAS. Each train can provide protection to the public in the case of a Design Basis Event. Actuation Logic is addressed in LCO 3.3.~~5~~ 4, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip~~ Actuation." 3

Each of the four sensor subsystems is mounted in a separate cabinet, excluding the sensors and field wiring.

BASES

BACKGROUND (continued)

The role of the sensor subsystem (measurement channels and bistables) is discussed below; actuation subsystems are discussed in LCO 3.3.~~5~~ 4. 1

Measurement Channels

Measurement channels, consisting of field transmitters or process sensors and associated instrumentation, provide a measurable electronic signal based upon the physical characteristics of the parameter being measured.

Four identical measurement channels with electrical and physical separation are provided for each parameter used in the generation of trip signals. These are designated Channels A through D. Measurement channels provide input to ESFAS bistables within the same ESFAS channel. ~~In addition, some measurement channels may also be used as inputs to Reactor Protective System (RPS) bistables, and most provide indication in the control room.~~ Measurement channels used as an input to ~~the RPS or~~ ESFAS are not used for control Functions. 1

When a channel monitoring a parameter indicates an unsafe condition, the bistable monitoring the parameter in that channel will trip. Tripping two or more channels of bistables monitoring the same parameter will de-energize both channels of Actuation Logic of the associated Engineered Safety Features (ESF) equipment.

Three of the four measurement and bistable channels are necessary to meet the redundancy and testability of GDC 21 in Appendix A to 10 CFR 50 (Ref. 2). The fourth channel provides additional flexibility by allowing one channel to be removed from service (trip channel bypass) for maintenance or testing while still maintaining a minimum two-out-of-three logic. The single failure criterion is met during this condition. 1

~~In order to take full advantage of the four channel design, adequate channel to channel independence must be demonstrated, and approved by the NRC staff. Plants not currently licensed to credit four channel independence that may desire this capability must have approval of the NRC staff documented by an NRC Safety Evaluation Report (Ref. 5). Adequate channel to channel independence includes physical and electrical independence of each channel from the others. Furthermore, each channel must be energized from separate inverters and station batteries. Plants not demonstrating four channel independence may operate in a two-out-of-three logic configuration for 48 hours.~~ 1

Since no single failure will either cause or prevent a protective system actuation and no protective channel feeds a control channel, this arrangement meets the requirements of IEEE Standard ~~79~~ 279-1971 (Ref. 6). 1

3

BASES

BACKGROUND (continued)

Bistable Trip Units

Bistable trip units receive an analog input from the measurement channels, compare the analog input to trip setpoints, and provide contact output to the Actuation Logic. They also provide local trip indication and remote annunciation.

There are four channels of bistables, designated A through D, for each ESF Function, one for each measurement channel. ~~In cases where two ESF Functions share the same input and trip setpoint (e.g., containment pressure input to CSAS, CIAS, and SIAS and a Pressurizer Pressure - Low input to the RPS and SIAS), the same bistable may be used to satisfy both Functions.~~ SIAS and MSIS Functions share the Containment Pressure measurement channel inputs and trip setpoints. The bistables are shared to satisfy both Functions. 1

The trip setpoints and Allowable Values used in the bistables are based on the analytical limits stated in Reference 7. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment effects, for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 8), Allowable Values specified in Table 3.3.~~4~~ 3-1, in the accompanying LCO, are conservatively adjusted with respect to the analytical limits. A detailed description of the method used to calculate the trip setpoints, including their explicit uncertainties, is provided in ~~the "Plant Protection System Selection of Trip Setpoint Values"~~ IC-3.17, "FPL Setpoint Standard" (Ref. 9). The actual trip setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the interval between surveillances. 3 1

The ~~[LTSP]~~ NTSP is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[LTSP]~~ NTSP value is the LSSS and ensures the safety analysis limits are met for the surveillance interval selected when a channel is adjusted based on stated channel uncertainties. 2

~~[LTSPs]~~ NTSP, in conjunction with the use of as-found and as-left ~~tolerances~~ acceptance criteria bands, consistent with the requirements of the Allowable Value will ensure that Safety Limits of Chapter 2.0, "SAFETY LIMITS (SLs)," are not violated during AOOs and that the consequences of Design Basis Accidents (DBAs) will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed. 2 1

3 1

BASES

BACKGROUND (continued)

Note that in the accompanying LCO 3.3.~~4~~, the Allowable Values of the Table 3.3.~~4~~-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION or CHANNEL FUNCTIONAL TEST.

ESFAS Logic

It is possible to change the two-out-of-four ESFAS logic to a two-out-of-three logic for a given input parameter in one channel at a time by ~~disabling~~ bypassing one channel input to the logic. Thus, the bistables will function normally, producing normal trip indication and annunciation~~, but ESFAS actuation will not occur since the bypassed channel is effectively removed from the coincidence logic. Trip channel bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. At some plants an interlock prevents simultaneous trip channel bypassing of the same parameter in more than one channel.~~ Trip channel bypassing is normally employed during maintenance or testing.

ESFAS Logic is addressed in LCO 3.3.~~5~~ 4.

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. Functions such as Manual Initiation, not specifically credited in the accident analysis, serve as backups to Functions and are part of the NRC approved licensing basis for the plant.

~~Permissive and interlock setpoints allow the blocking of trips during plant startups, and restoration of trips when the permissive conditions are not satisfied, but they are not explicitly modeled in the Safety Analyses. These permissives and interlocks ensure that the starting conditions are consistent with the safety analysis, before preventive or mitigating actions occur. Because these permissives or interlocks are only one of multiple conservative starting assumptions for the accident analysis, they are generally considered as nominal values without regard to measurement accuracy.~~

ESFAS protective Functions are as follows:

3

BASES

APPLICABLE SAFETY ANALYSES (continued)

1. Safety Injection Actuation Signal

The SIAS ensures acceptable consequences during loss of coolant accident (LOCA) events, including steam generator tube rupture, and main steam line breaks (MSLBs) or feedwater line breaks (FWLBs) (inside containment). To provide the required protection, either a high containment pressure or a low pressurizer pressure signal will initiate SIAS. SIAS initiates the Emergency Core Cooling Systems (ECCS), control room isolation, and several other Functions, such as starting the emergency diesel generators.

2. Containment Spray Actuation Signal

The CSAS initiates containment spray, preventing containment overpressurization during a LOCA or MSLB. ~~At some plants,~~ both a high- high containment pressure signal and an SIAS have to actuate to provide the required protection. This configuration reduces the likelihood of inadvertent containment spray. 1

3. Containment Isolation Actuation Signal 1

The CIAS actuates the Containment Isolation System, ensuring acceptable consequences during LOCAs and MSLBs or FWLBs (inside containment). To provide protection, a high containment pressure signal will initiate CIAS at the same setpoint at which an SIAS is generated. A high containment radiation signal will also initiate CIAS. 1

4. Main Steam Isolation Signal

The MSIS ensures acceptable consequences during an MSLB or FWLB by isolating both steam generators if either generator indicates a low steam generator pressure. The MSIS, concurrent with or following a reactor trip, minimizes the rate of heat extraction and subsequent cooldown of the RCS during these events. A high containment pressure signal will also initiate MSIS. 1

5. Recirculation Actuation Signal

At the end of the injection phase of a LOCA, the refueling water tank (RWT) will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sump. Switchover from RWT to the containment sump must occur before the RWT empties to prevent damage to the ECCS pumps and

BASES

APPLICABLE SAFETY ANALYSES (continued)

a loss of core cooling capability. For similar reasons, switchover must not occur before there is sufficient water in the containment sump to support pump suction. Furthermore, early switchover must not occur to ensure sufficient borated water is injected from the RWT to ensure the reactor remains shut down in the recirculation mode. An RWT Level - Low signal initiates the RAS.

6. Auxiliary Feedwater Actuation Signal

the affected

An AFAS initiates feedwater flow to ~~both~~ steam generator~~s~~ if a low level is indicated in ~~either~~ steam generator, unless the generator is ~~ruptured~~. 1

faulted the affected

The AFAS maintains a steam generator heat sink during the following events:

- MSLB,
- FWLB,
- Inadvertent opening of a steam generator atmospheric dump valve, and
- Loss of feedwater.

A low steam generator water level signal will initiate auxiliary feed to the affected steam generator.

, or feedwater header (FW) differential pressure (FW-A > FW-B) or (FW-B > FW-A), 1

Secondary steam generator (SG) differential pressure (SG-A > SG-B) or (SG-B > SG-A) inhibits auxiliary feed to a generator identified as being ~~ruptured~~. This input to the AFAS logic prevents loss of the intact generator while preventing feeding a ~~ruptured~~ generator during MSLBs and FWLBs. This prevents containment overpressurization during these events. 1

faulted faulted

The ESFAS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires all channel components necessary to provide an ESFAS actuation to be OPERABLE. Failure of any required portion of the instrument channel renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. The specific criteria for determining channel OPERABILITY differ slightly between Functions. These criteria are discussed on a Function by Function basis below.

BASES

LCO (continued)

Actions allow maintenance (trip channel) bypass of individual channels~~, but the bypass activates interlocks that prevent operation with a second channel in the same Function bypassed~~. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). ~~At plants where adequate channel to channel independence has been demonstrated, specific exceptions may be approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~ 1 1

Allowable Values for ESFAS Instrumentation (Analog) Functions are specified in Table 3.3.~~4~~3-1. ~~[LTSPs]~~ NTSP and the methodologies for calculation of the as-left and as-found ~~tolerances~~ acceptance criteria bands are described in ~~[insert the name of a document controlled under 10 CFR 50.59 such as~~ the Technical Requirements Manual (Ref. 1) and Section 7.3 of the Updated Final Safety Analysis Report (Ref. 5). ~~or any document incorporated into the facility FSAR]~~. The ~~[LTSPs]~~ NTSPs are selected to ensure that the actual setpoints remain conservative with respect to the as-found ~~tolerance~~ acceptance criteria band between successive CHANNEL CALIBRATIONS. After each calibration the trip setpoint shall be left within the as-left band around the ~~[LTSP]~~ NTSP. 1 3 2 2 2 1 2

The Bases for the LCO on ESFAS Functions are:

1. <u>Safety Injection Actuation Signal</u>

   a. <u>Containment Pressure - High</u>

      This LCO requires four channels of SIAS Containment Pressure - High to be OPERABLE in MODES 1, 2, and 3.

      The Allowable Value for this trip is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

   b. <u>Pressurizer Pressure - Low</u>

      This LCO requires four channels of SIAS Pressurizer Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

BASES

LCO (continued)

The Allowable Value for this trip is set low enough to prevent actuating the SIAS during normal plant operation and pressurizer pressure transients. The setting is high enough that with a LOCA or MSLB it will actuate to perform as expected, mitigating the consequences of the accidents.

The Pressurizer Pressure - Low trip may be blocked when pressurizer pressure is reduced during controlled plant shutdowns. This block is permitted below 1836 ~~1800~~ psia, and block permissive responses are annunciated in the control room. This allows for a controlled depressurization of the RCS, while maintaining administrative control of ESF protection. From a blocked condition, the block will be automatically removed as pressurizer pressure increases above 1836 ~~1800~~ psia, as sensed by two of the four sensor subsystems~~, in accordance with the bypass philosophy of removing bypasses when the enabling conditions are no longer satisfied~~. 1 1

This LCO requires four channels of the bypass permissive removal for SIAS Pressurizer Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

The bypass permissive channels consist of four sensor subsystems and two actuation subsystems. This LCO applies to failures in the four sensor subsystems, including sensors, bistables, and associated equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4. 3

This LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The block permissive is set low enough so as not to be enabled during normal plant operation, but high enough to allow blocking prior to reaching the trip setpoint.

2. <u>Containment Spray Actuation Signal</u>

CSAS is initiated either manually or automatically. ~~At many plants,~~ It is also necessary to have an automatic or manual SIAS for complete actuation. ~~The SIAS opens the containment spray valves, whereas the CSAS actuates other required components.~~ The SIAS requirement should always be satisfied on a legitimate CSAS, since 1 1

3

BASES

LCO (continued)

lower than the Containment Pressure – High-High signal

The parameters used for CSAS (Containment Pressure High-High and SIAS) give direct indication of a LOCA. The time to actuate CSAS depends on the break size. The Containment Pressure High-High set point is the controlling parameter since for all break sizes it takes longer to reach this set point than the SIAS set point.

the Containment Pressure - High signal setpoint used in the SIAS is ~~the same~~ setpoint used in the CSAS. ~~At many plants, the transmitters used to initiate CSAS are independent of those used in the SIAS to prevent inadvertent containment spray due to failures in two sensor channels.~~ 1

a. Containment Pressure - High -High 1

This LCO requires four channels of CSAS Containment Pressure - High -High to be OPERABLE in MODES 1, 2, and 3. 1

The Allowable Value is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

~~The Containment Pressure - High setpoint is the same in the SIAS (Function 1), CSAS (Function 2), and CIAS (Function 3). However, different sensors and logic are used in each of these Functions.~~ 1

3. Containment Isolation Actuation Signal 1

a. Containment Pressure - High

This LCO requires four channels of CIAS Containment Pressure - High to be OPERABLE in MODES 1, 2, and 3. 1

The Allowable Value is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

The Containment Pressure - High setpoint is the same in the SIAS (Function 1)~~, CSAS (Function 2),~~ and CIAS (Function 3). However, different ~~sensors and~~ logic ~~are~~ is used in each of these Functions. 1

BASES

LCO (continued)

b. Containment Radiation - High

This LCO requires four channels of CIAS Containment Radiation - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value is high enough to avoid unnecessary actuation, but adequate to provide diverse actuation of the CI~~A~~S in the event of a LOCA. 1

4. Main Steam Isolation Signal

The MSIS is required to be OPERABLE in MODES 1, 2, and 3 except when all associated valves are closed and de-activated.

a. Steam Generator Pressure - Low

This LCO requires four channels of MSIS Steam Generator Pressure - Low for each steam generator to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value is set below the full load operating value for steam pressure so as not to interfere with normal plant operation. However, the setting is high enough to provide the required protection for excessive steam demand. An excessive steam demand causes the RCS to cool down, resulting in a positive reactivity addition to the core. An MSIS is required to prevent the excessive cooldown.

This Function may be manually blocked when steam generator pressure is reduced during controlled plant cooldowns. The block is permitted below ~~785~~ 700 psia, and block permissive responses are annunciated in the control room. This allows a controlled depressurization of the secondary system, while maintaining administrative control of ESF protection. From a blocked condition, the block will be removed automatically as steam generator pressure increases above ~~785~~ 700 psia, as sensed by two of the four sensor subsystems~~, in accordance with the bypass philosophy of removing bypasses when the enabling conditions are no longer satisfied~~. 1 1 1

This LCO requires four channels per steam generator of the bypass removal for MSIS Steam Generator Pressure - Low to be OPERABLE in MODES 1, 2, and 3.

BASES

LCO (continued)

The bypass removal channels consist of four sensor subsystems and two actuation subsystems. This LCO applies to failures in the four sensor subsystems, including sensors, bistables, and associated equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4. 3

This LCO applies to the bypass removal feature only. If the bypass enable Function is failed so as to prevent entering a bypass condition, operation may continue.

The block permissive is set low enough so as not to be enabled during normal plant operation, but high enough to allow blocking prior to reaching the trip setpoint.

INSERT 1A 1

5. Recirculation Actuation Signal

a. Refueling Water Tank Level - Low

This LCO requires four channels of RWT Level - Low to be OPERABLE in MODES 1, 2, and 3.

The upper limit on the Allowable Value for this trip is set low enough to ensure RAS does not initiate before sufficient water is transferred to the containment sump. Premature recirculation could impair the reactivity control Function of safety injection by limiting the amount of boron injection. Premature recirculation could also damage or disable the recirculation system if recirculation begins before the sump has enough water to prevent air ~~containment~~ entrainment in the suction. The lower limit on the RWT Level - Low trip Allowable Value is high enough to transfer suction to the containment sump prior to emptying the RWT. 1

6. Auxiliary Feedwater Actuation Signal

The AFAS logic actuates auxiliary feedwater (AFW) to a steam generator on low level in that generator unless it has been identified as being ~~ruptured~~ faulted.

A low level in ~~either~~ the faulted steam generator, as sensed by each steam a two-out-of-four coincidence of four wide range sensors for ~~any~~ generator, will generate an AFAS start signal, which starts ~~both~~ the affected train~~s~~ of AFW 1 1

1

INSERT 1A

b. Containment Pressure - High

This LCO requires four channels of MSIS Containment Pressure - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value is set high enough to allow for small pressure increases in containment expected during normal operation (i.e., plant heatup) and is not indicative of an offnormal condition. The setting is low enough to initiate the ESF Functions when an offnormal condition is indicated. This allows the ESF systems to perform as expected in the accident analyses to mitigate the consequences of the analyzed accidents.

BASES

LCO (continued)

the affected
, and the feedwater header differential pressure in both feedwater headers,
1
1

pumps and feeds ~~both~~ steam generator~~s~~. The AFAS also monitors the secondary differential pressure in both steam generators and initiates an AFAS block signal to a ~~ruptured~~ generator, if the pressure in ~~that generator is lower than that in the other generator~~ by the differential pressure setpoint.

one steam generator is lower than the other steam generator, or the pressure in one feedwater header is lower than the other feedwater header,
faulted
1

a. Steam Generator A/B Level - Low

This LCO requires four channels for each steam generator of Steam Generator Level - Low to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value ensures adequate time exists to initiate AFW while the steam generators can function as a heat sink.

b. Steam Generator Pressure Difference - High (SG-A > SG-B) or (SG-B > SG-A)

This LCO requires four channels per steam generator of Steam Generator Pressure Difference - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value for this trip is high enough to allow for small pressure differences and normal instrumentation errors between the steam generator channels during normal operation without an actuation. The setting is low enough to detect and inhibit feeding of a ~~ruptured~~ steam generator in the event of an MSLB or FWLB, while permitting the feeding of the intact steam generator.
faulted
1

INSERT 1
1

The ESFAS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

APPLICABILITY

All ESFAS Functions are required to be OPERABLE in MODES 1, 2, and 3. In MODES 1, 2, and 3 there is sufficient energy in the primary and secondary systems to warrant automatic ESF System responses to:

- Close the main steam isolation valves to preclude a positive reactivity addition,
- Actuate AFW to preclude the loss of the steam generators as a heat sink (in the event the normal feedwater system is not available),
- Actuate ESF systems to prevent or limit the release of fission product radioactivity to the environment by isolating containment and limiting the containment pressure from exceeding the containment design pressure during a design basis LOCA or MSLB, and

1

INSERT 1

b. Feedwater Header Pressure Difference - High (FW-A > FW-B) or (FW-B > FW-A)

This LCO requires four channels per feedwater subsystem of Feedwater Header Pressure Difference - High to be OPERABLE in MODES 1, 2, and 3.

The Allowable Value for this trip is high enough to allow for small pressure differences and normal instrumentation errors between the feedwater header channels during normal operation without an actuation. The setting is low enough to detect and inhibit feeding of a faulted steam generator in the event of an MSLB or FWLB, while permitting the feeding of the intact steam generator.

BASES

APPLICABILITY (continued)

- Actuate ESF systems to ensure sufficient borated inventory to permit adequate core cooling and reactivity control during a design basis LOCA or MSLB accident.

In MODES 4, 5, and 6, automatic actuation of ESFAS Functions is not required because adequate time is available for plant operators to evaluate plant conditions and respond by manually operating the ESF components, if required, as addressed by LCO 3.3.~~5~~ 4. In LCO 3.3.~~5~~ 4, 3
manual capability is required for Functions other than AFAS in MODE 4, even though automatic actuation is not required. Because of the large number of components actuated on each ESFAS, actuation is simplified by the use of the Manual ~~Trip~~ Actuation push buttons. Manual ~~Trip~~ Actuation of AFAS is not required in MODE 4 because AFW or shutdown cooling will already be in operation in this MODE. 1

The ESFAS Actuation Logic must be OPERABLE in the same MODES as the automatic and Manual ~~Trip~~ actuation. In MODE 4, only the portion of the ESFAS logic responsible for the required Manual ~~Trip~~ Actuation must be OPERABLE. 1

In MODES 5 and 6, ESFAS initiated systems are either reconfigured or disabled for shutdown cooling operation. Accidents in these MODES are slow to develop and would be mitigated by manual operation of individual components.

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis.

Typically, the drift is small and results in a delay of actuation rather than a total loss of function. Determination of setpoint drift is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it to within specification. If the actual trip setpoint is nonconservative with respect to the Allowable Value in Table 3.3.~~4~~ 3-1, the channel is inoperable and the appropriate Condition(s) are entered. 3

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value in Table 3.3.~~4~~ 3-1, or the channel is not functioning as required, or the sensor, instrument loop, signal processing electronics, or ESFAS bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the plant must enter the Condition statement for the particular protection Function affected. 3

3

BASES

ACTIONS (continued)

When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

A Note has been added to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function in Table 3.3.~~4~~ 3-1. Completion Times for the inoperable channel of a Function will be tracked separately. 3

INSERT A

~~[A.1~~ 2

INSERT B

INSERT C

~~Condition A applies to one CSAS Containment Pressure - High channel inoperable. CSAS logic is identical to that of the other ESFAS Functions; however, the inadvertent actuation of a CSAS is undesirable, since it may damage equipment inside containment. For this reason, placing the inoperable channel in trip is not an option as it is in Conditions B and C.]~~ 1

~~[For those plants in which the SIAS is required for a complete CSAS actuation, Condition B for one ESFAS channel inoperable and Condition C for two ESFAS channels inoperable may be preferable to Condition A.~~

~~If one CSAS channel is inoperable, operation is allowed to continue, providing the inoperable channel is placed in bypass within 1 hour. The Completion Time of 1 hour allotted to bypass the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.]~~

~~B~~ D.1, ~~B~~ D.2.1, and ~~B~~ D.2.2 3

Condition ~~B~~ D applies to the failure of a single channel of one or more input parameters in the following ESFAS Functions: 3

1. Safety Injection Actuation Signal
   Containment Pressure - High
   Pressurizer Pressure – Low 1

2. Containment Spray Actuation Signal
   Containment Pressure - High-High

3. Containment Isolation Actuation Signal
   Containment Pressure - High
   Containment Radiation - High

3

1

1

INSERT A

A.1, A.2.1, and A.2.2

Condition a applies to the failure of a single channel of one or more input parameters in the Containment Spray Actuation Signal (CSAS) ESFAS Function.

CSAS coincidence logic is normally two-out-of-four. If one CSAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one CSAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action A.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

One failed channel is restored to OPERABLE status or is placed in trip within 48 hours (Required Action A.2.1 or A.2.2). Required Action A.2.1 restores the full capability of the function. Required Action A.2.2 places the function in a one-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent ESFAS actuation. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

1

INSERT B

B.1 and B.2

Condition B applies to the failure of a single channel of one or more input parameters in the Containment Sump Recirculation Actuation Signal (RAS) ESFAS Function.

ESFAS coincidence logic is normally two-out-of-four. If one ESFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one ESFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action B.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

The failed channel is restored to OPERABLE status within 48 hours (Required Action B.2). Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program (Required Action B.2). The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

1

INSERT C

C.1, C.2.1, C.2.2.1, C.2.2.2

Condition C applies to the failure of a single channel of one or more input parameters in the Auxiliary Feedwater Actuation Signal (AFAS) ESFAS Function.

AFAS coincidence logic is normally two-out-of-four. If one AFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one AFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action C.1). With one channel in bypass, no additional random failure of a single channel could spuriously cause an actuation and a valid trip signal can still cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

One failed channel is restored to OPERABLE status or is placed in bypass within 48 hours (Required Action C.2.1 or C.2.2). Required Action C.2.1 restores the full capability of the function. Required Action C.2.2 places the function in a two-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent AFAS actuation. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event.

Additionally, the failed channel must be restored to OPERABLE status prior to entering MODE 3 following the next MODE 5 entry. The Completion Time of Required Action C.2.2.2 is based on adequate channel to channel independence, which allows a two-out-of-three channel operation since no single failure will cause or prevent a reactor trip. However, it is expected that the inoperable channel will be restored to OPERABLE status at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying restoration of the channel as well as any plant configuration changes required or shutting the plant down to repair the channel) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to repair the channel. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Condition C is modified by a Note requiring Required Action C.2.2.2 to be completed whenever the Condition is entered even when the LCO is no longer applicable to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions.

BASES

ACTIONS (continued)

4. Main Steam Isolation Signal
Steam Generator Pressure - Low

5. ~~Recirculation Actuation Signal~~
~~Refueling Water Tank Level - Low~~

6. ~~Auxiliary Feedwater Actuation Signal~~
~~Steam Generator Level - Low~~
~~Steam Generator Pressure Difference - High~~

ESFAS coincidence logic is normally two-out-of-four. If one ESFAS channel is inoperable, startup or power operation is allowed to continue as long as action is taken to restore the design level of redundancy.

If one ESFAS channel is inoperable, startup or power operation is allowed to continue, providing the inoperable channel is placed in bypass or trip within 1 hour (Required Action ~~B~~ D.1). With one channel in bypass, no additional random failure of a single channel could spuriously ~~trip the reactor~~ cause an actuation and a valid trip signal can still ~~trip the reactor~~ cause an actuation. With one channel in trip, an additional random failure of a single channel could spuriously ~~trip the reactor~~ cause an actuation. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.

The Completion Time of 1 hour allotted to bypass or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel and still ensures that the risk involved in operating with the failed channel is acceptable.

INSERT D

~~One failed channel is restored to OPERABLE status or is placed in trip within [48] hours [or in accordance with the Risk Informed Completion Time Program] (Required Action B.2.1 or B.2.2). Required Action B.2.1 restores the full capability of the function. Required Action B.2.2 places the function in a one-out-of-three configuration. In this configuration, common cause failure of the dependent channel cannot prevent ESFAS actuation. The [48] hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a secod channel occurring during the [48] hour period is a low probability event. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~

INSERT E

~~C~~ F.1 and ~~C~~ F.2

Condition ~~C~~ F applies to the failure of two channels in any of the following ESFAS functions:

1

INSERT D

Additionally, the failed channel must be restored to OPERABLE status prior to entering MODE 3 following the next MODE 5 entry. The Completion Time of Required Action D.2 is based on adequate channel to channel independence, which allows a two-out-of-three channel operation since no single failure will cause or prevent a reactor trip. However, it is expected that the inoperable channel will be restored to OPERABLE status at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying restoration of the channel as well as any plant configuration changes required or shutting the plant down to repair the channel) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to repair the channel. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Condition D is modified by a Note requiring Required Action D.2 to be completed whenever the Condition is entered even when the LCO is no longer applicable to ensure the channel is restored to OPERABLE prior to the next reactor startup from MODE 5 conditions.

1

INSERT E

E.1 and E.2

Condition E applies to failure of two or more channels in the Auxiliary Feedwater Actuation Signal (AFAS) ESFAS Function or two channel in the Containment Spray Actuation System (CSAS) ESAFS Function.

With two inoperable channels, one channel should be placed in bypass, and the other channel should be placed in trip within the 1 hour Completion Time. With one channel of protective instrumentation bypassed, the ESFAS Function is in two-out-of-three logic, but with another channel failed the ESFAS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the ESFAS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, ESFAS actuation will occur.

One of the failed channels should be restored to OPERABLE status within 48 hours. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event. After one channel is restored to OPERABLE status, the provisions of Condition C still apply to the remaining inoperable channel. Therefore, the channel that is still inoperable after completion of Required Action E.2 must be placed in bypass if more than 48 hours has elapsed since the initial channel failure. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

BASES

ACTIONS (continued)

1. Safety Injection Actuation Signal
   Containment Pressure - High
   Pressurizer Pressure - Low

3. Containment Isolation Actuation Signal
   Containment Pressure - High
   Containment Radiation - High

4. Main Steam Isolation Signal
   Steam Generator Pressure - Low
   Containment Pressure - High 1

5. Recirculation Actuation Signal
   Refueling Water Tank Level - Low

~~6. Auxiliary Feedwater Actuation Signal~~
~~Steam Generator Level - Low~~
~~Steam Generator Pressure Difference - High~~ 1

With two inoperable channels, one channel should be placed in bypass, and the other channel should be placed in trip within the 1 hour Completion Time. With one channel of protective instrumentation bypassed, the ESFAS Function is in two-out-of-three logic, but with another channel failed the ESFAS may be operating with a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the ESFAS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, ESFAS actuation will occur.

One of the failed channels should be restored to OPERABLE status within ~~[~~48~~]~~ hours, for reasons similar to those stated under Condition ~~B~~ D. 3
After one channel is restored to OPERABLE status, the provisions of Condition ~~B~~ D still apply to the remaining inoperable channel except for Function 5 - RAS. Therefore, the channel Function 1 - SIAS, Function 3 – CIAS, Function 4 – MSIS that is still inoperable after completion of Required Action ~~C~~ F.2 must be placed in trip if more than ~~[~~48~~]~~ hours has elapsed since the initial channel failure. 1 3 2

After one Function 5 – RAS channel is restored to OPERABLE status, the provisions of Condition B still apply to the remaining inoperable channel. The RAS channel that is still inoperable after completion of Required Action F.2 must be restored to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time since the initial channel failure. 1

~~D~~ G.1, ~~D~~ G.2.1, ~~D~~ G.2.2.1, and ~~D~~ G.2.2.2 3

Condition ~~D~~ G applies to the failure of one bypass removal channel.

The bypass removal channels consist of four sensor subsystems and two actuation subsystems. Condition ~~D~~ G applies to failures in one of the four sensor subsystems, including sensors, bistables, and associated 3

BASES

ACTIONS (continued)

equipment. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4.

In Condition ~~D~~ G, it is permissible to continue operation with one bypass permissive removal channel failed, providing the bypass is disabled (Required Action ~~D~~ G.1). This can be accomplished by removing the bypass with the manual bypass key switch, which disables the bypass in ~~both~~ its respective train~~s~~. Since the bypass Function must be manually enabled, the bypass permissive Function will not by itself cause an undesired bypass insertion.

Alternatively, the bypass may be disabled by defeating the bypass permissive input in one of the four channels to the two-out-of-four bypass removal logic, placing the bypass removal feature in one-out-of-three logic. Thus, any of the remaining three channels is capable of removing the bypass feature when the bypass enable conditions are no longer valid.

If the bypass removal feature in the inoperable channel cannot be defeated, actions to address the inoperability of the affected automatic trip channel must be taken. Required Action ~~D~~ G.2.1, Required Action ~~D~~ G.2.2.1, and Required Action ~~D~~ G.2.2.2 are equivalent to the Required Actions for a single automatic trip channel failure (Condition ~~B~~ D). The Completion Times have the same bases as discussed for Condition ~~B~~ D. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~

~~E~~ H.1, ~~E~~ H.2.1, and ~~E~~ H.2.2

Condition ~~E~~ H applies to two inoperable bypass removal channels. The bypass removal channels consist of four sensor subsystems and two actuation subsystems. This Condition applies to failures in two of the four sensor subsystems. With two of the four sensor subsystems failed in a nonconservative direction (enabling the bypass Function), the bypass removal feature is in two-out-of-two logic. Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in LCO 3.3.~~5~~ 4.

In Condition ~~E~~ H, it is permissible to continue operation with two bypass permissive channels failed, providing the bypasses are disabled in a similar manner as discussed for Condition ~~D~~ G.

BASES

ACTIONS (continued)

If the failed bypasses cannot be disabled, actions to address the inoperability of the affected automatic trip channels must be taken. Required Action ~~E~~ H.2.1 and Required Action ~~E~~ H.2.2 are equivalent to the Required Actions for a two automatic trip channel failure (Condition ~~C~~ F). Also similar to Condition ~~C~~ F, after one set of inoperable channels is restored, the provisions of Condition ~~D~~ G still apply to the remaining inoperable channel, with the Completion Time measured from the point of the initial bypass channel failure. The Completion Times have the same bases as discussed for Condition ~~C~~ G. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~

~~F~~ I.1 and ~~F~~ I.2

If the Required Actions and associated Completion Times of Condition A, B, C, D, ~~or~~ E, F, G, or H are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The SRs for any particular ESFAS Function are found in the SRs column of Table 3.3.~~4~~ 3-1 for that Function. Most functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, CHANNEL CALIBRATION, and response time testing.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~In order for a unit to take credit for topical reports as the basis for justifying Frequencies, topical reports should be supported by an NRC staff Safety Evaluation Report that establishes the acceptability of each topical report for that unit.~~
~~--~~

~~----------------------------------REVIEWER'S NOTE----------------------------------~~
~~Notes a and b are applied to the setpoint verification Surveillances for each ESFAS Instrumentation (Analog) Function in Table 3.3.4-1 unless one or more of the following exclusions apply:~~

~~1. Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity~~

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~

~~2. Settings associated with safety relief valves are excluded. The performance of these components is already controlled (i.e., trended with as-left and as-found limits) under the ASME Code for Operation and Maintenance of Nuclear Power Plants testing program.~~ 4

~~3. Functions and Surveillance Requirements which test only digital components are normally excluded. There is no expected change in result between SR performances for these components. Where separate as-left and as-found tolerance is established for digital component SRs, the requirements would apply.~~

3

SR 3.3.4.1 3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when Surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of about once every shift is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The~~ 2

3

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~CHANNEL CHECK supplements less formal, but more frequent, checks of CHANNEL OPERABILITY during normal operational use of displays associated with the LCO required channels.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

3

SR 3.3.~~4~~.2 3

~~[A CHANNEL FUNCTIONAL TEST is performed every [92] days to ensure the entire channel will perform its intended function when needed.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Move to end of this SR 3.3.3.2 description

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

A CHANNEL FUNCTIONAL TEST on each ESFAS instrument channel is performed to ensure the entire channel will perform its intended function when needed.

A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 1

The CHANNEL FUNCTIONAL TEST tests the individual sensor subsystems using an analog test input to each bistable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified ~~tolerance~~ acceptance criteria band around the setpoint. Any setpoint adjustment shall be consistent with the assumptions of the plant specific setpoint analysis. 1

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. ~~The requirements for this review are outlined in Reference [10].~~ 1

SR 3.3.4.2 is modified by two Notes as identified in Table 3.3.4-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found ~~tolerance~~ acceptance criteria band but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band). Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP. Where a setpoint more conservative than the ~~[LTSP]~~ NTSP is used in the plant surveillance procedures ~~[NTSP]~~ NTSP, the as-left and as-found ~~tolerances~~ acceptance criteria bands, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left ~~tolerance~~ acceptance criteria band of the ~~[LTSP]~~ NTSP, then the channel shall be declared inoperable. 3 1 1 2 2 1 1 2

The second Note also requires that ~~[LTSP]~~ NTSP and the methodologies for calculating the as-left and the as-found ~~tolerances~~ acceptance criteria bands be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively. 1 2 2

SR 3.3.4.3 3

SR 3.3.4.3 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.4.2, except 3.3.4.3 is ~~performed within 92 days prior to startup and is~~ only applicable to bypass Functions. These include the Pressurizer Pressure - Low bypass and the MSIS Steam Generator Pressure - Low bypass. A successful test of the required contact(s) of a channel relay may be 3 1

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~The CHANNEL FUNCTIONAL TEST for proper operation of the bypass removal Functions is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass removal Function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by the appropriate ESFAS Function CHANNEL FUNCTIONAL TEST.~~ 1

~~The allowance to conduct this Surveillance within 92 days of startup is based upon the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 11).~~ 1

3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 1

SR 3.3.~~4~~.4 3

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the extension analysis. ~~The requirements for this review are outlined in Reference [10].~~ 1

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Move to end of this SR 3.3.3.4 description

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

SR 3.3.4.4 is modified by two Notes as identified in Table 3.3.4-1. The 3
first Note requires evaluation of channel performance for the condition
where the as-found setting for the channel setpoint is outside its as-found 1
acceptance criteria band ~~tolerance~~ but conservative with respect to the Allowable Value (e.g., outside the conservative side of the as-found acceptance criteria band).
Evaluation of channel performance will verify that the channel will
continue to behave in accordance with safety analysis assumptions and
the channel performance assumptions in the setpoint methodology. The
purpose of the assessment is to ensure confidence in the channel
performance prior to returning the channel to service. For channels
determined to be OPERABLE but degraded, after returning the channel to
service the performance of these channels will be evaluated under the
plant Corrective Action Program. Entry into the Corrective Action
Program will ensure required review and documentation of the condition.
The second Note requires that the as-left setting for the channel be
returned to within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~. Where a setpoint 1 2
more conservative than the NTSP ~~[LTSP]~~ is used in the plant surveillance 2
procedures NTSP ~~[NTSP]~~, the as-left and as-found acceptance criteria bands ~~tolerances~~, as applicable,
will be applied to the surveillance procedure setpoint. This will ensure 1
that sufficient margin to the Safety Limit and ~~/or~~ Analytical Limit is
maintained. If the as-left channel setting cannot be returned to a setting
within the as-left acceptance criteria band ~~tolerance~~ of the NTSP ~~[LTSP]~~, then the channel shall be 1 2
declared inoperable.

The second Note also requires that NTSP ~~[LTSP]~~ and the methodologies for 1 2
calculating the as-left and the as-found acceptance criteria bands ~~tolerances~~ be in the Technical Requirements Manual and Section 7.2 of the Updated Final Safety Analysis Report, respectively ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. 2

SR 3.3.4.5 2

This Surveillance ensures that the train actuation response times are the
maximum values assumed in the safety analyses. Individual component
response times are not modeled in the analyses. The analysis models
the overall or total elapsed time, from the point at which the parameter
exceeds the trip setpoint value at the sensor to the point at which the
equipment in both trains reaches the required functional state (e.g.,

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

pumps at rated discharge pressure, valves in full open or closed position). Response time testing acceptance criteria are included in Reference 5. The test may be performed in one measurement or in overlapping segments, with verification that all components are measured.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following TS Bases are applicable to plants adopting CEOG Topical Report CE NPSD-1167-1, "Elimination of Pressure Sensor Response Time Testing Requirements," and the methodology contained in Attachment 1 to TSTF-569.~~
~~--~~

2

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. ~~Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 12) provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. The response time may be verified for components that replace the components that were previously evaluated in Ref. 12 provided that the components have been evaluated in accordance with the NRC approved methodology as discussed in Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing," (Ref. 13). Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.~~

1

~~[ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every [18] months. This results in the interval between successive tests of a given channel of n x 18 months, where n is the number of channels in the Function. Surveillance of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. Therefore, staggered testing results in response time verification of these devices every [18] months. The [18] month STAGGERED TEST BASIS 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.~~

2

~~OR~~

3

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~----------REVIEWER'S NOTE----------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~----------]~~

REFERENCES

1. Technical Requirements Manual

2 ~~1~~. Regulatory Guide 1,105, "Setpoints for Safety-Related Instrumentation," Revision 3.

3 ~~2~~. 10 CFR 50, Appendix A.

4 ~~3~~. 10 CFR 100. 50.67

5 ~~4~~. U FSAR, Section ~~[~~7.3~~]~~.

~~5. NRC Safety Evaluation Report, [Date].~~

6. IEEE Standard 279-1971.

7. U FSAR, Chapter ~~[14]~~ 15.

8. 10 CFR 50.49.

9. IC-3.17, FPL Setpoint Standard. ~~"Plant Protection System Selection of Trip Setpoint Values."~~

~~10. FSAR, Section [7.2].~~

~~11. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

~~12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."~~

~~13.~~ Attachment 1 to TSTF-569, "Methodology to Eliminate Pressure ~~Sensor and Protection Channel (for Westinghouse Plants only) Response Time Testing."~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3, BASES, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.4 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

4. PSL does not use the terms “as-found tolerance” and “Limiting Trip Setpoint (LTSP)” in plant specific instrument calculations or the Updated Final Safety Analysis Report. Therefore, the use of these terms in Footnotes (a) and (b) in ISTS Table 3.3.1-1 are revised in the ITS to include the plant specific terminology. To comply with the guidance provided in NRC Regulatory Issue Summary 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” the PSL setpoint calculations have been structured to include a Nominal Trip Setpoint (NTSP), also known as the field trip setpoint, and determination of an OPERABILITY limit range, referred to in CTS as acceptance criteria band. For PSL, the Nominal Trip Setpoint (NTSP) is synonymous with the Limiting Trip Setpoint (LTSP) and the as-found acceptance criteria band (i.e., OPERABILITY limit range) is synonymous with the as-found tolerance.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.3, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 4

3.3.4, ESFAS LOGIC AND MANUAL ACTUATION

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.4
Table 3.3.4-1

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

LCO 3.3.4
Table 3.3.4-1

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Table 3.3.4-1

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTIONS for associated Table 3.3.4-1 Functions 1-6

ACTIONS for associated Table 3.3.4-1 Functions 1-6

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1
SR 3.3.4.2

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes ~~and at the frequencies~~ shown in Table 4.3-2.

In accordance with the Surveillance Frequency Control Program

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

See ITS 3.3.3

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. Each test shall include at least one channel per function.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	1. SAFETY INJECTION (SIAS)						
ACTION E, F	a. Manual (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	8	
	b. Containment Pressure – High	4	2	3	1, 2, 3	9	See ITS 3.3.3
	c. Pressurizer Pressure – Low	4	2	3	1, 2, 3(a)	9	
ACTION E, F	Add: Automatic Actuation Logic			2	1,2,3,4	ACTION E, F	L02 A03 L05
	2. CONTAINMENT SPRAY (CSAS)						
ACTION E, F	a. Manual (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	8	
	b. Containment Pressure – High-High	4	2(b)	3	1, 2, 3	10A, 10B	See ITS 3.3.3
ACTION E, F	Add: Automatic Actuation Logic			2	1,2,3,4	ACTION E, F	L02 A03 L05
	3. CONTAINMENT ISOLATION (CIS)						
ACTION E, F	a. Manual (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	8	
	b. Containment Pressure – High	4	2	3	1, 2, 3	9	See ITS 3.3.3
	c. Containment Radiation – High	4	2	3	1, 2, 3, 4	9	
	d. SIAS	---------- (See Functional Unit 1 above) ----------					
ACTION E, F	Add: Automatic Actuation Logic			2	1,2,3,4	ACTION E, F	L02 A03 L05
	4. MAIN STEAM LINE ISOLATION (MSIS)						
ACTION C, D	a. Manual (Trip Buttons)	~~2/steam generator~~	~~1/steam generator~~	2~~/operating steam generator~~	1, 2(a), 3(a)~~, 4~~	C, D ~~8~~	L01 A05
	b. Steam Generator Pressure – Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3(c)	9	See ITS 3.3.3
ACTION C, D	Add: Automatic Actuation Logic			2	1,2(a),3(a)	ACTION C, D	L02 A03 L05

(a) except when all MSIVs are closed

L01

A01

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01 A02

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
5. CONTAINMENT SUMP RECIRCULATION (RAS)						
a. Manual RAS (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	8	
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	13	
ACTION E, F — Add: Automatic Actuation Logic			2	1,2,3,4	ACTION E, F	L02 A03 L05
6. LOSS OF POWER						
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	See ITS 3.3.5
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	
c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	12	
7. AUXILIARY FEEDWATER (AFAS)						
ACTION A, B — a. Manual (Trip Buttons)	~~4/SG~~	~~2/SG~~	~~4~~ 2/SG	1, 2, 3	11	A05
ACTION A, B — b. Automatic Actuation Logic	~~4/SG~~	~~2/SG~~	~~3~~ 2/SG	1, 2, 3	11	
c. SG Level (1A/1B) - Low	4/SG	2/SG	3/SG	1, 2, 3	14a, 14b, 15	
8. AUXILIARY FEEDWATER ISOLATION						
a. SG 1A – SG 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	14a, 14b, 15	See ITS 3.3.3
b. Feedwater Header 1A – 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	14a, 15	

TABLE 3.3-3 (Continued)

TABLE NOTATION

(a) Trip function may be bypassed in this MODE when pressurizer pressure is < 1725 psia; bypass shall be automatically removed when pressurizer pressure is $\geq$ 1725 psia.

(b) An SIAS signal is first necessary to enable CSAS logic.

(c) Trip function may be bypassed in this MODE below 685 psig; bypass shall be automatically removed at or above 685 psig.

See ITS 3.3.3

Add proposed LCO 3.3.4 ACTIONS Note A06

Add proposed LCO 3.3.4 ACTIONS C and D L02

ACTION STATEMENTS

One or more Functions with one Manual Actuation or Actuation Logic channel inoperable except AFAS and MSIS.

ACTION E

ACTION F

ACTION 8 - ~~With the number of OPERABLE channels one less than the Total Number of Channels,~~ restore ~~the inoperable~~ channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in ~~at least HOT STANDBY~~ MODE 3 within ~~the next~~ 6 hours and ~~in COLD SHUTDOWN~~ MODE 5 within ~~the following~~ ~~30~~ 36 hours.

Add proposed ACTION F Condition: One or more Functions with two Manual Actuation or Actuation Logic channels inoperable except AFAS and MSIS. A04

ACTION 9 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of OPERABILITY; however, the inoperable channel shall then be either restored to OPERABLE status or placed in the tripped condition.

b. Within one hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

See ITS 3.3.3

TABLE 3.3-3 (continued)

TABLE NOTATION

ACTION 10A - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

See ITS 3.3.3

a. The inoperable channel is placed in the bypassed or tripped condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour. If the inoperable channel can not be restored to OPERABLE status within 48 hours, then place the inoperable channel in the tripped condition.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

ACTION 10B - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) Manual Actuation or Actuation Logic channel inoperable.

ACTION A

ACTION 11 - ~~With the number of OPERABLE channels one less than the Total Number of Channels,~~ restore ~~the inoperable~~ channel~~s~~ to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and ~~in HOT SHUTDOWN~~ MODE 4 within ~~the following~~ 12 ~~6~~ hours. ~~LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.~~

ACTION B

A07

ACTION 12 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

See ITS 3.3.5

Add proposed ACTION B Condition: Two AFAS Manual Actuation or Actuation Logic channels inoperable.

A04

TABLE 3.3-3 (continued)

TABLE NOTATION

See ITS 3.3.3

ACTION 13 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If OPERABILITY cannot be restored within 48 hours or in accordance with the Risk Informed Completion Time Program, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

ACTION 14 - With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If an inoperable SG level channel can not be restored to OPERABLE status within 48 hours, then AFAS-1 or AFAS-2 as applicable in the inoperable channel shall be placed in the bypassed condition. If an inoperable SG DP or FW Header DP channel can not be restored to OPERABLE status within 48 hours, then both AFAS-1 and AFAS-2 in the inoperable channel shall be placed in the bypassed condition. The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

ACTION 15 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES	
1. SAFETY INJECTION (SIAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Containment Pressure – High	≤ 5 psig	≤ 5 psig	See ITS 3.3.3
c. Pressurizer Pressure – Low	≥ 1600 psia	≥ 1600 psia	
2. CONTAINMENT SPRAY (CSAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Containment Pressure – High-High	≤ 10 psig	≤ 10 psig	See ITS 3.3.3
3. CONTAINMENT ISOLATION (CIS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Containment Pressure – High	≤ 5 psig	≤ 5 psig	See ITS 3.3.3
c. Containment Radiation – High	≤ 10 R/hr	≤ 10 R/hr	
d. SIAS	------------------------(See FUNCTIONAL UNIT 1 above)----------------------		
4. MAIN STEAM LINE ISOLATION (MSIS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Steam Generator Pressure – Low	≥ 585 psig	≥ 585 psig	See ITS 3.3.3
5. CONTAINMENT SUMP RECIRCULATION (RAS)			
~~a. Manual RAS (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Refueling Water Tank – Low	48 inches above tank bottom	48 inches above tank bottom	See ITS 3.3.3

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES	
6. LOSS OF POWER			
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	≥ 2900 volts with a 1 ± .5 second time delay	≥ 2900 volts with a 1 ± .5 second time delay	See ITS 3.3.5
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	≥ 3831 volts with a 18 ± 2 second time delay	≥ 3831 volts with a 18 ± 2 second time delay	
c. 480 volts Emergency Bus Undervoltage (Degraded Voltage)	≥ 415 volts with a ≤ 9 second time delay	≥ 415 volts with a ≤ 9 second time delay	
7. AUXILIARY FEEDWATER (AFAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
~~b. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
c. SG 1A & 1B Level Low	≥ 19.0%	≥ 18.0 %	
8. AUXILIARY FEEDWATER ISOLATION			See ITS 3.3.3
a. Steam Generator ΔP – High	≤ 275 psid	89.2 to 281 psid	
b. Feedwater Header High ΔP	≤ 150.0 psid	56.0 to 157.5 psid	

A01

~~DELETED~~

A01

~~DELETED~~

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
	1. SAFETY INJECTION (SIAS)					
SR 3.4.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	~~N.A.~~	
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Pressurizer Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.4.4.1	d. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1)	1, 2, 3	
	2. CONTAINMENT SPRAY (CSAS)					
SR 3.4.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	~~N.A.~~	
	b. Containment Pressure – –– High-High	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.4.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1)	1, 2, 3	
	3. CONTAINMENT ISOLATION (CIS)					
SR 3.4.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	~~N.A.~~	
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Containment Radiation – High	SFCP	SFCP	SFCP	1, 2, 3, 4	See ITS 3.3.3
SR 3.4.4.1	d. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1)	1, 2, 3	
	e. SIAS	N.A.	N.A.	SFCP	N.A.	See ITS 3.3.3
	4. MAIN STEAM LINE ISOLATION (MSIS)					
SR 3.4.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	~~N.A.~~	
	b. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.4.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1)	1, 2(a), 3(a)	L01
	5. CONTAINMENT SUMP RECIRCULATION (RAS)					
SR 3.4.4.2	a. Manual RAS (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	~~N.A.~~	
	b. Refueling Water Storage Tank – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.4.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1)	1, 2, 3	

(a) except when all MSIVs are closed

L01

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
	6. LOSS OF POWER					
	a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
	b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
	c. 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.5
	7. AUXILIARY FEEDWATER (AFAS)					
SR 3.4.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3	
	b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.4.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3	
	8. AUXILIARY FEEDWATER ISOLATION					
	a. SG Level (A/B) – Low and SG Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	

A01

TABLE 4.3-2 (Continued)

TABLE NOTATION

~~(1) The logic circuits shall be tested manually in accordance with the Surveillance Frequency Control Program.~~ LA02

Add SR 3.3.4.1 Note 1 A08

Add SR 3.3.4.1 Note 2 L03

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.4
Table 3.3.4-1

3.3.2 The Engineered Safety Features Actuation System (ESFAS) instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

LCO 3.3.4
Table 3.3.4-1

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Table 3.3.4-1

ACTIONS for
Table 3.3.4-1 Functions 1-6

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTIONS for
Table 3.3.4-1 Functions 1-6

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1
SR 3.3.4.2

~~4.3.2.1~~ Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES ~~and at the frequencies~~ shown in Table 4.3-2.

In accordance with the Surveillance Frequency Control Program

4.3.2.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.2.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. Each test shall include at least one channel per function.

See
ITS 3.3.3

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	1. SAFETY INJECTION (SIAS)						
ACTION E, F	a. Manual (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	12	
	b. Containment Pressure – High	4	2	3	1, 2, 3	13, 14	See ITS 3.3.3
	c. Pressurizer Pressure – Low	4	2	3	1, 2, 3(a)	13, 14	
ACTION E, F	d. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	12	
	2. CONTAINMENT SPRAY (CSAS)						
ACTION E, F	a. Manual (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	12	
	b. Containment Pressure – High-High	4	2	3	1(b), 2(b), 3(b)	18A, 18B	See ITS 3.3.3
ACTION E, F	c. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	12	
	3. CONTAINMENT ISOLATION (CIAS)						
ACTION E, F	a. Manual CIAS (Trip Buttons)	~~2~~	~~1~~	2	1, 2, 3, 4	12	
	b. Safety Injection (SIAS)	See Functional Unit 1 for all Safety Injection Initiating Functions and Requirements					
	c. Containment Pressure – High	4	2	3	1, 2, 3	13, 14	See ITS 3.3.3
	d. Containment Radiation – High	4	2	3	1, 2, 3	13, 14	
ACTION E, F	e. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	12	

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
	4. MAIN STEAM LINE ISOLATION (MSIS)						L01
ACTION C, D	a. Manual (Trip Buttons)	2	1	2	1, 2(a), 3(a)	16	
	b. Steam Generator Pressure – Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3(c)	13, 14	See ITS 3.3.3
	c. Containment Pressure – High	4	2	3	1, 2, 3	13, 14	
ACTION C, D	d. Automatic Actuation Logic	2	1	2	1, 2(a), 3(a)	12	L01
	5. CONTAINMENT SUMP RECIRCULATION (RAS)						
ACTION E, F	a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	12	
	b. Refueling Water Tank - Low	4	2	3	1, 2, 3	19	See ITS 3.3.3
ACTION E, F	c. Automatic Actuation Logic	2	1	2	1, 2, 3	12	

(a) except when all MSIVs are closed

L01

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA01
A02

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. LOSS OF POWER (LOV)					
a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	2/Bus	2/Bus	1/Bus	1, 2, 3	17A
(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B
b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B
(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	3/Bus	2/Bus	2/Bus	1, 2, 3	17B
7. AUXILIARY FEEDWATER (AFAS)					
ACTION A, B a. Manual (Trip Buttons)	~~4/SG~~	~~2/SG~~	4/SG	1, 2, 3	15
ACTION A, B b. Automatic Actuation Logic	~~4/SG~~	~~2/SG~~	~~3~~/SG	1, 2, 3	15
c. SG Level (2A/2B) – Low	4/SG	2/SG	3/SG	1, 2, 3	20a, 20b, 21
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 2A – SG 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	20a, 20b, 21
b. Feedwater Header 2A – 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	20a, 21

See ITS 3.3.5 (Item 6)

See ITS 3.3.3 (Items 7.c and 8)

TABLE 3.3-3 (Continued)

TABLE NOTATION

(a) Trip function may be bypassed in this MODE when pressurizer pressure is less than 1836 psia; bypass shall be automatically removed when pressurizer pressure is greater than or equal to 1836 psia.

(b) An SIAS signal is first necessary to enable CSAS logic.

(c) Trip function may be bypassed in this MODE below 700 psia; bypass shall be automatically removed at or above 700 psia.

See ITS 3.3.3

Add proposed LCO 3.4.4 ACTIONS Note A06

ACTION OF STATEMENTS

One or more Functions with one Manual Actuation or Actuation Logic channel inoperable except AFAS and MSIS.

ACTION E

ACTION F

ACTION 12 - ~~With the number of OPERABLE channels one less than the Total Number of Channels,~~ restore ~~the inoperable~~ channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in ~~at least~~ ~~HOT STANDBY~~ MODE 3 within ~~the next~~ 6 hours and ~~in COLD SHUTDOWN~~ MODE 5 within ~~the following~~ ~~30~~ 36 hours.

`

ACTION 13 - With the number of channels OPERABLE one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below.

See ITS 3.3.3

Process Measurement Circuit	Functional Unit Bypassed
1. Containment Pressure -	Containment Pressure – High (SIAS, CIAS, CSAS) Containment Pressure – High (RPS)
2. Steam Generator Pressure -	Steam Generator Pressure – Low (MSIS) AFAS-1 and AFAS-2 (AFAS) Thermal Margin/Low Pressure (RPS) Steam Generator Pressure – Low (RPS)
3. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)
4. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Pressurizer Pressure – Low (SIAS) Thermal Margin/Low Pressure (RPS)

A01

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 14 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

See ITS 3.3.3

a. Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour.

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below.

Process Measurement Circuit	**Functional Unit Bypassed/Tripped**
1. Containment Pressure -	Containment Pressure – High (SIAS, CIAS, CSAS) Containment Pressure – High (RPS)
2. Steam Generator Pressure -	Steam Generator Pressure – Low (MSIS) AFAS-1 and AFAS-2 (AFAS) Thermal Margin/Low Pressure (RPS) Steam Generator Pressure – Low (RPS)
3. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)
4. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Pressurizer Pressure – Low (SIAS) Th

One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) Manual Actuation or Actuation Logic channel inoperable.

ACTION A

ACTION 15 - ~~With the number of OPERABLE channels one less than the Total Number of Channels,~~ restore ~~the inoperable~~ channel~~s~~ to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in ~~at least HOT STANDBY~~ MODE 3 within 6 hours and ~~in HOT SHUTDOWN~~ MODE 4 within ~~the following 6~~ 12 hours. ~~LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.~~

ACTION B

ACTION B.2 Note

A07

ACTION C.1

ACTION 16 - ~~With the number of OPERABLE channels one less than the Total Number of Channels,~~ restore ~~the inoperable~~ channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program ~~declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5~~.

Add ACTION D

L03 A03

L04

One Main Steam Isolation Signal (MSIS) Manual Actuation or Actuation Logic channel inoperable.

ACTION 17A - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or place the inoperable channel in the tripped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

See ITS 3.3.5

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 17B - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or place the inoperable channel in the tripped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

See ITS 3.3.5

ACTION 18A - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

See ITS 3.3.3

a. The inoperable channel is placed in either the bypassed or tripped condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour. If the inoperable channel can not be restored to OPERABLE status within 48 hours, then place the inoperable channel in the tripped condition.

b. With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed in ACTION 13.

ACTION 18B - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 19 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. Within 1 hour the inoperable channel is placed in either the bypassed or tripped condition. If OPERABILITY cannot be restored within 48 hours or in accordance with the Risk Informed Completion Time Program, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

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TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 20 - With the number of channels OPERABLE one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

See ITS 3.3.3

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. If an inoperable SG level channel can not be restored to OPERABLE status within 48 hours, then AFAS-1 or AFAS-2 as applicable in the inoperable channel shall be placed in the bypassed condition. If an inoperable SG DP or FW Header DP channel can not be restored to OPERABLE status within 48 hours, then both AFAS-1 and AFAS-2 in the inoperable channel shall be placed in the bypassed condition. The channel shall be returned to OPERABLE status no later than during the next COLD SHUTDOWN.

b With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed in ACTION 13.

ACTION 21 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

TABLE 3.3-4

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES	
1. SAFETY INJECTION (SIAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Containment Pressure – High	≤ 3.5 psig	≤ 3.6 psig	See ITS 3.3.3
c. Pressurizer Pressure – Low	≥ 1736 psia	≥ 1728 psia	
~~d. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
2. CONTAINMENT SPRAY (CSAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Containment Pressure – High-High	≤ 5.40 psig	≤ 5.50 psig	See ITS 3.3.3
~~c. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
3. CONTAINMENT ISOLATION (CIAS)			
~~a. Manual CIAS (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Safety Injection (SIAS)	Not Applicable	Not Applicable	
c. Containment Pressure – High	≤ 3.5 psig	≤ 3.6 psig	See ITS 3.3.3
d. Containment Radiation – High	≤ 10 R/hr	≤ 10 R/hr	
~~e. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
4. MAIN STEAM LINE ISOLATION			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Steam Generator Pressure – Low	≥ 600 psia	≥ 567 psia	See ITS 3.3.3
c. Containment Pressure – High	≤ 3.5 psig	≤ 3.6 psig	
~~d. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES	
5. CONTAINMENT SUMP RECIRCULATION (RAS)			
~~a. Manual RAS (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
b. Refueling Water Tank – Low	5.67 feet above tank bottom	4.62 feet to 6.24 feet above tank bottom	See ITS 3.3.3
~~c. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
6. LOSS OF POWER			
a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	$\geq$ 3120 volts	$\geq$ 3120 volts	
(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	$\geq$ 360 volts	$\geq$ 360 volts	See ITS 3.3.5
b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	$\geq$ 3848 volts with < 10-second time delay	$\geq$ 3848 volts with < 10-second time delay	
(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	$\geq$ 432 volts	$\geq$ 432 volts	
7. AUXILIARY FEEDWATER (AFAS)			
~~a. Manual (Trip Buttons)~~	~~Not Applicable~~	~~Not Applicable~~	
~~b. Automatic Actuation Logic~~	~~Not Applicable~~	~~Not Applicable~~	
c. SG 2A & 2B Level Low	$\geq$ 19.0%	$\geq$ 18.0 %	
8. AUXILIARY FEEDWATER ISOLATION			
a. Steam Generator ΔP – High	$\leq$ 275 psid	89.2 to 281 psid	See ITS 3.3.3
b. Feedwater Header ΔP – High	$\leq$ 150.0 psid	56.0 to 157.5 psid	

A01

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TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
SR 3.3.4.2	1. SAFETY INJECTION (SIAS)					
	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3, 4	
	b. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Pressurizer Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.4.1	d. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(3)	1, 2, 3, 4	
	2. CONTAINMENT SPRAY (CSAS)					
SR 3.3.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3, 4	
	b. Containment Pressure – High-High	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.3.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(3)	1, 2, 3, 4	
	3. CONTAINMENT ISOLATION (CIAS)					
SR 3.3.4.2	a. Manual CIAS (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3, 4	
	b. Safety Injection SIAS	N.A.	N.A.	SFCP	1, 2, 3, 4	See ITS 3.3.3
	c. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
	d. Containment Radiation – High	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.4.1	e. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(3)	1, 2, 3, 4	
	4. MAIN STEAM LINE ISOLATION				(a) (a)	L01
SR 3.3.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3	
	b. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.4.1	d. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(3)	1, 2, 3, ~~4~~	
	5. CONTAINMENT SUMP RECIRCULATION (RAS)					
SR 3.3.4.2	a. Manual RAS (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	N.A.	
	b. Refueling Water Tank – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.3.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(3)	1, 2, 3	

(a) except when all MSIVs are closed

L01

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	6. LOSS OF POWER (LOV)					
	a. 4.16 kV and 480 V Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	See ITS 3.3.3
	b. 4.16 kV and 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	
	7. AUXILIARY FEEDWATER (AFAS)					
SR 3.3.4.2	a. Manual (Trip Buttons)	~~N.A.~~	~~N.A.~~	SFCP	1, 2, 3	
	b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
SR 3.3.4.1	c. Automatic Actuation Logic	~~N.A.~~	~~N.A.~~	SFCP(1), SFCP(2)	1, 2, 3	
	8. AUXILIARY FEEDWATER ISOLATION					
	a. SG Level (A/B) – Low and SG Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	

TABLE NOTATION

SR 3.3.4.1 Note ~~(1)~~ Testing of Automatic Actuation Logic shall include energization/de-energization of each initiation relay (solid-state component) and verification of the OPERABILITY of each initiation relay (solid-state component).

~~(2) An actuation relay test shall be performed which shall include the energization/de-energization of each actuation relay and verification of the OPERABILITY of each actuation relay.~~ LA02

~~(3) A subgroup relay test shall be performed which shall include the energization/de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay. Testing of the ESFAS subgroup relays shall be performed in accordance with the Surveillance Frequency Control Program.~~ LA02

Add SR 3.3.4.1 Note 2 L03

DISCUSSION OF CHANGES
ITS 3.3.4, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS)
LOGIC AND MANUAL ACTUATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2, Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications-Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 specify requirements for ESFAS instrumentation and list the requirements for each functional unit in CTS Tables 3.3-3, 3.3-4, and 4.3-2, including the manual channels and automatic actuation logic (Unit 2 only). ITS 3.3.4 provides requirements for the ESFAS Actuation Logic and Manual Actuation channels and provides the requirements in the LCO, Applicability, ACTIONS, and Surveillance Requirements. Additionally, ITS Table 3.3.4-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. DOC LA01 describes the change that moves the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases. This changes the CTS by moving the "MINIMUM CHANNELS OPERABLE" requirements to the LCO statement and reformatting the content consistent with the ISTS. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 **Unit 1 only:** CTS Table 3.3-3 Functional Unit 1 (SIAS), Functional Unit 2 (CSAS), Functional Unit 3 (CIS), Functional Unit 4 (MSIS) and Functional Unit 5 (RAS) do not specifically include the Automatic Actuation Logic and Actuation Relay Function. However, CTS Table 4.3-2 list Surveillance Requirements for the ESFAS automatic actuation logic associated with these Functions. Therefore, per the requirements of CTS 4.0.1 (ITS SR 3.0.1), CTS 3.3.2.1 encompasses the ESFAS automatic actuation logic. ITS LCO 3.3.4 requires two ESFAS Actuation Logic channels to be OPERABLE in the MODES specified for each Function. This changes the CTS by explicitly requiring two channels of the ESFAS Actuation Logic Functions for SIAS, CSAS, CIS, MSIS, and RAS to be OPERABLE.

This change is considered acceptable because the SIAS, CSAS, CIS, MSIS and RAS Functions require the Actuation Logic channels to operate properly in order to actuate the associated function response. Two channels are required to be OPERABLE to ensure a single failure of a logic channel does not prevent the actuation of the associated SIAS, CSAS, CIS, MSIS or RAS function response. The proposed Applicability is consistent with the Applicability of the Functions listed under CTS Table 3.3-3 Functional Units 1.a, 2.a, 3.a, 5.a and 4.a as modified by DOC L02. This change is designated as administrative because it does not result in a technical change to the CTS.

A04 Unit 1 CTS 3.3.2.1 does not currently contain an ACTION when two Manual Actuation channels are inoperable and Unit 2 CTS 3.3.2 does not currently contain an ACTION when two Manual Actuation or Actuation Logic channels are inoperable; therefore, an LCO 3.0.3 entry would be required. ITS 3.3.4 ACTION B requires the unit to be in MODE 3 in 6 hours and MODE 4 in 12 hours when two Auxiliary Feedwater Actuation Signal (AFAS) Manual Actuation or Actuation Logic channels are inoperable. ITS 3.3.4 ACTION F requires the unit to be in MODE 3 in 6 hours and MODE 5 in 36 hours when either two Safety Injection Actuation Signal (SIAS), two Containment Spray actuation Signal (CSAS), two Containment Isolation Signal (CIS – Unit 1), two Containment Isolation Actuation Signal (CIAS – Unit 2), or two Containment Sump Recirculation Actuation Signal (RAS) Manual Actuation or Actuation Logic channels are inoperable. This changes the CTS by explicitly stating shutdown ACTIONS when two Manual Actuation or Actuation Logic channels are inoperable for an ESFAS Function.

The purpose of ITS 3.3.4 ACTIONS B, and F when two Manual Actuation or Actuation Logic channels are inoperable, is to ensure the plant is brought to a MODE in which the LCO for the ESFAS Functions does not apply within a reasonable amount of time in a controlled manner. Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.3.2 are silent on these actions, deferring to CTS 3.0.3 for the actions to accomplish this. The proposed change is acceptable because the ACTIONS specified in ITS 3.3.4 adopt ISTS structure for placing the unit outside the MODE of Applicability without changing the time specified to enter MODE 3, MODE 4, or MODE 5, as applicable. This change is designated as administrative because it does not result in a technical change to the CTS.

A05 **Unit 1 only:** CTS Table 3.3-3 Functional Unit 4.a provides requirements for MSIS manual actuation. The Total No. Of Channels and Minimum Channels Operable columns specify 2 channels per steam generator (SG) and the Channels to Trip column specifies 1 channel per SG. ITS LCO 3.3.4, in part, requires two channels of ESFAS Manual Actuation for each Function listed in Table 3.3.4-1 to be OPERABLE, which includes the main steam isolation signal (MSIS) Function. This changes the CTS by requiring two MSIS Manual Actuation channels instead of two channels per SG.

The purpose of the required number of channels is to ensure a manual MSIS trip can be initiated coincident with a single failure. The MSIS manual actuation function is comprised of one manual actuation push button per MSIS actuation logic. A single pushbutton associated with either Manual Actuation channel is required to initiate an isolation of both MSIVs. Each Manual Actuation channel actuates its associated MSIS Actuation Logic channel and each MSIS Actuation Logic channel provides a signal to both MSIVs via interposing relays. CTS Table 3.3-3 Functional Unit 4.a specifies each logic input to each MSIV as a Manual Actuation channel (i.e., two Manual Actuation channels to each SG). ISTS LCO 3.3.5 (ITS LCO 3.3.4) and the associated ACTIONS and Surveillances are formatted to address each individual manual actuation push button circuit to the MSIS logic channel as a channel. Actuating either MSIS Manual Actuation will result in a full main steam isolation. Therefore, changing the minimum number of required channels from 2 per steam generator to 2 results in an equivalent requirement; two manual push buttons must be OPERABLE and one manual push button is required to initiate a main steam isolation.

This change is a presentation preference is consistent with NUREG-1432, Rev. 5 and PSL Unit 2 CTS Table 3.3-1 Functional Unit 1 Total No. of Channels, Minimum Channels Operable, and Channels to Trip columns. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 CTS Table 3.3-3 Actions describe the Actions to be taken when ESFAS Function manual actuations or actuation logic channels are inoperable. ITS 3.3.4 also describes Actions to be taken when ESFAS Function manual actuations or actuation logic channels are inoperable and contains a note that separate condition entry is allowed for each ESFAS Function. This changes the CTS by adding a Note stating that separate condition entry is allowed for each ESFAS Function, those Functions being the SIAS, CSAS, CIS (Unit 1) and CIAS (Unit 2), MSIS, RAS, and AFAS Functions.

The purpose of the CTS Actions is to provide the appropriate compensatory actions for inoperable ESFAS Functions. This proposed change will allow separate condition entry for each ESFAS Function. The Note clarifies that ESFAS Functions are treated as separate entities, each with separate Completion Times. This change is acceptable because it clearly states the current requirement. The CTS considers each ESFAS Function to be separate and independent from the others including on a per steam generator basis. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 Unit 1 CTS Table 3.3-3 Action 11 and Unit 2 CTS Table 3.3-3 Action 15 describe the actions to be taken when one Manual Actuation or Actuation Logic channel associated with an AFAS Functional Unit cannot be restored to OPERABLE status within the required Completion Time. ACTION 15 includes a statement that “LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.” ITS 3.3.4 ACTION B also describes actions to be taken when one Manual Actuation or Actuation Logic channel associated with an AFAS Function cannot be restored to OPERABLE status within the required Completion Time but does not include the CTS statement regarding LCO 3.0.4.a because the AFAS instrumentation is not applicable in HOT SHUTDOWN (MODE 4). This changes the CTS by eliminating a note that is unnecessary for Technical Specification compliance.

The purpose of the CTS Actions is to provide the appropriate compensatory actions for inoperable AFAS Functions. This CTS statement that LCO 3.0.4.a is not appliable when entering Hot Shutdown is unnecessary. The purpose of CTS 3.0.4 (ITS LCO 3.0.4) is to prohibit entry into a MODE or other specified condition in which the LCO is applicable when the LCO is not met except as allowed by LCO 3.0.4.a, b, or c. CTS Table 3.3-3 Action 11 (Unit 1) and Action 15 (Unit 2) are only related to the AFAS Functions (CTS Table 3.3-3 Functional Units 7.a and 7.b). These Functions are not applicable in MODE 4 (Hot Shutdown). Therefore, LCO 3.0.4 does not apply to the AFAS Functions when in MODE 4 resulting in the statement related to LCO 3.0.4.a not being applicable meaningless. This change is designated as administrative because it removes a requirement that serves no purpose and does not result in technical changes to the CTS.

A08 **Unit 1 only:** CTS Table 4.3-2 requires CHANNEL FUNCTIONAL TEST requirements for each ESFAS Functional Unit, including ESFAS automatic actuation logic channels. ITS SR 3.3.4.1 also requires a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel and includes a Note (Note 1) that states, “Testing of Actuation Logic shall include verification of the proper operation of each initiation relay.” The added Note is consistent with the ISTS. This changes the CTS by explicitly stating that proper operation of each initiation relay is required to satisfy the CHANNEL FUNCTIONAL TEST requirement.

The purpose of the additional Note is to explicitly clarify the intent of the CHANNEL FUNCTIONAL TEST to include the initiation relays of the equipment. CTS 1.6 definition of a CHANNEL FUNCTIONAL TEST requires the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and/or trip functions. Similarly, the ITS definition of a CHANNEL FUNCTIONAL TEST states, in part, “…the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of all devices in the channel required for channel OPERABILITY.” Although it is inferred by the definition of a CHANNEL FUNCTIONAL TEST that testing the associated initiation relays is required to verify logic OPERABILITY, Note 1 to SR 3.3.4.1 provides explicit clarification of the requirement. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.4-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS Table 4.3-2 contains Note (1) requiring, in part, that "logic circuits to be tested manually." Unit 2 CTS Table 4.3-2 contains Notes (2) and (3) modifying the Automatic Actuation Logic Channel Functional Test requirements. Note (2) requires an actuation relay test to be performed including the energization/de-energization of each actuation relay and verification of the OPERABILITY of each actuation relay. Note (3) requires a subgroup relay test to be performed including the energization/de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay. ITS 3.3.4 does not retain these Notes, but rather, includes this testing procedural guidance in the ITS Bases. This changes the CTS by moving procedural details regarding testing to the Bases.

The purpose of the CTS Notes is to ensure the appropriate components are tested to demonstrate OPERABILITY of instrumentation actuation logic. The removal of these details, which are procedural details, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the CHANNEL FUNCTIONAL TEST requirement and the definition of a CHANNEL FUNCTIONAL TEST which ensures the appropriate components are tested to verify instrumentation OPERABILITY. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 (*Category 2 – Relaxation of Applicability*) Unit 1 CTS 3.3.2.1, Table 3.3-3 Functional Unit 4 – main steam isolation signal (MSIS) manual actuation is applicable in MODES 1, 2, 3, and 4 and Table 4.3-2 Functional Unit 4 – MSIS automatic actuation logic is applicable in MODES 1, 2, and 3. Unit 2 CTS 3.3.2, Tables 3.3-3 and 4.3-2 Functional Unit 4 –MSIS manual and automatic actuation logic are applicable in MODES 1, 2, and 3. When one MSIS manual actuation channel (or one automatic actuation logic channel for Unit 2) is inoperable, CTS Table 3.3-3 Action 8 (Unit 1) and Action 12 (Unit 2) require, in part, to restore the channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program.

ITS LCO 3.3.4 (Table 3.3.4-1) requires the MSIS manual actuation and automatic actuation channel to be OPERABLE in MODES 1, 2, and 3 except in MODES 2 and 3 when valves isolated by the MSIS Function are closed as specified in Footnote (a). Consistent with CTS, ITS 3.3.4 ACTION C requires restoring a channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program when one MSIS Manual Actuation or Actuation Logic channel is inoperable. However, ITS 3.3.4 ACTION D requires closing the main steam isolation valves (MSIVs) and the main feedwater isolation valves (MFIVs) in 6 hours, or be in MODE 3 in 6 hours and MODE 4 in 12 hours when two MSIS Manual Actuation or Actuation Logic channels are inoperable or when the action to restore one MSIS Manual Actuation or Actuation Logic channel cannot be completed within the required Completion Time. This changes the CTS by deleting the MODE 4 applicability requirement for Unit 1 MSIS, and changing the MODE 2 and 3 Applicability for Unit 1 and Unit 2 to include "except when valves isolated by the MSIS Function are closed." This change aligns the Applicability of the MSIS actuation instrumentation with the applicability requirements of the associated MSIS instrument channels (i.e., steam generator low pressure instrument channels and the Unit 2 containment high pressure instrument channels) and the supported equipment (i.e., the MSIVs and MFIVs). This change also revises the CTS Actions to add appropriate actions to reflect the change to the Applicability, which provides sufficient remedial actions to safely continue operation in lieu of a plant cooldown.

The purpose of the MSIS manual and automatic instrumentation in CTS Table 3.3-3 is to ensure the ESFAS MSIS Functions are OPERABLE when the supported equipment is required to be OPERABLE. Automatic steam line and feedwater line isolation is assumed in the mitigation of a major secondary system pipe rupture accident (e.g., main steam line break or feedwater line break). The MSIS manual actuation instrumentation is not credited in the safety analysis and a safety analysis limit is not specified for this actuation function. MSIS automatic actuation instrumentation is credited in the safety analysis.

In MODES 1, 2, and 3, there is sufficient energy in the primary and secondary systems to warrant automatic ESF System response to ensure the main steam and feedwater lines can be isolated in the event of a high energy secondary system pipe rupture. The exception to MODE 2 and 3 is added to clarify that the MSIS manual and automatic actuation instrumentation is not required to be OPERABLE when the valves actuated by the MSIS instrumentation are in positions that support the safety analyses. When the valves isolated by the MSIS function are in the closed position, they are in their assumed accident position. This change is acceptable, because when the MSIVs and MFIVs are closed, the adverse effects of a high energy secondary system pipe rupture are precluded and the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses. The proposed applicability and actions provide the same level of protection as the current requirements for the supported equipment.

Since the proposed actions provide the allowance to place the MSIVs and MFIVs in their accident position with the option to continue a plant cooldown, sufficient remedial measures continue to be provided to allow safe operation pursuant the requirements of 10 CFR 50.36(c)(2). Proposed ITS 3.3.4 ACTION D is acceptable because, if not restricted by plant operation, the action of closing the associated MSIVs and MFIVs isolates the affected secondary system line, which accomplishes the safety function of the inoperable MSIS manual and automatic actuation logic channel(s). This action is similar to the ACTIONS provided in ITS 3.7.2, “Main Steam Isolation Valves (MSIVs),” and ITS 3.7.3, “Main Feedwater Isolation Valves (MFIVs),” and may be preferable instead of placing the plant in an unnecessary plant cooldown transient. Alternately, if it is necessary to maintain the MSIVs and MFIVs open to support plant cooldown, the actions continue to allow the plant to be placed in MODE 3 within 6 hours and in MODE 4 within 12 hours consistent with the current time to reach these MODES in CTS 3.0.3 (ITS LCO 3.0.3) and the times used throughout the CTS and ITS to reach MODES 3 and 4. The Completion Time to close the associated MSIVs and MFIVs corresponds to the time to be in MODE 3. These Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. This change is designated as less restrictive because the ITS LCO requirements are applicable in fewer operating conditions than in the CTS.

L02 **Unit 1 only:** *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-3 Functional Unit 1 (SIAS), Functional Unit 2 (CSAS), Functional Unit 3 (CIS), Functional Unit 4 (MSIS) and Functional Unit 5 (RAS) do not specifically include requirements for the automatic actuation logic channels, including actions when one or more automatic actuation logic channels are inoperable. However, CTS Table 4.3-2 list Surveillance Requirements for the ESFAS automatic actuation logic associated with these Functions. Therefore, per the requirements of CTS 4.0.1 (ITS SR 3.0.1), CTS 3.3.2.1 encompasses the ESFAS automatic actuation logic. ITS LCO 3.3.4 requires the two automatic actuation logic channels to be OPERABLE in the MODES specified for each Function. Additionally, ITS 3.3.4 provides ACTIONS for one actuation logic channel inoperable and for two actuation logic channels inoperable. For CTS, if an automatic actuation channel is inoperable, CTS 3.0.3 is entered since there is no Condition and Action specified in the CTS. This changes the CTS by explicitly requiring the two ESFAS actuation logic channels be OPERABLE for each ESAFS Function and providing time to restore an automatic actuation channel to OPERABLE status when one channel (per Function) is inoperable. ITS ACTION C and ACTION E provide a Completion Time of 48 hours or in accordance with the Risk Informed Completion Time Program to restore an inoperable actuation logic channel to OPERABLE status before entry into ACTION D or F, respectively, which provide shutdown requirements. ACTION D requires the MSIVs and MFIVs be closed within 6 hours or be in MODE 3 within 6 hours and MODE 4 within 12 hours. ACTION F requires the unit be in MODE 3 within 6 hours and MODE 5 within 36 hours. This changes the CTS by providing specific ACTIONS to take when an actuation logic channel is inoperable before a shutdown ACTION is entered. CTS 3.0.3 requires the unit to be in MODE 5 within 37 hours from the time that one ESFAS actuation logic channel is discovered inoperable, whereas the ITS

ACTIONS allow a Completion Time of 48 hours or in accordance with the Risk Informed Completion Time Program to restore the inoperable actuation logic channel to OPERABLE status before a shutdown ACTION is required.

The purpose of ITS 3.3.4 ACTIONS C and E is to provide a period of time to restore an inoperable actuation logic channel to OPERABLE status and the purpose of ITS 3.3.4 ACTIONS D and F is to place the unit outside the Applicability of the ESFAS Function with the inoperable actuation logic channel. Currently, an inoperable automatic actuation logic channel requires entry into CTS 3.0.3 since no Action is provided for this case. CTS 3.0.3 allows 1 hour to initiate action, 7 hours for the unit to be placed in MODE 3, and 13 hours for the unit to be placed in MODE 4, and 37 hours for the unit to be in MODE 5.

ITS ACTION C and ACTION E provide a Completion Time of 48 hours or in accordance with the Risk Informed Completion Time Program to restore an inoperable actuation logic channel to OPERABLE status before entry into ACTION D or F, respectively. ACTION D requires the MSIVs and MFIVs closed within 6 hours or be in MODE 3 within 6 hours and MODE 4 within 12 hours. ACTION F requires the unit be in MODE 3 within 6 hours and MODE 5 within 36 hours. The proposed ACTIONS result in extending the time an ESFAS channel may be inoperable, which is less restrictive than the CTS 3.0.3 times of 13 hours for the unit to be placed in MODE 4, and 37 hours for the unit to be in MODE 5.

This change is considered acceptable because the SIAS, CSAS, CIS, MSIS and RAS Functions require the automatic actuation logic channels to operate properly in order to actuate the associated Function response. Two channels are required to be OPERABLE to ensure a single failure of a logic channel does not prevent the actuation of the associated SIAS, CSAS, CIS, MSIS or RAS Function response. The proposed Applicability is consistent with the Applicability of the Functions listed under CTS Table 3.3-3 Functional Units 1.a, 2.a, 3.a, 5.a and 4.a as modified by DOC L01. This change is designated as less restrictive because the ITS Actions are less restrictive than the CTS Actions

L03 (*Category 7 - Relaxation of Surveillance Frequency*) CTS Table 4.3-2 requires CHANNEL FUNCTIONAL TEST requirements for each ESFAS Functional Unit, including ESFAS automatic actuation logic channels. ITS SR 3.3.4.1 also requires a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel and includes a Note (Note 2) that states, "Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months." This changes the CTS by providing allowance to test components required to satisfy the CHANNEL FUNCTIONAL TEST at a frequency other than the frequency specified in accordance with the Surveillance Frequency Control Program.

The purpose of the additional Note is to allow certain components required to satisfy the CHANNEL FUNCTIONAL TEST to be tested during plant shutdown conditions. The allowance is necessary to allow for the fact that operating certain relays during power operation could cause plant transients or equipment damage. This change is acceptable because during plant operation actuation of certain systems and components could result in a plant transient. For example, isolation of the Component Cooling Water System valves to and from the reactor coolant pumps or closure of the MSIVs and feedwater isolation valves. Appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function and assure that the necessary quality of systems and components is maintained, and that facility operation will be within safety limits. Additionally, the relaxation of the testing frequency is offset by reducing the likelihood of a plant transient as a result of testing certain actuating relays during at-power conditions. This change is also consistent with Note 2 in ISTS SR 3.3.5.1. This change is designated as less restrictive because portions of the Surveillance will be performed less frequently under the ITS than under the CTS.

L04 **Unit 2 only**: (*Category 4 – Relaxation of Required Action*) When one MSIS manual trip button channel is inoperable, CTS Table 3.3-3 Action 16 requires the channel to be restored to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5 (i.e., Main Steam Line Isolation Valves Specification). ITS 3.3.4 ACTION C requires restoring a channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program. This changes the CTS by optionally allowing the manual channel to be restored in accordance with the Risk Informed Completion Time (RICT) Program and eliminating the requirement to declare the associated valve inoperable and take ACTION required by the supported system Specification. This change aligns the action for one inoperable Unit 2 MSIS manual channel with the action for one inoperable Unit 1 MSIS manual channel and an inoperable channel for the other ESFAS manual actuation channels.

The purpose of the actions associated with the MSIS manual actuation instrumentation in CTS Table 3.3-3 is to ensure sufficient remedial measures are provided to allow safe operation pursuant the requirements of 10 CFR 50.36(c)(2). Automatic steam line and feedwater line isolation is assumed in the mitigation of a major secondary system pipe rupture accident (e.g., main steam line break (MSLB) or feedwater line break (FWLB)). The consequences of a MSLB inside containment bounds the consequences of a FWLB accident. This change is acceptable because, in part, the MSIS manual actuation instrumentation is not credited in the safety analysis and a safety analysis limit is not specified for this actuation function. This change is also acceptable considering redundant manual actuation logic channels are available to ensure the required equipment supported by the MSIS (i.e., MSIVs and MFIVs) will be capable of actuating, diverse automatic actuation channels are available, and a Completion Time beyond 48 hours will be evaluated, and the risk managed in accordance with the RICT Program. Extending the time to restore a single ESFAS manual actuation channel to OPERABLE status has been previously evaluated and approved by the NRC for the other ESFAS manual channels and the Unit 1 ESFAS manual channels, including the Unit 1 MSIS manual channel. In the NRC safety evaluation (SE) accompanying PSL Unit 2 License Amendment 199 (RICT Amendment), dated July 2, 2019, (NRC ADAMS Accession No. ML19113A099) the NRC concluded that the proposed RICT for the manual ESFAS channels does not impede accomplishing their safety function and does not alter the existing diversity of the affected functions. The NRC staff stated that the change is consistent with the defense-in-depth philosophy, and therefore acceptable. The acceptability was based, in part, on confirmation that more than one diverse means existed to accomplish the safety function for each identified accident condition, as indicated in the Tables provided in FPL to NRC supplement letter, "Fourth Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b,'" dated March 15, 2018 (NRC ADAMS Accession No. ML18074A116). Tables 2 and 4 of the supplement letter provided the Instrumentation Diversity for each Unit 1 and Unit 2 ESFAS Instrument Function, respectively. As indicated in Table 4 of the RICT supplement letter, ESFAS diversity for the MSIS manual actuation instrumentation is provided by the Steam Generator Pressure – Low Function for a MSLB outside containment. ESFAS diversity for the MSIS manual actuation instrumentation for a MSLB inside containment is provided by the Steam Generator Pressure – Low Function and the Containment Pressure – High Function. This diversity is equivalent or better than the diversity for the Unit 1 MSIS manual actuation instrumentation, which has been approved to restore one inoperable channel to OPERABLE status in accordance with the RICT Program.

The NRC-approved RICT Program required by CTS 6.8.4.s (ITS 5.5.17) provides controls to calculate a RICT as implemented in accordance with NEI 06-09-A, Revision 0, "Risk-Managed Technical Specifications (RMTS) Guidelines." In the NRC SE accompanying the RICT Amendment, the NRC found that the PSL PRA maintenance and change process ensures that the configuration risk management program models used in the RICT calculations will continue to use PRA methods acceptable to the NRC and that the PRA model will be updated as necessary to reflect the as-built and as-operated plant. The NRC also found that appropriate programmatic and procedural controls for the RICT Program are consistent with the guidance of NEI 06-09, Revision 0-A. Therefore, use of the RICT Program specified in the Technical Specifications to determine a RICT to restore an inoperable MSIS manual actuation channel is acceptable.

Based on the considerations described herein, the change to the actions associated with one inoperable MSIS manual actuation channel continues to provide sufficient remedial measures to allow safe operation pursuant the requirements of 10 CFR 50.36(c)(2). This change is designated as less restrictive because the ITS Actions are less restrictive than the CTS Actions.

L05 **Unit 1 only**: (*Category 4 – Relaxation of Required Action*) CTS Table 3.3-3 Functional Unit 1 (SIAS), Functional Unit 2 (CSAS), Functional Unit 3 (CIS), Functional Unit 4 (MSIS) and Functional Unit 5 (RAS) do not specifically include requirements for the automatic actuation logic channels, including actions when one or more automatic actuation logic channels are inoperable. However, CTS Table 4.3-2 list Surveillance Requirements for the ESFAS automatic actuation logic associated with these Functions. Therefore, per the requirements of CTS 4.0.1 (ITS SR 3.0.1), CTS 3.3.2.1 encompasses the ESFAS automatic actuation logic. ITS LCO 3.3.4 requires the two automatic actuation logic channels to be OPERABLE in the MODES specified for each Function. Additionally, ITS 3.3.4

provides ACTIONS for inoperable actuation logic channels. For CTS, if an automatic actuation channel is inoperable, CTS 3.0.3 is entered since there is no Condition and Action specified in the CTS. When one MSIS automatic logic channel is inoperable, ITS 3.3.4 ACTION C requires restoring a channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time (RICT) Program. When one automatic logic channel associated with one or more ESFAS Functions (except MSIS and AFAS) is inoperable, ITS 3.3.4 ACTION E also requires restoring a channel to OPERABLE status within 48 hours or in accordance with the RICT Program. This changes the CTS by providing time to restore one automatic logic channel of each ESFAS actuation Function within 48 hours or in accordance with the RICT Program. This change aligns the action for one inoperable SIAS, CSAS, CIS, MSIS, and RAS automatic actuation logic channel with the action for one inoperable AFAS automatic actuation logic channel, one inoperable ESFAS manual channel, and an inoperable channel for the Unit 2 ESFAS automatic logic actuation channels.

The purpose of the actions associated with the SIAS, CSAS, CIS, MSIS, and RAS automatic actuation instrumentation in CTS Table 3.3-3 is to ensure sufficient remedial measures are provided to allow safe operation pursuant the requirements of 10 CFR 50.36(c)(2). The SIAS, CSAS, CIS, MSIS, and RAS automatic actuation logic channels are implicitly assumed to be functional to support automatic actuation of the supported ESF equipment during design basis accidents and transients. This change is acceptable considering redundant automatic actuation logic channels are available to ensure the required equipment supported by the ESFAS (e.g., ECCS and Containment Spray System) will be capable of automatically actuating, diverse manual actuation channels are available, and a Completion Time beyond 48 hours will be evaluated, and the risk managed in accordance with the RICT Program. Extending the time to restore a single ESFAS automatic actuation logic channel to OPERABLE status has been previously evaluated and approved by the NRC for one inoperable AFAS automatic actuation logic channel, the ESFAS manual channels, and the Unit 2 ESFAS automatic actuation logic channels. In the NRC safety evaluation (SE) accompanying PSL Unit 1 License Amendment 247 (RICT Amendment), dated July 2, 2019, (NRC ADAMS Accession No. ML19113A099) the NRC concluded that the proposed RICT for the manual ESFAS channels and the Unit 2 automatic actuation logic channels does not impede accomplishing their safety function and does not alter the existing diversity of the affected functions. The NRC staff stated that the change is consistent with the defense-in-depth philosophy, and therefore acceptable. The acceptability was based, in part, on confirmation that more than one diverse means existed to accomplish the safety function for each identified accident condition, as indicated in the tables provided in FPL to NRC supplement letter, “Fourth Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, ‘Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b,’” dated March 15, 2018 (NRC ADAMS Accession No. ML18074A116). Tables 2 and 4 of the supplement letter provided the Instrumentation Diversity for each Unit 1 and Unit 2 ESFAS Instrument Function, respectively. As indicated in Table 2 of the RICT supplement letter, ESFAS diversity for the SIAS, CSAS, CIS, MSIS, and RAS automatic actuation instrumentation is provided by the respective manual actuation channels for each specified accident condition. Equivalent actions in Unit 2 CTS (Table 3.3-3, Action 12) allow restoration of one inoperable automatic actuation channel to OPERABLE status in 48 hours or in accordance with the RICT Program.

The NRC-approved RICT Program required by CTS 6.8.4.r (ITS 5.5.17) provides controls to calculate a RICT as implemented in accordance with NEI 06-09-A, Revision 0, “Risk-Managed Technical Specifications (RMTS) Guidelines.” In the NRC SE accompanying the RICT Amendment, the NRC found that the PSL PRA maintenance and change process ensures that the configuration risk management program models used in the RICT calculations will continue to use PRA methods acceptable to the NRC and that the PRA model will be updated as necessary to reflect the as-built and as-operated plant. The NRC also found that appropriate programmatic and procedural controls for the RICT Program are consistent with the guidance of NEI 06-09, Revision 0-A. Therefore, use of the RICT Program specified in the Technical Specifications to determine a RICT to restore an inoperable SIAS, CSAS, CIS, MSIS, or RAS automatic actuation logic channel is acceptable.

Based on the considerations described herein, the change to the Unit 1 CTS actions associated with one inoperable SIAS, CSAS, CIS, MSIS, or RAS automatic actuation logic channel continues to provide sufficient remedial measures to allow safe operation pursuant the requirements of 10 CFR 50.36(c)(2). This change is designated as less restrictive because the ITS Actions are less restrictive than the CTS Actions.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.3 INSTRUMENTATION (Analog)

3.3.2.1 3.3.~~5~~ 4 Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip~~ ~~(Analog)~~ Actuation

3.3.2.1 LCO 3.3.~~5~~ 4 Two ESFAS Manual ~~Trip~~ Actuation and two ESFAS Actuation Logic channels shall be OPERABLE for each ESFAS Function specified in Table 3.3.~~5~~ 4-1.

Table 3.3-3 Functional Unit 1.a, 2.a, 3.a, 4.a, 5.a., 7.a, 7.b

APPLICABILITY: According to Table 3.3.~~5~~ 4-1.

ACTIONS

-----NOTE-----

DOC A06 Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-9 Action 11 A. One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable.	A.1 Restore channel to OPERABLE status.	48 hours [OR In accordance with the Risk Informed Completion Time Program]
Table 3.3-9 Action 11 DOC A04 B. Two AFAS Manual ~~Trip~~ Actuation or Actuation Logic channels inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours [12] hours

INSERT 1

1

INSERT 1

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-9 Action 8 DOC L01 DOC L02 DOC L05	C. One Main Steam Isolation System (MSIS) Manual Actuation or Actuation Logic channel inoperable.	C.1 Restore channel to OPERABLE status.	48 hours OR In accordance with the Risk Informed Completion Time Program
Table 3.3-9 Action 8 DOC A03 DOC L01 DOC L02	D. Two MSIS Manual Actuation or Actuation Logic channels inoperable. OR Required Action and associated Completion Time of Condition C not met.	D.1.1 Close main steam isolation valves. AND D.1.2 Close main feedwater isolation valves. OR D.2.1 Be in MODE 3. AND D.2.2 Be in MODE 4.	6 hours 6 hours 6 hours 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME	
Table 3.3-9 Action 8 DOC L02 ~~C~~ E. One or more Functions with one Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable except AFAS and MSIS.	~~C~~ E.1	Restore channel to OPERABLE status.	48 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~	3 2 1 2
~~D. Required Action and associated Completion Time of Condition C not met.~~	~~D.1~~ ~~AND~~ ~~D.2~~	~~Be in MODE 3.~~ ~~-------------NOTE-------------~~ ~~LCO 3.0.4.a is not applicable when entering MODE 4.~~ ~~-----------------------------------~~ ~~Be in MODE 4.~~	~~6 hours~~ ~~12 hours~~	1
DOC A04 DOC L02 ~~E~~ F. One or more Functions with two Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable except AFAS and MSIS. OR Required Action and associated Completion Time of Condition E not met.	~~E~~ F.1 AND ~~E~~ F.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours	3 2 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
Table 4.3-2 Functional Unit 1.d, 2.c, 3.d, 4.c, 5.c, 7.c DOC L03	SR 3.3.~~5~~ 4 .1	----NOTES---- 1. Testing of Actuation Logic shall include verification of the proper operation of each initiation relay. 2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months. -------- Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
Table 4.3-2 Functional Unit 1.a, 2.a, 3.a, 4.a, 5.a, 7.a	SR 3.3.~~5~~ 4 .2	Perform a CHANNEL FUNCTIONAL TEST on each ESFAS Manual ~~Trip~~ Actuation channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2

3

4

Table 3.3.~~5~~-1 (page 1 of 1)
Engineered Safety Features Actuation System Actuation Logic and
Manual Channel Applicability

3

FUNCTION	APPLICABLE MODES	
1. Safety Injection Actuation Signal	1,2,3,~~[4]~~	
2. Containment Spray Actuation Signal	1,2,3,~~[4]~~	
3. Containment Isolation Actuation Signal	1,2,3,4	
4. Main Steam Isolation Signal	1,2,3,4(a)	DOC L01 — 1
5. Recirculation Actuation Signal	1,2,3,4	1
6. Auxiliary Feedwater Actuation Signal	1,2,3	1

DOC L01

(a) except when valves isolated by the MSIS Function are closed

4

3.3 INSTRUMENTATION (Analog)

3.3.2 3.3.~~5~~ 4 Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip~~ ~~(Analog)~~ Actuation 3

3.3.2 LCO 3.3.~~5~~ 4 Two ESFAS Manual ~~Trip~~ Actuation and two ESFAS Actuation Logic channels shall be OPERABLE for each ESFAS Function specified in Table 3.3.~~5~~ 4-1. 3 3

Table 3.3-3 Functional Unit 1.a, 1.d, 2.a, 2.c, 3.a, 3.e, 4.a, 4.d, 5.a., 5.c, 7.a, 7.b

APPLICABILITY: According to Table 3.3.~~5~~ 4-1.

ACTIONS

---NOTE---

DOC A06 Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-9 Action 15 A. One or more Functions with one Auxiliary Feedwater Actuation Signal (AFAS) Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable.	A.1 Restore channel to OPERABLE status.	48 hours ~~[~~OR 2 In accordance with the Risk Informed Completion Time Program~~]~~ 3 2
Table 3.3-9 Action 15 DOC A04 B. Two AFAS Manual ~~Trip~~ Actuation or Actuation Logic channels inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 3 ~~[~~12~~]~~ hours 2

INSERT 1 4

1

INSERT 1

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-9 Action 16 DOC L01 DOC L04	C. One Main Steam Isolation System (MSIS) Manual Actuation or Actuation Logic channel inoperable.	C.1 Restore channel to OPERABLE status.	48 hours OR In accordance with the Risk Informed Completion Time Program
Table 3.3-9 Action 12 DOC A03 DOC L01	D. Two MSIS Manual Actuation or Actuation Logic channels inoperable. OR Required Action and associated Completion Time of Condition C not met.	D.1.1 Close main steam isolation valves.	6 hours
		AND	
		D.1.2 Close main feedwater isolation valves.	6 hours
		OR	
		D.2.1 Be in MODE 3.	6 hours
		AND	
		D.2.2 Be in MODE 4.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C~~E. One or more Functions with one Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable except AFAS and MSIS.	~~C~~E.1 Restore channel to OPERABLE status.	48 hours ~~[~~OR In accordance with the Risk Informed Completion Time Program~~]~~
~~D. Required Action and associated Completion Time of Condition C not met.~~	~~D.1 Be in MODE 3.~~ ~~AND~~ ~~D.2 ---NOTE--- LCO 3.0.4.a is not applicable when entering MODE 4. ---~~ ~~Be in MODE 4.~~	~~6 hours~~ ~~12 hours~~
~~E~~F. One or more Functions with two Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable except AFAS and MSIS. OR Required Action and associated Completion Time of Condition E not met.	~~E~~F.1 Be in MODE 3. AND ~~E~~F.2 Be in MODE 5.	6 hours 36 hours

Table 3.3-9 Action 12

DOC A04

3 2 1 2 1 3 2 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
Table 4.3-2 Functional Unit 1.d, 2.c, 3.e, 4.d, 5.c, 7.c DOC L03 — SR 3.3.~~5~~.1 4	----------NOTES---------- 1. Testing of Actuation Logic shall include verification of the proper operation of each initiation relay. 3 2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested during the previous 6 months. -------------------- Perform a CHANNEL FUNCTIONAL TEST on each ESFAS logic channel.	~~[[92] days~~ 2 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 2
Table 4.3-2 Functional Unit 1.a, 2.a, 3.a, 4.a, 5.a, 7.a — SR 3.3.~~5~~.2 4	Perform a CHANNEL FUNCTIONAL TEST on each ESFAS Manual ~~Trip~~ Actuation channel.	~~[[18] months~~ 3 2 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 2

3 3

Table 3.3.~~5~~ 4-1 (page 1 of 1)
Engineered Safety Features Actuation System Actuation Logic and
Manual Channel Applicability

FUNCTION	APPLICABLE MODES
1. Safety Injection Actuation Signal	1,2,3,~~[4]~~
2. Containment Spray Actuation Signal	1,2,3,~~[4]~~
3. Containment Isolation Actuation Signal	1,2,3,4
4. Main Steam Isolation Signal	1,2,3,~~4~~ (a)
5. Recirculation Actuation Signal	1,2,3,4
6. Auxiliary Feedwater Actuation Signal	1,2,3

DOC L01 1 1 1

DOC L01 (a) except when valves isolated by the MSIS Function are closed 4

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) LOGIC AND MANUAL ACTUATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.5 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

4. ISTS Table 3.3.5-1, Function 4, Main Steam Isolation Signal, specifies an Applicability of MODES 1, 2, 3, and 4. ITS 3.3.4-1 (ISTS 3.3.5-1) requires the same function in MODES 1, 2, and 3 consistent with Unit 2 CTS for the same function. MODES 2 and 3 are also modified by Footnote (a) that states, “except when valves isolated by the MSIS Function are closed.” As a result of the change to the Applicability, ITS 3.3.4 includes proposed ACTIONS C and D. When one MSIS Manual Actuation or Actuation Logic channels is inoperable, proposed ACTION C requires restoring the channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program consistent with the Unit 1 CTS Actions. Discussion of Change L04 provides justification for the change to the Completion Time to restore the manual channel to OPERABLE status in the Unit 2 CTS Actions. When two MSIS Manual Actuation or Actuation Logic channels are inoperable or when the action to restore one MSIS Manual Actuation or Actuation Logic channel cannot be completed within the required Completion Time, proposed ACTION D requires closing the main steam isolation valves and the main feedwater isolation valves in 6 hours, or be in MODE 3 in 6 hours and MODE 4 in 12 hours.

   This ISTS deviation aligns the Applicability of the MSIS actuation instrumentation with the applicability requirements of the associated MSIS instrument channels (i.e., Footnote (f) to ISTS 3.3.4-1 (ITS 3.3.3-1), Function 4.a) and similar to the applicability of the supported equipment Specifications ITS 3.7.2, “Main Steam Isolation Valves (MSIVs)” and ITS 3.7.4, “Main Feedwater Isolation Valves (MFIVs).” Proposed ITS 3.3.4 ACTION C is added to differentiate the ACTIONS for the MSIS from the ACTIONS of the other ESFAS Logic and Manual Actuation signals. ITS 3.3.4 ACTION D is added to provide appropriate actions to reflect the change to the Applicability, which provides sufficient remedial actions to safely continue operation in lieu of a plant cooldown. Discussion of Change L01 provides justification for the change to the CTS Applicability for the MSIS and proposed actions to close the MSIVs and MFIVs.

   The purpose of the MSIS in ISTS Table 3.3.5-1 (ITS 3.3.4-1) is to ensure the ESFAS MSIS Functions are OPERABLE when the supported equipment is required to be

OPERABLE. The exception to MODE 2 and 3 is added to clarify that the MSIS manual and automatic actuation instrumentation is not required to be OPERABLE when the valves actuated by the MSIS instrumentation are in the closed position. Proposed ACTION D places the unit in a MODE or other specified condition in which the LCO does not apply by either closing the MSIVs and MFIVs within 6 hours (proposed Required Actions D.1.1 and D.1.2) or in MODE 3 within 6 hours and in MODE 4 within 12 hours (proposed Required Actions D.2.1 and D.2.2). The Completion Time of Required Actions D.1.1 and D.1.2 is consistent with the Completion Time to be in MODE 3. The 6-hour and 12-hour Completion Times of Required Actions D.2.1 and D.2.2, respectively, are based on the Completion Times to reach MODES 3 and 4 elsewhere in the ISTS and are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. Subsequent Conditions and Required Actions are renumerated, as applicable.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~ 3

B 3.3.~~5~~ 4 Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip (Analog)~~ Actuation 3

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based upon the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary and to mitigate accidents.

The ESFAS contains devices and circuitry that generate the following signals when the monitored variables reach levels that are indicative of conditions requiring protective action:

1. Safety Injection Actuation Signal (SIAS),
2. Containment Spray Actuation Signal (CSAS),
3. Containment Isolation ~~Actuation~~ Signal (CIAS), 1
4. Main Steam Isolation Signal (MSIS),
5. Recirculation Actuation Signal (RAS), and
6. Auxiliary Feedwater Actuation Signal (AFAS).

Equipment actuated by each of the above signals is identified in the U FSAR (Ref. 1). 1

Each of the above ESFAS actuation systems 3 is segmented into four sensor subsystems addressed by LCO 3.3.4, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," and two actuation subsystems addressed by this LCO. Each sensor subsystem includes measurement channels and bistables. The SIAS actuation subsystems include two logic subsystems for sequentially loading the diesel generators. 3

Each of the four sensor subsystem channels monitors redundant and independent process measurement channels. Each sensor is monitored by at least one bistable. The bistable associated with each ESFAS Function will trip when the monitored variable exceeds the trip setpoint. When tripped, the sensor subsystems provide outputs to the two actuation subsystems.

BASES

BACKGROUND (continued)

The two independent actuation subsystems each compare the four associated sensor subsystem outputs. If a trip occurs in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem will initiate one train of ESFAS. Each has sufficient equipment to provide protection to the public in the case of a Design Basis Event. The sensor subsystem is addressed in LCO 3.3.~~4~~ 3. This LCO addresses the actuation subsystem. 3

Each of the four sensor subsystems is mounted in a separate cabinet, excluding the sensors and field wiring.

The role of the sensor subsystem (measurement channels and bistables) is discussed in LCO 3.3.~~4~~ 3. That of the actuation subsystem is discussed below. 3

ESFAS Logic

The two independent actuation subsystems compare the four sensor subsystem outputs. If a trip occurs in the same parameter in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem initiates one train of ESFAS. Either train controls sufficient redundant and independent equipment.

INSERT 1

Each actuation subsystem channel is housed in two cabinets. One cabinet contains the logic circuitry for the actuation channel, while the other cabinet contains the power relay equipment. This power relay equipment includes the power relays (initiation relays) that actuate the ESFAS equipment in response to a signal from the Actuation Logic.

It is possible to change the two-out-of-four ESFAS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by disabling one channel input to the logic. Thus, the bistables will function normally, producing normal trip indication and annunciation, but ESFAS actuation will not occur since the bypassed channel is effectively removed from the coincidence logic. Maintenance bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. ~~At some plants an interlock prevents simultaneous maintenance bypassing of the same parameter in more than one channel.~~ Maintenance bypassing is normally employed during maintenance or testing. 1

1

INSERT 1

Each ESFAS consists of four measurement channels (designated MA, MB, MC, and MD) for each input parameter, two logic matrix systems (SA and SB) and two actuation channels (A and B).

Each measurement channel consists of a sensor, power supply and bistable unit arranged in a current flow loop circuit. The bistable unit provides a digital signal to logic matrices where signals from all four measurement channels for that parameter are combined in a two-out-of-four logic network. Isolation devices are provided to maintain separation between the measurement channels and the logic matrices. Logic matrices (SA or SB) provide initiation signals to their associated actuation channels (A or B) when the logic for the particular signal is satisfied.

BASES

BACKGROUND (continued)

~~For plants that have demonstrated sufficient channel to channel independence,~~ two-out-of-three logic is the minimum that is required to provide adequate plant protection, since a failure of one channel still ensures that ESFAS actuation would be generated by the two remaining OPERABLE channels. Two-out-of-three logic also prevents inadvertent actuation caused by any single channel failure in a trip condition. 1

In addition to the maintenance bypasses, there are operating bypasses (blocks) on the Pressurizer Pressure - Low input to the SIAS and on the Steam Generator Pressure - Low input to the MSIS when these inputs are no longer required for protection. These bypasses are enabled manually when the enabling conditions are satisfied in three of the four sensor subsystem channels. The operating bypass circuitry employs four bistable channels in the sensor subsystems, sensing pressurizer pressure (for the SIAS) and steam generator pressure (for the MSIS). These bistables provide contact output to the three-out-of-four logic in the two actuation subsystem channels. When the logic is satisfied, manual bypassing is permitted. There are two manual bypass actuation controls for each Function, one per train.

All operating bypasses are automatically removed when enabling bypass conditions are no longer satisfied.

Manual ESFAS initiation capability is provided to permit the operator to manually actuate an Engineered Safety Features (ESF) System when necessary. Two push buttons are provided in the control room for each ESFAS Function. Each push button actuates one train via the ESFAS Logic.

The Actuation Logic is tested by inserting a local test signal. A coincidence logic trip will occur if there is the simultaneous presence of a sensor channel trip, either legitimate or due to testing. Most ESFAS Functions employ several separate parallel two-out-of-four Actuation Logic modules, with each module actuating a subset of the ESFAS equipment associated with that Function. Each of these subchannels can be tested individually so that simultaneous actuation of an entire train can be avoided during testing.

INSERT 2

~~Except in the case of actuation subchannels SIAS Nos. 5 and 10, CIAS No. 5, and MSIS No. 1, all Actuation Logic channels can be tested at power. The above designated subchannels must be tested when shut down because they actuate the following equipment, which cannot be actuated at power:~~ 1

1

INSERT 2

Some logic channels are testable during reactor operation without affecting the operability or safety of the plant. These devices are tested by imposing an ESFAS during reactor operation. Other logic channels are not testable during reactor operation and must be tested when shutdown to prevent affecting the operability or safety of the plant. Testing Criteria are identified in the UFSAR (Ref. 1).

BASES

BACKGROUND (continued)

- ~~Reactor coolant pump (RCP) seal bleedoff isolation valves,~~
- ~~Service water isolation valves,~~
- ~~Volume control tank (VCT) discharge valves,~~
- ~~Letdown stop valves,~~
- ~~Component cooling water (CCW) to RCPs,~~
- ~~CCW from RCPs,~~
- ~~Main steam isolation valves (MSIVs),~~
- ~~Feedwater isolation valves, and~~
- ~~Instrument air containment isolation valves.~~

1

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. Functions such as Manual Initiation, not specifically credited in the accident analysis, serve as backups to Functions and are part of the NRC staff approved licensing basis for the plant.

ESFAS protective Functions are as follows:

1. Safety Injection Actuation Signal

   The SIAS ensures acceptable consequences during loss of coolant accident (LOCA) events, including steam generator tube rupture, and main steam line breaks (MSLBs) or feedwater line breaks (FWLBs) (inside containment). To provide the required protection, either a high containment pressure or a low pressurizer pressure signal will initiate SIAS. SIAS initiates the Emergency Core Cooling Systems (ECCS) and performs several other Functions, such as initiating control room isolation and starting the diesel generators.

BASES

APPLICABLE SAFETY ANALYSES (continued)

2. Containment Spray Actuation Signal

The CSAS initiates containment spray, preventing containment overpressurization during a LOCA or MSLB. ~~At some plants,~~ both a high containment pressure signal and an SIAS have to actuate to provide the required protection. This configuration reduces the likelihood of inadvertent containment spray. 1

3. Containment Isolation ~~Actuation~~ Signal 1

The CI~~A~~S actuates the Containment Isolation System, ensuring acceptable consequences during LOCAs and MSLBs or FWLBs (inside containment). To provide protection, a high containment pressure signal will initiate CI~~A~~S at the same setpoint at which an SIAS is initiated. 1 1

4. Main Steam Isolation Signal

The MSIS ensures acceptable consequences during an MSLB or FWLB by isolating both steam generators if either generator indicates a low steam generator pressure. The MSIS, concurrent with or following a reactor trip, minimizes the rate of heat extraction and subsequent cooldown of the RCS during these events.

5. Recirculation Actuation Signal

At the end of the injection phase of a LOCA, the refueling water tank (RWT) will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sump. Switchover from RWT to containment sump must occur before the RWT empties to prevent damage to the ECCS pumps and a loss of core cooling capability. For similar reasons, switchover must not occur before there is sufficient water in the containment sump to support pump suction. Furthermore, early switchover must not occur to ensure sufficient borated water is injected from the RWT to ensure the reactor remains shut down in the recirculation mode. An RWT Level - Low signal initiates the RAS.

BASES

APPLICABLE SAFETY ANALYSES (continued)

6. Auxiliary Feedwater Actuation Signal

An AFAS initiates feedwater flow to ~~both~~ the affected steam generator~~s~~ if a low level is indicated in ~~either~~ the affected steam generator, unless the generator is ~~ruptured~~ faulted.

The AFAS maintains a steam generator heat sink during the following events:

- MSLB,
- FWLB,
- Inadvertent opening of a steam generator atmospheric dump valve, and
- Loss of feedwater.

A low steam generator water level signal will initiate auxiliary feed to the affected steam generator.

INSERT 3 1

Secondary steam generator (SG) differential pressure (SG-A > SG-B) or (SG-B > SG-A) inhibits auxiliary feed to a generator identified as being ~~ruptured~~ faulted. This input to the AFAS logic prevents loss of the intact generator while preventing feeding a ~~ruptured~~ faulted generator during MSLBs and FWLBs. This prevents containment overpressurization during these events.

INSERT 4 1

The ESFAS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires that all components necessary to provide an ESFAS actuation be OPERABLE.

Actions allow maintenance bypass of individual channels. Plants are restricted to 48 hours in a maintenance bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic).

The Bases for the LCO on ESFAS automatic actuation Functions are addressed in the Bases for LCO 3.3.~~4~~ 3. Those associated with the Manual ~~Trip~~ Actuation or Actuation Logic are addressed below. 3

1

INSERT 3

A separate auxiliary feedwater actuation signal is generated for each Steam Generator (AFAS-1, AFAS-2). For each AFAS-1 and AFAS-2 there are four independent level transmitters for Steam Generator level, four independent Steam Generator pressure transmitters, and four independent Feedwater Header pressure transmitters. The AFAS actuation logic actuates auxiliary feedwater to a Steam Generator on low level after a time delay period unless that Steam Generator or its associated auxiliary feedwater supply header have been identified as being faulted.

1

INSERT 4

The AFAS actuation logic isolates auxiliary feedwater flow to a steam generator upon recovery of steam generator level.

BASES

LCO (continued)

1. Safety Injection Actuation Signal

   a. Manual ~~Trip~~ Actuation 1

      This LCO requires two channels of SIAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

   b. Actuation Logic

      This LCO requires two channels of SIAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

      ~~Failures in the actuation subsystems, including the manual bypass key switches, are Actuation Logic failures and are addressed in this LCO.~~ 1

      Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

2. Containment Spray Actuation Signal

   CSAS is initiated either manually or automatically. ~~At many plants~~ it is also necessary to have an automatic or manual SIAS for a complete actuation. ~~The SIAS opens the containment spray valves, whereas the CSAS actuates other required components.~~ The SIAS requirement should always be satisfied on a legitimate CSAS, since the Containment Pressure - High signal used in the SIAS ~~is the same~~ setpoint is less than the Containment Pressure – High High setpoint used in the CSAS. ~~The transmitters used to initiate CSAS are independent of those used in the SIAS to prevent inadvertent containment spray due to failures in two sensor channels.~~ 1 1 1 1

   a. Manual ~~Trip~~ Actuation

      This LCO requires two channels of CSAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4.

   b. Actuation Logic

      This LCO requires two channels of CSAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

      Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

BASES

LCO (continued)

3. Containment Isolation ~~Actuation~~ Signal 1

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of CI~~A~~S Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4.

b. Actuation Logic

This LCO requires two channels of Actuation Logic for CI~~A~~S to be OPERABLE in MODES 1, 2, 3, and 4. 1

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

4. Main Steam Isolation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels ~~per steam generator~~ of the MSIS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, and 3 except when all MSIVs are closed ~~, and 4~~. 1

Each channel actuates its associated MSIS Actuation Logic channel. Actuating either MSIS Manual Actuation will result in a full main steam isolation. 1

b. Actuation Logic

This LCO requires two channels of MSIS Actuation Logic to be OPERABLE in MODE~~S~~ 1 and MODES 2~~,~~ and 3 except when all MSIVs are closed ~~, and 4~~. 1

Each MSIS Actuation Logic channel provides a signal to its respective MSIV. An interposing relay will cause the opposite train MSIV to close.

~~Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in the logic LCO.~~

5. Recirculation Actuation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of RAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

b. Actuation Logic

This LCO requires two channels of RAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

LCO (continued)

6. <u>Auxiliary Feedwater Actuation Signal</u>

A low level in ~~either~~ the affected steam generator, as sensed by a two-out-of-four coincidence of four wide range sensors for each steam generator, will generate an auxiliary feedwater actuation signal (AFAS), which starts ~~both~~ the affected train~~s~~ of auxiliary feedwater (AFW) pumps and feeds ~~both~~ its steam generator~~s~~. The AFAS also monitors the secondary differential pressure in both steam generators and initiates an AFAS block signal to a ~~ruptured~~ faulted generator if the pressure in that generator is lower than the other generator by the differential pressure setpoint. 1 1 1

a. <u>Manual ~~Trip~~ Actuation</u> 1

This LCO requires two channels of AFAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, and 3. 1

b. <u>Actuation Logic</u>

This LCO requires two channels of AFAS Actuation Logic to be OPERABLE in MODES 1, 2, and 3.

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

APPLICABILITY

All ESFAS Functions are required to be OPERABLE in MODES 1, 2, and 3. In MODES 1, 2, and 3, there is sufficient energy in the primary and secondary systems to warrant automatic ESF System responses to:

- Close the MSIVs to preclude a positive reactivity addition,
- Actuate AFW to preclude the loss of the steam generators as a heat sink (in the event the normal feedwater system is not available),
- Actuate ESF systems to prevent or limit the release of fission product radioactivity to the environment by isolating containment and limiting the containment pressure from exceeding the containment design pressure during a design basis LOCA or MSLB, and
- Actuate ESF systems to ensure sufficient borated inventory to permit adequate core cooling and reactivity control during a design basis LOCA or MSLB accident.

BASES

APPLICABILITY (continued)

In MODES 4, 5, and 6, automatic actuation of ESFAS Functions is not required, because adequate time is available for plant operators to evaluate plant conditions and respond by manually operating the ESF components if required. ESFAS Manual ~~Trip~~ Actuation capability is required for Functions other than AFAS and MSIS in MODE 4 even though automatic actuation is not required. Because of the large number of components actuated on each ESFAS, actuation is simplified by the use of the Manual ~~Trip~~ Actuation push buttons. Manual ~~Trip~~ Actuation of AFAS is not required in MODE 4 because AFW or shutdown cooling will already be in operation in this MODE. 1 1

The ESFAS Actuation Logic must be OPERABLE in the same MODES as the Automatic and Manual ~~Trips~~ Actuations. In MODE 4, only the portion of the ESFAS logic responsible for the required Manual ~~Trip~~ Actuation must be OPERABLE. 1

In MODES 5 and 6, ESFAS initiated systems are either reconfigured or disabled for shutdown cooling operation. Accidents in these MODES are slow to develop and would be mitigated by manual operation of individual components.

ACTIONS

When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered, if applicable in the current MODE of operation.

A Note has been added to the ACTIONS to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function in Table 3.3.~~5~~ 4-1 in the LCO. Completion Times for the inoperable channel of a Function will be tracked separately. 3

<u>A.1</u>

Condition A applies to one AFAS Manual ~~Trip~~ Actuation or AFAS Actuation Logic channel inoperable. It is ~~identical~~ similar to Condition ~~C~~ E for the other ESFAS Functions, except for the shutdown track imposed by Condition ~~D~~ F. 1 1

The channel must be restored to OPERABLE status to restore redundancy of the AFAS Function. The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the only remaining OPERABLE channel. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ 2

3

BASES

ACTIONS (continued)

B.1 and B.2

If two Manual ~~Trip~~ Actuation or Actuation Logic channels are inoperable or the Required Action and associated Completion Time of Condition A cannot be met, the reactor should be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. 1 2

INSERT 5 1

~~C~~ E.1 3

Condition ~~C~~ E applies to one Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable for those ESFAS Functions that must be OPERABLE in MODES 1, 2, 3, and 4 (all Functions except AFAS and MSIS). The shutdown track imposed by Condition ~~D~~ F requires entry into MODE 5, where the LCO does not apply to the affected Functions. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ 1 2

The channel must be restored to OPERABLE status to restore redundancy of the affected Functions. The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the only remaining OPERABLE channel.

~~D.1 and D.2~~ 1

~~-------------------------------REVIEWER'S NOTE -------------------------------~~

~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~ 2

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~

~~--~~

3 1

1

INSERT 5

C.1

Condition C applies when one MSIS Manual Actuation or Actuation Logic channel is inoperable.

The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the remaining OPERABLE MSIS Manual Actuation or Actuation Logic channel. Alternatively, the Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

D.1.1, D.1.2, D.2.1, and D.2.2

If both MSIS Manual Actuation or Actuation Logic channels are inoperable or if the Required Actions and associated Conditions of Condition C are not met, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by closing the MSIVs and MFIVs within 6 hours (Required Actions D.1.1 and D.1.2). If allowed, operation in MODES 2 or 3 with MSIVs and MFIVs closed may continue because isolating the affected main steam line and main feedwater line accomplishes the safety function of the inoperable channel. Alternately, if the MSIVs and MFIVs cannot be closed, the plant must be placed in MODE 3 within 6 hours and in MODE 4 within 12 hours (Required Actions D.2.1 and D.2.2).

The Completion Times of Required Actions D.1.1 and D.1.2 is consistent with the Completion Time to be in MODE 3 for similar conditions and correspond to the Completion Time of D.2.1. The Completion Times of Required Actions D.2.1 and D.2.2 are based on the Completion Time to reach MODE 3 (i.e., 6 hours) and allow an additional 6 hours to reach MODE 4, respectively, if the MSIVs and MFIVs are not closed within 12 hours. These Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

3

BASES

ACTIONS (continued)

~~Condition D is entered when the Required Action and associated Completion Time of Condition C is not met. The plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.~~

1

~~Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 2). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.~~

~~Required Action D.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.~~

~~E~~ F.1 and ~~E~~ F.2

3

Condition ~~E~~ F is entered when one or more Functions have two Manual ~~Trip~~ Actuation or Actuation Logic channels inoperable except AFAS and MSIS. The plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

1

SURVEILLANCE REQUIREMENTS

SR 3.3.~~5~~4.1

A CHANNEL FUNCTIONAL TEST is performed to ensure the entire channel will perform its intended function when needed. Sensor subsystem tests are addressed in LCO 3.3.~~4~~3. This SR addresses Actuation Logic tests. A successful test of the required contact(s) of a

3 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Actuation Logic Tests

Actuation subsystem testing includes injecting one trip signal into each two-out-of-four logic subsystem in each ESFAS Function and using a bistable trip input to satisfy the trip logic. Initiation relays associated with the affected channel will then actuate the individual ESFAS components. Since each ESFAS Function employs subchannels of Actuation Logic, it is possible to actuate individual components without actuating an entire ESFAS Function.

Note 1 requires that Actuation Logic tests include operation of initiation relays. Note 2 allows deferred at power testing of certain relays to allow for the fact that operating certain relays during power operation could cause plant transients or equipment damage. ~~Those initiation relays that cannot be tested at power must be tested in accordance with Note 2. These include [SIAS No. 5, SIAS No. 10, CIAS No. 5, and MSIS No. 1.]~~ 1 2

~~These relays actuate the following components, which cannot be tested at power:~~

- ~~RCP seal bleedoff isolation valves,~~ 1
- ~~Service water isolation valves,~~
- ~~VCT discharge valves,~~
- ~~Letdown stop valves,~~
- ~~CCW to and from the RCPs,~~
- ~~MSIVs and feedwater isolation valves, and~~
- ~~Instrument air containment isolation valves.~~

~~The reasons that each of the above cannot be fully tested at power are stated in Reference 1.~~

These tests verify that the ESFAS is capable of performing its intended function, from bistable input through the actuated components.

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 3).~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~-----]~~

SR 3.3.~~5~~ 4 .2

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing Manual ~~Trip~~ Actuation of the Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual ~~Trip~~ Actuation of the Function. ~~[The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ 2

REFERENCES

1. U FSAR, Section ~~[~~7.3~~]~~. 1 2

~~2. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.~~ 1

~~3. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~ 1

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~5~~ 4 Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip (Analog)~~ Actuation

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based upon the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary and to mitigate accidents.

The ESFAS contains devices and circuitry that generate the following signals when the monitored variables reach levels that are indicative of conditions requiring protective action:

1. Safety Injection Actuation Signal (SIAS),
2. Containment Spray Actuation Signal (CSAS),
3. Containment Isolation Actuation Signal (CIAS),
4. Main Steam Isolation Signal (MSIS),
5. Recirculation Actuation Signal (RAS), and
6. Auxiliary Feedwater Actuation Signal (AFAS).

Equipment actuated by each of the above signals is identified in the U FSAR (Ref. 1).

Each of the above ESFAS actuation systems is segmented into four sensor subsystems addressed by LCO 3.3.4 3, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," and two actuation subsystems addressed by this LCO. Each sensor subsystem includes measurement channels and bistables. The SIAS actuation subsystems include two logic subsystems for sequentially loading the diesel generators.

Each of the four sensor subsystem channels monitors redundant and independent process measurement channels. Each sensor is monitored by at least one bistable. The bistable associated with each ESFAS Function will trip when the monitored variable exceeds the trip setpoint. When tripped, the sensor subsystems provide outputs to the two actuation subsystems.

BASES

BACKGROUND (continued)

The two independent actuation subsystems each compare the four associated sensor subsystem outputs. If a trip occurs in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem will initiate one train of ESFAS. Each has sufficient equipment to provide protection to the public in the case of a Design Basis Event. The sensor subsystem is addressed in LCO 3.3.~~4~~ 3. This LCO addresses the actuation subsystem. 3

Each of the four sensor subsystems is mounted in a separate cabinet, excluding the sensors and field wiring.

The role of the sensor subsystem (measurement channels and bistables) is discussed in LCO 3.3.~~4~~ 3. That of the actuation subsystem is discussed below. 3

ESFAS Logic

The two independent actuation subsystems compare the four sensor subsystem outputs. If a trip occurs in the same parameter in two or more sensor subsystem channels, the two-out-of-four logic in each actuation subsystem initiates one train of ESFAS. Either train controls sufficient redundant and independent equipment.

INSERT 1

Each actuation subsystem channel is housed in two cabinets. One cabinet contains the logic circuitry for the actuation channel, while the other cabinet contains the power relay equipment. This power relay equipment includes the power relays (initiation relays) that actuate the ESFAS equipment in response to a signal from the Actuation Logic.

It is possible to change the two-out-of-four ESFAS Logic to a two-out-of-three logic for a given input parameter in one channel at a time by disabling one channel input to the logic. Thus, the bistables will function normally, producing normal trip indication and annunciation, but ESFAS actuation will not occur since the bypassed channel is effectively removed from the coincidence logic. Maintenance bypassing can be simultaneously performed on any number of parameters in any number of channels, providing each parameter is bypassed in only one channel at a time. ~~At some plants an interlock prevents simultaneous maintenance bypassing of the same parameter in more than one channel.~~ Maintenance bypassing is normally employed during maintenance or testing. 1

1

INSERT 1

Each ESFAS consists of four measurement channels (designated MA, MB, MC, and MD) for each input parameter, two logic matrix systems (SA and SB) and two actuation channels (A and B).

Each measurement channel consists of a sensor, power supply and bistable unit arranged in a current flow loop circuit. The bistable unit provides a digital signal to logic matrices where signals from all four measurement channels for that parameter are combined in a two-out-of-four logic network. Isolation devices are provided to maintain separation between the measurement channels and the logic matrices. Logic matrices (SA or SB) provide initiation signals to their associated actuation channels (A or B) when the logic for the particular signal is satisfied.

BASES

BACKGROUND (continued)

~~For plants that have demonstrated sufficient channel to channel independence,~~ two-out-of-three logic is the minimum that is required to provide adequate plant protection, since a failure of one channel still ensures that ESFAS actuation would be generated by the two remaining OPERABLE channels. Two-out-of-three logic also prevents inadvertent actuation caused by any single channel failure in a trip condition. 1

In addition to the maintenance bypasses, there are operating bypasses (blocks) on the Pressurizer Pressure - Low input to the SIAS and on the Steam Generator Pressure - Low input to the MSIS when these inputs are no longer required for protection. These bypasses are enabled manually when the enabling conditions are satisfied in three of the four sensor subsystem channels. The operating bypass circuitry employs four bistable channels in the sensor subsystems, sensing pressurizer pressure (for the SIAS) and steam generator pressure (for the MSIS). These bistables provide contact output to the three-out-of-four logic in the two actuation subsystem channels. When the logic is satisfied, manual bypassing is permitted. There are two manual bypass actuation controls for each Function, one per train.

All operating bypasses are automatically removed when enabling bypass conditions are no longer satisfied.

Manual ESFAS initiation capability is provided to permit the operator to manually actuate an Engineered Safety Features (ESF) System when necessary. Two push buttons are provided in the control room for each ESFAS Function. Each push button actuates one train via the ESFAS Logic.

The Actuation Logic is tested by inserting a local test signal. A coincidence logic trip will occur if there is the simultaneous presence of a sensor channel trip, either legitimate or due to testing. Most ESFAS Functions employ several separate parallel two-out-of-four Actuation Logic modules, with each module actuating a subset of the ESFAS equipment associated with that Function. Each of these subchannels can be tested individually so that simultaneous actuation of an entire train can be avoided during testing.

INSERT 2

~~Except in the case of actuation subchannels SIAS Nos. 5 and 10, CIAS No. 5, and MSIS No. 1, all Actuation Logic channels can be tested at power. The above designated subchannels must be tested when shut down because they actuate the following equipment, which cannot be actuated at power:~~ 1

1

INSERT 2

Some logic channels are testable during reactor operation without affecting the operability or safety of the plant. These devices are tested by imposing an ESFAS during reactor operation. Other logic channels are not testable during reactor operation and must be tested when shutdown to prevent affecting the operability or safety of the plant. Testing Criteria are identified in the UFSAR (Ref. 1).

BASES

BACKGROUND (continued)

- ~~Reactor coolant pump (RCP) seal bleedoff isolation valves,~~
- ~~Service water isolation valves,~~
- ~~Volume control tank (VCT) discharge valves,~~
- ~~Letdown stop valves,~~
- ~~Component cooling water (CCW) to RCPs,~~
- ~~CCW from RCPs,~~
- ~~Main steam isolation valves (MSIVs),~~
- ~~Feedwater isolation valves, and~~
- ~~Instrument air containment isolation valves.~~

APPLICABLE SAFETY ANALYSES

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. Functions such as Manual Initiation, not specifically credited in the accident analysis, serve as backups to Functions and are part of the NRC staff approved licensing basis for the plant.

ESFAS protective Functions are as follows:

1. Safety Injection Actuation Signal

   The SIAS ensures acceptable consequences during loss of coolant accident (LOCA) events, including steam generator tube rupture, and main steam line breaks (MSLBs) or feedwater line breaks (FWLBs) (inside containment). To provide the required protection, either a high containment pressure or a low pressurizer pressure signal will initiate SIAS. SIAS initiates the Emergency Core Cooling Systems (ECCS) and performs several other Functions, such as initiating control room isolation and starting the diesel generators.

BASES

APPLICABLE SAFETY ANALYSES (continued)

2. Containment Spray Actuation Signal

The CSAS initiates containment spray, preventing containment overpressurization during a LOCA or MSLB. ~~At some plants,~~ both a high containment pressure signal and an SIAS have to actuate to provide the required protection. This configuration reduces the likelihood of inadvertent containment spray. 1

3. Containment Isolation Actuation Signal

The CIAS actuates the Containment Isolation System, ensuring acceptable consequences during LOCAs and MSLBs or FWLBs (inside containment). To provide protection, a high containment pressure signal will initiate CIAS at the same setpoint at which an SIAS is initiated.

4. Main Steam Isolation Signal

The MSIS ensures acceptable consequences during an MSLB or FWLB by isolating both steam generators if either generator indicates a low steam generator pressure. The MSIS, concurrent with or following a reactor trip, minimizes the rate of heat extraction and subsequent cooldown of the RCS during these events.

5. Recirculation Actuation Signal

At the end of the injection phase of a LOCA, the refueling water tank (RWT) will be nearly empty. Continued cooling must be provided by the ECCS to remove decay heat. The source of water for the ECCS pumps is automatically switched to the containment recirculation sump. Switchover from RWT to containment sump must occur before the RWT empties to prevent damage to the ECCS pumps and a loss of core cooling capability. For similar reasons, switchover must not occur before there is sufficient water in the containment sump to support pump suction. Furthermore, early switchover must not occur to ensure sufficient borated water is injected from the RWT to ensure the reactor remains shut down in the recirculation mode. An RWT Level - Low signal initiates the RAS.

BASES

APPLICABLE SAFETY ANALYSES (continued)

6. Auxiliary Feedwater Actuation Signal

An AFAS initiates feedwater flow to ~~both~~ the affected steam generator~~s~~ if a low level is indicated in ~~either~~ the affected steam generator, unless the generator is ~~ruptured~~ faulted.

The AFAS maintains a steam generator heat sink during the following events:

- MSLB,
- FWLB,
- Inadvertent opening of a steam generator atmospheric dump valve, and
- Loss of feedwater.

A low steam generator water level signal will initiate auxiliary feed to the affected steam generator.

INSERT 3 1

Secondary steam generator (SG) differential pressure (SG-A > SG-B) or (SG-B > SG-A) inhibits auxiliary feed to a generator identified as being ~~ruptured~~ faulted. This input to the AFAS logic prevents loss of the intact generator while preventing feeding a ~~ruptured~~ faulted generator during MSLBs and FWLBs. This prevents containment overpressurization during these events.

INSERT 4 1

The ESFAS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires that all components necessary to provide an ESFAS actuation be OPERABLE.

Actions allow maintenance bypass of individual channels. Plants are restricted to 48 hours in a maintenance bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic).

The Bases for the LCO on ESFAS automatic actuation Functions are addressed in the Bases for LCO 3.3.~~4~~ 3. Those associated with the Manual ~~Trip~~ Actuation or Actuation Logic are addressed below. 3

1

INSERT 3

A separate auxiliary feedwater actuation signal is generated for each Steam Generator (AFAS-1, AFAS-2). For each AFAS-1 and AFAS-2 there are four independent level transmitters for Steam Generator level, four independent Steam Generator pressure transmitters, and four independent Feedwater Header pressure transmitters. The AFAS actuation logic actuates auxiliary feedwater to a Steam Generator on low level after a time delay period unless that Steam Generator or its associated auxiliary feedwater supply header have been identified as being faulted.

1

INSERT 4

The AFAS actuation logic isolates auxiliary feedwater flow to a steam generator upon recovery of steam generator level.

BASES

LCO (continued)

1. Safety Injection Actuation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of SIAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

b. Actuation Logic

This LCO requires two channels of SIAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

~~Failures in the actuation subsystems, including the manual bypass key switches, are Actuation Logic failures and are addressed in this LCO.~~ 1

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

2. Containment Spray Actuation Signal

CSAS is initiated either manually or automatically. ~~At many plants~~ it is also necessary to have an automatic or manual SIAS for a complete actuation. ~~The SIAS opens the containment spray valves, whereas the CSAS actuates other required components~~. The SIAS requirement should always be satisfied on a legitimate CSAS, since the Containment Pressure - High signal used in the SIAS ~~is the same~~ setpoint is less than the Containment Pressure – High High setpoint used in the CSAS. ~~The transmitters used to initiate CSAS are independent of those used in the SIAS to prevent inadvertent containment spray due to failures in two sensor channels.~~ 1 1 1 1

a. Manual ~~Trip~~ Actuation

This LCO requires two channels of CSAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

b. Actuation Logic

This LCO requires two channels of CSAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

BASES

LCO (continued)

3. Containment Isolation Actuation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of CIAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

b. Actuation Logic

This LCO requires two channels of Actuation Logic for CIAS to be OPERABLE in MODES 1, 2, 3, and 4.

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

4. Main Steam Isolation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels ~~per steam generator~~ of the MSIS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, and 3~~, and 4~~ except when all MSIVs are closed. 1 1

Each channel actuates its associated MSIS Actuation Logic channel. Actuating either MSIS Manual Actuation will result in a full main steam isolation.

b. Actuation Logic

This LCO requires two channels of MSIS Actuation Logic to be OPERABLE in MODE~~S~~ and MODES 1, 2~~,~~ and 3~~, and 4~~ except when all MSIVs are closed. 1

Each MSIS Actuation Logic channel provides a signal to its respective MSIV. An interposing relay will cause the opposite train MSIV to close.

~~Failures in the actuation subsystems, including the manual bypass key switches, are considered Actuation Logic failures and are addressed in the logic LCO.~~

5. Recirculation Actuation Signal

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of RAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, 3, and 4. 1

b. Actuation Logic

This LCO requires two channels of RAS Actuation Logic to be OPERABLE in MODES 1, 2, 3, and 4.

BASES

LCO (continued)

6. Auxiliary Feedwater Actuation Signal

A low level in ~~either~~ the affected steam generator, as sensed by a steam two-out-of-four coincidence of four wide range sensors for each generator, will 1
generate an auxiliary feedwater actuation signal (AFAS), which starts its ~~both~~ the affected trains of auxiliary feedwater (AFW) pumps and feeds ~~both~~ steam 1
generator~~s~~. The AFAS also monitors the secondary differential pressure in both steam generators and initiates an AFAS block signal 1
to a ~~ruptured~~ faulted generator if the pressure in that generator is lower than the other generator by the differential pressure setpoint. 1

a. Manual ~~Trip~~ Actuation 1

This LCO requires two channels of AFAS Manual ~~Trip~~ Actuation to be OPERABLE in MODES 1, 2, and 3.

b. Actuation Logic

This LCO requires two channels of AFAS Actuation Logic to be OPERABLE in MODES 1, 2, and 3.

Actuation Logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

APPLICABILITY

All ESFAS Functions are required to be OPERABLE in MODES 1, 2, and 3. In MODES 1, 2, and 3, there is sufficient energy in the primary and secondary systems to warrant automatic ESF System responses to:

- Close the MSIVs to preclude a positive reactivity addition,
- Actuate AFW to preclude the loss of the steam generators as a heat sink (in the event the normal feedwater system is not available),
- Actuate ESF systems to prevent or limit the release of fission product radioactivity to the environment by isolating containment and limiting the containment pressure from exceeding the containment design pressure during a design basis LOCA or MSLB, and
- Actuate ESF systems to ensure sufficient borated inventory to permit adequate core cooling and reactivity control during a design basis LOCA or MSLB accident.

BASES

APPLICABILITY (continued)

In MODES 4, 5, and 6, automatic actuation of ESFAS Functions is not required, because adequate time is available for plant operators to evaluate plant conditions and respond by manually operating the ESF components if required. ESFAS Manual ~~Trip~~ Actuation capability is required for Functions other than AFAS and MSIS in MODE 4 even though automatic actuation is not required. Because of the large number of components actuated on each ESFAS, actuation is simplified by the use of the Manual ~~Trip~~ Actuation push buttons. Manual ~~Trip~~ Actuation of AFAS is not required in MODE 4 because AFW or shutdown cooling will already be in operation in this MODE. 1 1

The ESFAS Actuation Logic must be OPERABLE in the same MODES as the Automatic and Manual ~~Trips~~ Actuations. In MODE 4, only the portion of the ESFAS logic responsible for the required Manual ~~Trip~~ Actuation must be OPERABLE. 1

In MODES 5 and 6, ESFAS initiated systems are either reconfigured or disabled for shutdown cooling operation. Accidents in these MODES are slow to develop and would be mitigated by manual operation of individual components.

ACTIONS

When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered, if applicable in the current MODE of operation.

A Note has been added to the ACTIONS to clarify the application of the Completion Time rules. The Conditions of this Specification may be entered independently for each Function in Table 3.3.~~5~~4-1 in the LCO. Completion Times for the inoperable channel of a Function will be tracked separately. 3

A.1

Condition A applies to one AFAS Manual ~~Trip~~ Actuation or AFAS Actuation Logic channel inoperable. It is ~~identical~~ similar to Condition ~~C~~ E for the other ESFAS Functions, except for the shutdown track imposed by Condition ~~D~~ F. 1 1

The channel must be restored to OPERABLE status to restore redundancy of the AFAS Function. The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the only remaining OPERABLE channel. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~ 2

BASES

ACTIONS (continued)

B.1 and B.2

If two Manual ~~Trip~~ Actuation or Actuation Logic channels are inoperable or the Required Action and associated Completion Time of Condition A cannot be met, the reactor should be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

INSERT 5

~~C~~ E.1

Condition ~~C~~ E applies to one Manual ~~Trip~~ Actuation or Actuation Logic channel inoperable for those ESFAS Functions that must be OPERABLE in MODES 1, 2, 3, and 4 (all Functions except AFAS and MSIS). The shutdown track imposed by Condition ~~D~~ F requires entry into MODE 5, where the LCO does not apply to the affected Functions. ~~[~~Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.~~]~~

The channel must be restored to OPERABLE status to restore redundancy of the affected Functions. The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the only remaining OPERABLE channel.

~~D.1 and D.2~~

~~-----REVIEWER'S NOTE-----~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

~~1. [LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

~~2. [LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~
~~----------~~

1

INSERT 5

C.1

Condition C applies when one MSIS Manual Actuation or Actuation Logic channel is inoperable.

The 48 hour Completion Time is commensurate with the importance of avoiding the vulnerability of a single failure in the remaining OPERABLE MSIS Manual Actuation or Actuation Logic channel. Alternatively, the Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

D.1.1, D.1.2, D.2.1, and D.2.2

If both MSIS Manual Actuation or Actuation Logic channels are inoperable or if the Required Actions and associated Conditions of Condition C are not met, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by closing the MSIVs and MFIVs within 6 hours (Required Actions D.1.1 and D.1.2). If allowed, operation in MODES 2 or 3 with MSIVs and MFIVs closed may continue because isolating the affected main steam line and main feedwater line accomplishes the safety function of the inoperable channel. Alternately, if the MSIVs and MFIVs cannot be closed, the plant must be placed in MODE 3 within 6 hours and in MODE 4 within 12 hours (Required Actions D.2.1 and D.2.2).

The Completion Times of Required Actions D.1.1 and D.1.2 is consistent with the Completion Time to be in MODE 3 for similar conditions and correspond to the Completion Time of D.2.1. The Completion Times of Required Actions D.2.1 and D.2.2 are based on the Completion Time to reach MODE 3 (i.e., 6 hours) and allow an additional 6 hours to reach MODE 4, respectively, if the MSIVs and MFIVs are not closed within 12 hours. These Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

ACTIONS (continued)

~~Condition D is entered when the Required Action and associated Completion Time of Condition C is not met. The plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.~~ 1

~~Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 2). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.~~

~~Required Action D.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.~~

F ~~E~~.1 and ~~E~~.2 F

Condition ~~E~~ F is entered when one or more Functions have two Manual ~~Trip~~ Actuation or Actuation Logic channels inoperable except AFAS and MSIS. The plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. 3 1

SURVEILLANCE REQUIREMENTS

SR 3.3.~~5~~4.1

A CHANNEL FUNCTIONAL TEST is performed to ensure the entire channel will perform its intended function when needed. Sensor subsystem tests are addressed in LCO 3.3.~~4~~3. This SR addresses Actuation Logic tests. A successful test of the required contact(s) of a

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

Actuation Logic Tests

Actuation subsystem testing includes injecting one trip signal into each two-out-of-four logic subsystem in each ESFAS Function and using a bistable trip input to satisfy the trip logic. Initiation relays associated with the affected channel will then actuate the individual ESFAS components. Since each ESFAS Function employs subchannels of Actuation Logic, it is possible to actuate individual components without actuating an entire ESFAS Function.

Note 1 requires that Actuation Logic tests include operation of initiation relays. Note 2 allows deferred at power testing of certain relays to allow for the fact that operating certain relays during power operation could cause plant transients or equipment damage. ~~Those initiation relays that cannot be tested at power must be tested in accordance with Note 2. These include [SIAS No. 5, SIAS No. 10, CIAS No. 5, and MSIS No. 1.]~~ 1 2

~~These relays actuate the following components, which cannot be tested at power:~~

- ~~RCP seal bleedoff isolation valves,~~ 1
- ~~Service water isolation valves,~~
- ~~VCT discharge valves,~~
- ~~Letdown stop valves,~~
- ~~CCW to and from the RCPs,~~
- ~~MSIVs and feedwater isolation valves, and~~
- ~~Instrument air containment isolation valves.~~

~~The reasons that each of the above cannot be fully tested at power are stated in Reference 1.~~

These tests verify that the ESFAS is capable of performing its intended function, from bistable input through the actuated components.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency of [92] days is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 3).~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

SR 3.3.~~5~~4.2

A CHANNEL FUNCTIONAL TEST is performed on the manual ESFAS actuation circuitry, de-energizing relays and providing Manual ~~Trip~~ Actuation of the Function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual ~~Trip~~ Actuation of the Function. ~~[The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

REFERENCES

1. U FSAR, Section ~~[~~7.3~~]~~.

~~2. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.~~

~~3. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4 BASES, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) LOGIC AND MANUAL ACTUATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.5 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.4, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS)
LOGIC AND MANUAL ACTUATION

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L01

Florida Power & Light Company (FPL) is converting the St. Lucie Plant (PSL) Unit 1 and Unit 2 Technical Specifications to the Improved Technical Specifications (ITS) as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants," Revision 5. The proposed change involves making the current technical specifications (CTS) less restrictive. Below is the description of the change and the determination of No Significant Hazards Considerations for conversion to NUREG-1432.

Unit 1 CTS 3.3.2.1, Table 3.3-3 Functional Unit 4 – main steam isolation signal (MSIS) manual actuation is applicable in MODES 1, 2, 3, and 4 and Table 4.3-2 Functional Unit 4 – MSIS automatic actuation logic is applicable in MODES 1, 2, and 3. Unit 2 CTS 3.3.2, Tables 3.3-3 and 4.3-2 Functional Unit 4 – MSIS manual and automatic actuation logic are applicable in MODES 1, 2, and 3. When one Unit 1 MSIS manual actuation channel is inoperable or one Unit 2 MSIS automatic actuation logic channel is inoperable, CTS Table 3.3-3 Action 8 (Unit 1) and Action 12 (Unit 2) require, in part, to restore the channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program.

ITS Limiting Condition for Operation (LCO) 3.3.4 (Table 3.3.4-1) requires the MSIS manual actuation and automatic actuation channel to be OPERABLE in MODES 1, 2, 3 except in MODES 2 and 3 when valves isolated by the MSIS Function are closed as specified in Footnote (a). ITS actions require closing the main steam isolation valves (MSIVs) and the main feedwater isolation valves (MFIVs) in 6 hours, or be in MODE 3 in 6 hours and MODE 4 in 12 hours when two MSIS Manual Actuation or Actuation Logic channels are inoperable or when the action to restore one MSIS Manual Actuation or Actuation Logic channel cannot be completed within the required Completion Time. This changes the CTS by deleting the MODE 4 applicability requirement for Unit 1 MSIS, and changing the MODE 2 and 3 Applicability for both units to include "except when valves isolated by the MSIS Function are closed." This change aligns the Applicability of the MSIS actuation instrumentation with the applicability requirements of the associated MSIS instrument channels (i.e., steam generator low pressure instrument channels and the Unit 2 containment high pressure instrument channels) and the supported equipment (i.e., the MSIVs and MFIVs). The change also revises the CTS Actions to add appropriate actions to reflect the change to the Applicability, which provides sufficient remedial actions to safely continue operation in lieu of a plant cooldown.

The purpose of the MSIS manual and automatic instrumentation in CTS Table 3.3-3 is to ensure the Engineered Safety Features Actuation System (ESFAS) MSIS Functions are OPERABLE when the supported equipment is required to be OPERABLE. Automatic steam line and feedwater line isolation is assumed in the mitigation of a major secondary system pipe rupture accident (e.g., main steam line break or feedwater line break). The MSIS manual actuation instrumentation is not credited in the safety analysis and a safety analysis limit is not specified for this actuation function. MSIS automatic actuation instrumentation is credited in the safety analysis.

In MODES 1, 2, and 3, there is sufficient energy in the primary and secondary systems to warrant automatic ESF System response to ensure the main steam and feedwater lines can be isolated in the event of a high energy secondary system pipe rupture. The exception to MODE 2 and 3 are added to clarify that the MSIS manual and automatic actuation instrumentation is not required to be OPERABLE when the valves actuated by the MSIS instrumentation are in positions that support the safety analyses. When the valves isolated by the MSIS function are in the closed position, they are in their assumed accident position. This change is acceptable, because when the MSIVs and MFIVs are closed, the adverse effects of a high energy secondary system pipe rupture are precluded and the requirements continue to ensure that the structures, systems, and components (SSCs) are maintained in the MODES and other specified conditions assumed in the safety analyses. The proposed applicability and actions provide the same level of protection as the current requirements for the supported equipment.

Since the proposed actions provide the allowance to place the MSIVs and MFIVs in their accident position with the option to continue a plant cooldown, sufficient remedial measures continue to be provided to allow safe operation pursuant to the requirements of 10 CFR 50.36(c)(2).

FPL has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

   The proposed change does not affect accident initiators or precursors nor adversely alter the design assumptions, conditions, and configuration of the facility. The proposed change does not alter any plant equipment or operating practices with respect to such initiators or precursors in a manner that the probability of an accident is increased. The proposed change revises the applicability requirements for the ESFAS MSIS actuation instrumentation to align with the applicability requirements of the associated instrument channels and the supported equipment. Changing the applicability requirements of the MSIS actuation instrumentation to be consistent with the applicability requirements of the associated instrument channels and the supported equipment does not alter the probability or consequences of previously evaluated accidents. In addition, the proposed actions provide sufficient remedial measures to continue safe operation in lieu of a plant cooldown. The proposed change does not involve a physical change to the ESFAS, nor does it change the safety function of the ESFAS instrumentation or the equipment supported by the ESFAS instrumentation. Automatic steam line and feedwater line isolation is assumed in the mitigation of a major secondary system pipe rupture accident. When the valves are in the closed position, they are in their assumed accident position. Therefore, the adverse effects of a high energy secondary system pipe rupture are precluded. As a result, the proposed change does not alter assumptions relative to the mitigation of a previously evaluated accident.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   With respect to a new or different kind of accident, there are no proposed design changes to the ESFAS; nor are there any changes in the method by which safety related plant SSCs perform their specified safety functions. The proposed change will not affect the normal method of plant operation or revise any operating parameters. No new accident scenarios, transient precursor, failure mechanisms, or limiting single failures will be introduced as a result of this proposed change and the failure modes and effects analyses of SSCs important to safety are not altered as a result of this change.

   The proposed change does not alter the design or performance of the ESFAS, rather, the change aligns the applicability requirements of the MSIS actuation instrumentation with the applicability requirements of the associated instrument channels and the supported equipment. The proposed actions provide sufficient remedial measures to continue safe operation in lieu of a plant cooldown. The process to close the MSIVs and the MFIVs or place the unit in a shutdown condition uses current procedures, methods, and processes already established and currently in use and, therefore, does not constitute a new type of test.

   No changes are being proposed to the procedures that operate the plant equipment and the change does not have a detrimental impact on the manner in which plant equipment operates or responds to an actuation signal.

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

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

   Response: No.

   The margin of safety is related to the ability of the fission product barriers to perform their design functions during and following an accident. These barriers include the fuel cladding, the reactor coolant system, and the containment. The performance of these fission product barriers is not affected by the proposed change.

   Instrumentation safety margin is established by ensuring the limiting safety system settings (LSSSs) automatically actuate the applicable design function to correct an abnormal situation before a safety limit is exceeded. Safety analysis limits are established for reactor trip system and ESFAS instrumentation functions related to those variables having significant safety functions. The proposed change aligns the applicability requirements of the MSIS actuation instrumentation with the applicability requirements of the associated instrument channels and the supported equipment. The proposed actions provide sufficient remedial measures to continue safe operation in lieu of a plant cooldown. The MSIS manual actuation instrumentation is not credited in the safety analysis and a safety analysis limit is not specified for this actuation function. Therefore, the MSIS manual actuation instrumentation does not represent an LSSS because this instrumentation does not monitor a plant variable on which a safety limit has been placed. In addition, the change to the applicability and actions of the MSIS automatic actuation logic does not alter the capability of the LSSSs to automatically actuate the applicable design function to correct an abnormal situation before a safety limit is exceeded because the applicability and optional remedial actions to close the associated valves ensure the components are in their safety position precluding adverse effects of a high energy secondary system pipe rupture. The proposed change does not alter the instrumentation used to monitor a plant variable on which a safety limit has been placed.

The controlling parameters established to isolate the steam and feedwater lines during an accident or transient are not affected by the proposed change and no design basis or safety limit is altered as a result of the proposed change. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above analysis, FPL concludes that the proposed change does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of no significant hazards consideration is justified.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L04 – UNIT 2
LESS RESTRICTIVE CHANGE L05 – UNIT 1

Florida Power & Light Company (FPL) is converting the St. Lucie Plant (PSL) Unit 1 and Unit 2 Technical Specifications to the Improved Technical Specifications (ITS) as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants," Revision 5. The proposed change involves making the current technical specifications (CTS) less restrictive. Below is the description of the change and the determination of No Significant Hazards Considerations for conversion to NUREG-1432.

When one Unit 2 main steam isolation signal (MSIS) manual trip button channel is inoperable, CTS actions require the channel to be restored to OPERABLE status within 48 hours or declare the associated valve inoperable and take the actions required by the supported system specification. ITS requires restoring the channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time (RICT) Program. This changes the CTS by optionally allowing the manual channel to be restored in accordance with the RICT Program provided the associated risk is assessed and managed and in accordance with an NRC approved RICT Program. This change aligns the action for one inoperable Unit 2 MSIS manual channel with the action for one inoperable Unit 1 MSIS manual channel and the action for one inoperable channel of the other Engineered Safety Features Actuation System (ESFAS) manual actuation channels.

Unit 1 CTS does not specifically include requirements for the ESFAS automatic actuation logic channels, including actions when one or more automatic actuation logic channels are inoperable. However, Surveillance Requirements associated with the ESFAS automatic actuation logic is included in the Unit 1 CTS. Because no actions are provided for the Unit 1 ESFAS automatic actuation logic channels, a plant shutdown is required when an automatic actuation channel is inoperable. When an ESFAS automatic actuation logic channel is inoperable, Unit 1 ITS actions allow restoring a channel to OPERABLE status within 48 hours or in accordance with the RICT Program consistent with the Unit 2 ITS actions. This changes the Unit 1 CTS by providing time to restore the redundant automatic actuation logic channel to OPERABLE status provided the associated risk is assessed and managed in accordance with an NRC approved RICT Program.

License Amendments 247 and 199, dated July 2, 2019, for PSL Unit 1 and Unit 2, respectively (NRC ADAMS Accession No. ML19113A099) incorporated an NRC approved RICT Program in the PSL Unit 1 and Unit 2 technical specifications. The RICT Program provides controls to assess and manage risk during the extended time to restore the redundant automatic actuation logic channel or manual actuation channel to OPERABLE status.

FPL has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS ITS 3.3.4, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM (ESFAS) LOGIC AND MANUAL ACTUATION

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

   Response: No.

   The proposed change does not affect accident initiators or precursors nor adversely alter the design assumptions, conditions, and configuration of the facility. The proposed change does not alter any plant equipment or operating practices with respect to such initiators or precursors in a manner that the probability of an accident is increased. In addition, the actions continue to provide sufficient remedial measures to continue safe operation in lieu of a plant shutdown. The proposed change does not involve a physical change to the ESFAS, nor does it change the safety function of the ESFAS instrumentation or the equipment supported by the ESFAS instrumentation.

   The proposed change permits the extension of the time to restore the redundant automatic actuation logic channel or manual actuation channel to OPERABLE status provided the associated risk is assessed and managed in accordance with an NRC approved RICT Program. The proposed change does not involve a significant increase in the probability of an accident previously evaluated because the change involves no change to the plant or its modes of operation. The proposed change does not increase the consequences of an accident because the design basis mitigation function of the ESFAS instrumentation and supported systems is not changed and the consequences of an accident during the extended Completion Time are no different from those during the existing Completion Time

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   With respect to a new or different kind of accident, there are no proposed design changes to the ESFAS; nor are there any changes in the method by which safety related plant structures systems and components perform their specified safety functions. The proposed change will not affect the method of plant operation or revise any operating parameters. No new accident scenarios, transient precursor, failure mechanisms, or limiting single failures will be introduced as a result of this proposed change and the failure modes and effects analyses of SSCs important to safety are not altered as a result of this change.

   The proposed change does not alter the design or performance of the ESFAS, rather, the change permits the extension of the time to restore the redundant automatic actuation logic channel or manual actuation channel to OPERABLE status provided the associated risk is assessed and managed in accordance with an NRC approved RICT Program. The proposed actions provide sufficient remedial measures to continue safe operation in lieu of a plant shutdown. The process to return inoperable instrumentation to service or place the unit in a shutdown condition uses current procedures, methods, and processes already established and currently in use and, therefore, does not constitute a new type of test.

No changes are being proposed to the procedures that operate the plant equipment and the change does not have a detrimental impact on the manner in which plant equipment operates or responds to an actuation signal.

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

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

   Response: No.

   The margin of safety is related to the ability of the fission product barriers to perform their design functions during and following an accident. These barriers include the fuel cladding, the reactor coolant system, and the containment. The performance of these fission product barriers is not affected by the proposed change.

   Instrumentation safety margin is established by ensuring the limiting safety system settings (LSSSs) automatically actuate the applicable design function to correct an abnormal situation before a safety limit is exceeded. Safety analysis limits are established for reactor trip system and ESFAS instrumentation functions related to those variables having significant safety functions. The proposed actions provide sufficient remedial measures to continue safe operation in lieu of a plant shutdown. In addition, the change does not allow continued operation with a loss of the actuation capability, and therefore, does not alter the capability of the LSSSs to automatically actuate the applicable design function to correct an abnormal situation before a safety limit is exceeded.

   The proposed change does not alter the instrumentation used to monitor a plant variable on which a safety limit has been placed. The change permits the extension of the time to restore the redundant automatic actuation logic channel or manual actuation channel to OPERABLE status provided the associated risk is assessed and managed in accordance with an NRC approved RICT Program.

   The controlling parameters established to actuate supporting systems during an accident or transient are not affected by the proposed change and no design basis or safety limit is altered as a result of the proposed change. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above analysis, FPL concludes that the proposed change does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of no significant hazards consideration is justified.

ATTACHMENT 5

3.3.5, Diesel Generator (DG) – Loss of Voltage Start (LOVS)

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

See ITS 3.3.3

LCO 3.3.5 ~~3.3.2.1~~ The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and bypasses shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4~~. LA01

Add proposed ITS 3.3.5 Applicability: When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown." M01

LCO 3.3.5 Applicability **APPLICABILITY:** As shown in Table 3.3-3.

Add proposed ITS 3.3.5 ACTIONS Note A02

ACTION:

SR 3.3.5.3
ACTION A for Table 3.3.3-1 Functions 6.a, 6.b, 6.c
SR 3.3.5.3

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTION A for Table 3.3.3-1 Functions 6.a, 6.b, 6.c

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

Add proposed ITS 3.3.5 ACTION B and C L01

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1, SR 3.3.5.2, SR 3.3.5.3

~~4.3.2.1.1~~ Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the modes ~~and at the frequencies~~ shown in Table 4.3-2. In accordance with the Surveillance Frequency Control Program

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

See ITS 3.3.3

~~4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. Each test shall include at least one channel per function.~~ A03

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA02

~~MINIMUM~~ REQUIRED A04

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	8
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	13
6. LOSS OF POWER					
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	~~2/Bus~~	~~2/Bus~~	2 ~~1~~/Bus	1, 2, 3	12
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	~~2/Bus~~	~~2/Bus~~	2 ~~1~~/Bus	1, 2, 3	12
c. 480 V Emergency Bus Under-voltage (Degraded Voltage)	~~2/Bus~~	~~2/Bus~~	2 ~~1~~/Bus	1, 2, 3	12
7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	11
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	11
c. SG Level (1A/1B) - Low	4/SG	2/SG	3/SG	1, 2, 3	14a, 14b, 15
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 1A – SG 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	14a, 14b, 15
b. Feedwater Header 1A – 1B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	14a, 15

See ITS 3.3.4 ITS 3.3.3

See ITS 3.3.4 ITS 3.3.3

See ITS 3.3.4 ITS 3.3.3

LCO 3.3.5 Loss of Voltage ACTION A

LCO 3.3.5 Degraded Voltage ACTION A

LCO 3.3.5 Degraded Voltage ACTION A

v

Add proposed ITS 3.3.5 Applicability: When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown." M01

Add proposed ITS 3.3.5 ACTION B and C L01

TABLE 3.3-3 (continued)

TABLE NOTATION

ACTION 10A - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

See ITS 3.3.3

a. The inoperable channel is placed in the bypassed or tripped condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour. If the inoperable channel can not be restored to OPERABLE status within 48 hours, then place the inoperable channel in the tripped condition.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

ACTION 10B - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.4

ACTION A

ACTION 12 - ~~With the number of OPERABLE Channels one less than the Total Number of Channels,~~ ~~operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST~~ ~~provided the inoperable~~ channel ~~is~~ place~~d~~ in ~~the~~ trip~~ped~~ ~~condition~~ within 1 hour.

L02

ACTION A (Condition)

One or more Functions with one channel per DG inoperable.

Add proposed ITS 3.3.5 ACTIONS Note

A02

Add proposed ITS 3.3.5 ACTION B and C

L01

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

	FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES	
	6. LOSS OF POWER			
SR 3.3.5.3	a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	~~≥ 2900 volts with a 1 ± .5 second time delay~~	≥ 2900 volts with a 1 ± .5 second time delay	
SR 3.3.5.3	b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	~~≥ 3831 volts with a 18 ± 2 second time delay~~	≥ 3831 volts with a 18 ± 2 second time delay	
SR 3.3.5.3	c. 480 volts Emergency Bus Undervoltage (Degraded Voltage)	~~≥ 415 volts with a ≤ 9 second time delay~~	≥ 415 volts with a ≤ 9 second time delay	
	7. AUXILIARY FEEDWATER (AFAS)			See ITS 3.3.4
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	
	b. Automatic Actuation Logic	Not Applicable	Not Applicable	
Table 3.3.3-1 6.a. 6.b	c. SG 1A & 1B Level Low	≥ 19.0%	≥ 18.0 %	
	8. AUXILIARY FEEDWATER ISOLATION			See ITS 3.3.3
	a. Steam Generator ΔP – High	≤ 275 psid	89.2 to 281 psid	
	b. Feedwater Header High ΔP	≤ 150.0 psid	56.0 to 157.5 psid	

Add proposed ITS 3.3.5 Applicability:
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

M01

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
	6. LOSS OF POWER					
SR 3.3.5.3	a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.5.3	b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
SR 3.3.5.3	c. 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3	
	7. AUXILIARY FEEDWATER (AFAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
	b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
	8. AUXILIARY FEEDWATER ISOLATION					
	a. SG Level (A/B) – Low and SG Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (BtoA/AtoB) – High	N.A.	SFCP	SFCP	1, 2, 3	

INSTRUCTION

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.5

~~3.3.2~~ The Engineered Safety Features Actuation System (ESFAS) instrumentation channels bypasses shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4~~.

See ITS 3.3.3

LA01

LCO 3.3.5 Applicability

APPLICABILITY: As shown in Table 3.3-3.

Add proposed ITS 3.3.5 Applicability: When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

M01

Add proposed ITS 3.3.5 ACTIONS Note

A02

ACTION:

SR 3.3.6.3

ACTION A for Table 3.3.3-1 Function 6.a.(1)
ACTION B for Table 3.3.3-1 Function 6.a.(2), 6.b.(1), 6.b.(2)

SR 3.3.6.3

~~a.~~ With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, ~~declare the channel inoperable and~~ apply the applicable ACTION requirement of Table 3.3-3 ~~until the channel is restored to OPERABLE status~~ with the trip setpoint adjusted consistent with the Trip Setpoint value.

ACTION A for Table 3.3.3-1 Function 6.a.(1)
ACTION B for Table 3.3.3-1 Function 6.a.(2), 6.b.(1), 6.b.(2)

~~b.~~ With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

Add proposed ITS 3.3.5 ACTION C and D

L01

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1, SR 3.3.5.2, SR 3.3.5.3

~~4.3.2.1~~ Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES ~~and at the frequencies~~ shown in Table 4.3-2.

In accordance with the Surveillance Frequency Control Program

4.3.2.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

See ITS 3.3.3

~~4.3.2.3~~ ~~The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit in accordance with the Surveillance Frequency Control Program. Each test shall include at least one channel per function.~~

A03

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LA02 A04 M01

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	REQUIRED APPLICABLE MODES	ACTION
6. LOSS OF POWER (LOV)			Add proposed ITS 3.3.5 Applicability: When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."		
LCO 3.3.5 Loss of Voltage ACTION A — a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	~~2/Bus~~	~~2/Bus~~	2 ~~1~~/Bus	1, 2, 3	17A
LCO 3.3.5 Loss of Voltage ACTION B — (2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	~~3/Bus~~	~~2/Bus~~	3 ~~2~~/Bus	1, 2, 3	17B
LCO 3.3.5 Degraded Voltage ACTION B — b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	~~3/Bus~~	~~2/Bus~~	3 ~~2~~/Bus	1, 2, 3	17B
LCO 3.3.5 Degraded Voltage ACTION B — (2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	~~3/Bus~~	~~2/Bus~~	3 ~~2~~/Bus	1, 2, 3	17B
7. AUXILIARY FEEDWATER (AFAS)					
a. Manual (Trip Buttons)	4/SG	2/SG	4/SG	1, 2, 3	15
b. Automatic Actuation Logic	4/SG	2/SG	3/SG	1, 2, 3	15
c. SG Level (2A/2B) – Low	4/SG	2/SG	3/SG	1, 2, 3	20a, 20b, 21
8. AUXILIARY FEEDWATER ISOLATION					
a. SG 2A – SG 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	20a, 20b, 21
b. Feedwater Header 2A – 2B Differential Pressure	4/SG	2/SG	3/SG	1, 2, 3	20a, 21

See ITS 3.3.4 (items 7.a, 7.b)

See ITS 3.3.3 (item 7.c)

See ITS 3.3.3 (items 8.a, 8.b)

Add proposed ITS 3.3.5 ACTION C and D L01

A01

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 14 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

See ITS 3.3.3

a. Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour.

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below.

Process Measurement Circuit	Functional Unit Bypassed/Tripped
1. Containment Pressure -	Containment Pressure – High (SIAS, CIAS, CSAS) Containment Pressure – High (RPS)
2. Steam Generator Pressure -	Steam Generator Pressure – Low (MSIS) AFAS-1 and AFAS-2 (AFAS) Thermal Margin/Low Pressure (RPS) Steam Generator Pressure – Low (RPS)
3. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)
4. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Pressurizer Pressure – Low (SIAS) Thermal Margin/Low Pressure (RPS)

ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.4

ACTION 16 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION A

ACTION A Note

ACTION 17A - ~~With the number of OPERABLE Channels one less than the Total Number of Channels,~~ restore the inoperable channel to OPERABLE status within 48 hours or place ~~the inoperable~~ channel in ~~the~~ trip~~ped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated~~ within ~~1~~ hour; one ~~additional~~ channel may be bypassed for up to 2 hours for surveillance testing ~~per Specification 4.3.2.1.~~

48 s

M02

One 4.16 kV Loss of Voltage Function with one channel per DG inoperable.

Add proposed ITS 3.3.5 ACTIONS Note A02

Add proposed ITS 3.3.5 ACTIONS C and D L01

A01

TABLE 3.3-3 (Continued)

TABLE NOTATION

One or more Functions with one channel per DG inoperable (except 4.16 kV Loss of Voltage Function).

ACTION B

ACTION 17B - ~~With the number of OPERABLE Channels one less than the Total Number of Channels,~~ restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or place ~~the inoperable~~ channel in ~~the~~ trip~~ped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated~~ within ~~1~~ 48 hour~~;~~ s one ~~additional~~ channel may be bypassed for up to 2 hours for surveillance testing ~~per Specification 4.3.2.1~~.

ACTION B Note

M02

See ITS 3.3.3

ACTION 18A - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour. If the inoperable channel can not be restored to OPERABLE status within 48 hours, then place the inoperable channel in the tripped condition.

b. With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed in ACTION 13.

ACTION 18B - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time Program, or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 19 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. Within 1 hour the inoperable channel is placed in either the bypassed or tripped condition. If OPERABILITY cannot be restored within 48 hours or in accordance with the Risk Informed Completion Time Program, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

LA01

	FUNCTIONAL UNIT	TRIP VALUE	ALLOWABLE VALUES	
	5. CONTAINMENT SUMP RECIRCULATION (RAS)			
	a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
	b. Refueling Water Tank – Low	5.67 feet above tank bottom	4.62 feet to 6.24 feet above tank bottom	See ITS 3.3.3
	c. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	6. LOSS OF POWER			
SR 3.3.5.3	a. (1) 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	~~> 3120 volts~~	> 3120 volts	
SR 3.3.5.3	(2) 480 V Emergency Bus Undervoltage (Loss of Voltage)	~~> 360 volts~~	> 360 volts	
SR 3.3.5.3	b. (1) 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	~~> 3848 volts with < 10-second time delay~~	> 3848 volts with < 10-second time delay	
SR 3.3.5.3	(2) 480 V Emergency Bus Undervoltage (Degraded Voltage)	~~> 432 volts~~	> 432 volts	
	7. AUXILIARY FEEDWATER (AFAS)			
	a. Manual (Trip Buttons)	Not Applicable	Not Applicable	See ITS 3.3.4
	b. Automatic Actuation Logic	Not Applicable	Not Applicable	See ITS 3.3.4
	c. SG 2A & 2B Level Low	> 19.0%	> 18.0 %	See ITS 3.3.3
	8. AUXILIARY FEEDWATER ISOLATION			
	a. Steam Generator ΔP – High	< 275 psid	89.2 to 281 psid	See ITS 3.3.3
	b. Feedwater Header ΔP – High	< 150.0 psid	56.0 to 157.5 psid	See ITS 3.3.3

M01

Add proposed ITS 3.3.5 Applicability:
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	6. LOSS OF POWER (LOV)					
SR 3.3.5.3	a. 4.16 kV and 480 V Emergency Bus Undervoltage (Loss of Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	
SR 3.3.5.3	b. 4.16 kV and 480 V Emergency Bus Undervoltage (Degraded Voltage)	SFCP	SFCP	SFCP	1, 2, 3, 4	
	7. AUXILIARY FEEDWATER (AFAS)					
	a. Manual (Trip Buttons)	N.A.	N.A.	SFCP	1, 2, 3	See ITS 3.3.4
	b. SG Level (A/B) – Low	SFCP	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	c. Automatic Actuation Logic	N.A.	N.A.	SFCP(1), SFCP(2)	1, 2, 3	See ITS 3.3.4
	8. AUXILIARY FEEDWATER ISOLATION					
	a. SG Level (A/B) – Low and SG Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	See ITS 3.3.3
	b. SG Level (A/B) – Low and Feedwater Header Differential Pressure (B to A/A to B) – High	N.A.	SFCP	SFCP	1, 2, 3	

TABLE NOTATION

See ITS 3.3.4

(1) Testing of Automatic Actuation Logic shall include energization/de-energization of each initiation relay (solid-state component) and verification of the OPERABILITY of each initiation relay (solid-state component).

(2) An actuation relay test shall be performed which shall include the energization/de-energization of each actuation relay and verification of the OPERABILITY of each actuation relay.

(3) A subgroup relay test shall be performed which shall include the energization/de-energization of each subgroup relay and verification of the OPERABILITY of each subgroup relay. Testing of the ESFAS subgroup relays shall be performed in accordance with the Surveillance Frequency Control Program.

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2, Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications-Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-3 Actions describe the Actions to be taken when diesel generator (DG) loss of voltage start (LOVS) Function instrument channels are inoperable. ITS 3.3.5 also describes Actions to be taken when DG – LOVS Function instrument channels are inoperable and contains a note that separate condition entry is allowed for each DG – LOVS Function. This changes the CTS by adding a Note stating that separate condition entry is allowed for each Function, those Functions being DG – LOVS 4.16 kV and 480 V loss of voltage and degraded voltage Functions.

The purpose of the CTS Actions is to provide the appropriate compensatory actions for inoperable DG-LOVS Functions. This proposed change will allow separate condition entry for each DG-LOVS Function. The Note clarifies that DG-LOVS Functions are treated as separate entities, each with separate Completion Times. The Conditions of this Specification may be entered independently for each DG-LOVS Function in the LCO. Completion Times for the inoperable channel of a Function will be tracked separately. These changes are acceptable since the proposed Required Actions provide sufficient time to satisfy the Required Actions. Inoperable instrument channels are normally found one at a time, not concurrently. Therefore, the Actions to be taken when DG-LOVS Function instrument channels are inoperable apply as each Function is found to be inoperable and not at the same time. This change is designated as an administrative change and is acceptable because it does not result in technical changes to the CTS.

A03 Unit 1 CTS 4.3.2.1.3 and Unit 2 CS 4.3.2.3 require ENGINEERED SAFETY FEATURES RESPONSE TIME testing of "each" ESFAS function. ITS 3.3.5 does not include response time testing for the DG-LOVS Instrumentation Functions. This changes the CTS by clearly identifying that the ENGINEERED SAFETY FEATURES RESPONSE TIME testing does not apply to the DG-LOVS Instrumentation Functions.

The purpose of Unit 1 CTS 4.3.2.1.3 and Unit 2 CTS 4.3.2.3 is to ensure that the actuation response times, when applicable to a Function, are less than or equal to the maximum values assumed in the accident analysis. The Unit 1 UFSAR Table 13.8.2-2, states that the ENGINEERED SAFETY FEATURES RESPONSE TIME testing is not applicable to the 4.16 kV Loss of Voltage and Degraded Voltage Functions, and the 480 V Degraded Voltage Function. The Unit 2 UFSAR Table 13.7.2-2, states that the ENGINEERED SAFETY FEATURES RESPONSE TIME testing is not applicable to the 4.16 kV Loss of Voltage and

Degraded Voltage Functions, and the 480 V Loss of Voltage and Degraded Voltage Functions. The response time surveillance test acceptance criteria for Technical Specification 3/4.3.2 was relocated by License Amendment No. 128 (Unit 1) and License Amendment No. 67 (Unit 2) and NRC Safety Evaluation dated July 12, 1994. The measurement of engineered safety features actuation systems instrumentation response times at the specified frequencies provides assurance that the ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit is taken in the analyses for those channels with response times indicated as not applicable. Therefore, this change is acceptable since ENGINEERED SAFETY FEATURES RESPONSE TIME testing of the Loss of Voltage and Degraded Voltage Functions is not required. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS 3.3.5 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. DOC LA01 describes the change that moves the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases. This changes the CTS by changing the "MINIMUM CHANNELS OPERABLE" column to "REQUIRED CHANNELS OPERABLE" and changes the number of channels to 2 per bus for Unit 1 Functional Units 6.a, 6.b, ad 6.c, and changes the number of channels to 2 per bus for Unit 2 Functional Unit 6.a.(1) and to 3 per bus for Unit 2 Functional Units 6.a.(2), 6.b.(1), and 6.b.(2). Additionally, the revised "MINIMUM CHANNELS OPERABLE" criteria are moved to the ITS 3.3.5 LCO statement and the "MINIMUM CHANNELS OPERABLE" column is deleted from CTS Table 3.3-3. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS Tables 3.3-3 and 4.3-2 requirements for the Degraded Voltage and Loss of Voltage Functional Units are applicable in MODES 1, 2, and 3. ITS 3.3.5 requires the Degraded Voltage and Loss of Voltage Functions to be OPERABLE in MODES 1, 2, 3, and 4, and When the associated EDG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown." This changes the CTS by expanding the conditions under which the Degraded Voltage and Loss of Voltage Functions must be OPERABLE.

This change is acceptable because requiring the Degraded Voltage and Loss of Voltage Functions to be OPERABLE when LCO 3.8.2 requires an EDG to be OPERABLE ensures that the automatic loss of power start of the EDG is available when needed. This change is designated as more restrictive because it expands the applicability in which equipment is required to be OPERABLE.

M02 **Unit 2 only:** *(Category 3 - Relaxation of Completion Time)* CTS Table 3.3-3 Action 17A requires that, with the number of OPERABLE channels one less than the total number of channels per DG, restore the inoperable channel to

OPERABLE status within 48 hours (2 channels per DG Function) or place the inoperable channel in trip within 1 hour. Action 17A applies to the 2 channels per DG 4.16 kV Loss of Voltage Function. CTS Table 3.3-3 Action 17B requires that, with the number of OPERABLE channels one less than the total number of channels per DG, restore the inoperable channel to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time (3 channels per DG Functions), or place the inoperable channel in trip within 1 hour. Action 17B applies to the 3 channels per DG 4.16 kV Degraded Voltage Function, 3 channels per DG 480 Loss of Voltage Function, and 3 channels per DG 480V Degraded Voltage Function.

ITS 3.3.5 retains the current licensing basis with time allotted to restore the inoperable channel to OPERABLE status before requiring the inoperable channel be placed in trip. ITS 3.3.5 ACTION A is consistent with CTS Action 17A. ITS 3.3.5 ACTION B is consistent with CTS Action 17B. The CTS Actions use an "or" connector. ITS ACTIONS that use an "OR" connector use the same Completion Time. This changes the CTS by eliminating the allowance to place the channel in trip within 1 hour after the channel is not restored within the required Completion Time and instead requires the channel to be placed in trip within 48 hours (ACTION A), and within the same 48 hours or in accordance with the Risk Informed Completion Time (ACTION B), consistent with the time currently allotted to restore the inoperable channel to OPERABLE status. If the actions (i.e., restore or trip the inoperable channel) cannot be completed within the required Completion Time, the associated DG must be immediately declared inoperable. This change is acceptable because if the inoperable channel is not restored to OPERABLE status within the associated Completion Time, the channel is placed in trip. However, the ITS 3.3.5 time to trip the channel is 1 hour less than the time allotted in CTS. If the inoperable channel is not restored to OPERABLE status with 48 hours (ACTION A), or within 48 hours or in accordance with the Risk Informed Completion Time (ACTION B), the DG is immediately declared inoperable (ACTION D). This change is designated as more restrictive because it reduces the Completion Time for a CTS Required Action.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.2.1 Table 3.3-4, ESFAS Instrumentation Trip Values, has two columns stating trip setpoints and allowable values for each Function. Unit 1 CTS 3.3.2.1 and Unit 2 CTS 3.2.1 require the ESFAS instrumentation setpoints to be set consistent with the Trip Setpoint values shown in Table 3.3-4. However, the CTS Action is only required to be taken when the setpoint is less conservative than the Allowable Value column of Table 3.3-4. When the setpoint is less conservative than the Allowable Value, the channel is to be declared inoperable and adjusted consistent with the

Trip Setpoint value. CTS Table 3.3-4 specifies both the Trip Setpoints and Allowable Values for the ESFAS Actuation Instrumentation DG-LOVS Functional Units. ITS 3.3.5 requires the instrumentation for each DG-LOVS Function in the LCO to be OPERABLE. ITS SR 3.3.5.3 specifies only the Allowable Values for the DG-LOVS Instrumentation Functions. The Allowable Values represent the OPERABILITY limit of the channels in ITS. This changes the CTS by moving the Trip Setpoints to the Technical Requirements Manual (TRM).

The purpose of the trip setpoint requirements is to ensure required automatic safety systems are actuated to protect against violating core design limits, breaching the Reactor Coolant System pressure boundary, and to mitigate accidents. Pursuant to 10 CFR 50.36(c)(1)(ii)(A), if it is determined that an automatic protective device for a variable on which a safety limit has been placed (i.e., limiting safety system setting) does not function as required, appropriate action is taken to ensure the abnormal situation is corrected before a safety limit is exceeded, which may include shutting down the reactor. The PSL Instrument Setpoint Methodology calculates nominal trip setpoints (NTSPs) using methods consistent with the guidance provided in NRC Regulatory Guide 1.105,"Setpoints For Safety-Related Instrumentation," and ANSI/ISA Standard 67.04, "Setpoints for Nuclear Safety-Related Instrumentation." Additionally, pre-defined limits (double-sided Operability limits and as-left limits) are determined for each instrument consistent with the guidance provided in NRC Regulatory Guide 1.105 and ANSI/ISA–RP67.04, "Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation." The instrument Operability limit band in plant uncertainty calculations is synonymous with the as-found acceptance criteria band specified in ITS and is centered about the nominal equipment setting (clarified in calculations as the field trip setpoint or NTSP). The PSL Instrument Setpoint Methodology, including the method of determining instrument uncertainties, was reviewed by the NRC during the review of Extended Power Uprate (EPU) as documented in the EPU safety evaluations for License Amendments 213 (Unit 1) and 163 (Unit 2), dated July 9, 2012 and September 4, 2012, respectively (NRC ADAMS Accession Nos. ML12181A019 and ML12235A463). The NRC staff determined that the PSL Instrument Setpoint Methodology described in the EPU license request meets the requirements of 10 CFR 50, Appendix A, General Design Criterion 13 and the regulatory guidance in RG 1.105 (EPU SE pg. 92 (Unit 1) and 95 (Unit 2)). The NRC staff also determined that the application of the clarifications of RG 1.105 in Regulatory Issue Summary 2006-17 "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," is acceptable (EPU SE pg. 94 (Unit 1) and 97 (Unit 2)).

The removal of these details for meeting Technical Specification requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Allowable Values associated with the DG-LOVS Instrumentation, which are designated as the Operability limits for the required instrument Functions. Also, this change is acceptable because these types of procedural details will be adequately controlled in the TRM. Any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA02 CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS 3.3.5 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases. The MINIMUM CHANNELS OPERABLE" column is deleted as described in discussion of change (DOC) A03.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS 3.3.5 LCO still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 4 – Relaxation of Required Action)* Unit 1 CTS Table 3.3-3 Functional Units 6.a - 4.16 kV Loss of Voltage, 6.b – 4.16 kV Degraded Voltage, and 6.c – 480 V Degraded Voltage require 2 channels per DG for each Function. Unit 2 CTS Table 3.3-3 Functional Units 6.a.(1) - 4.16 kV Loss of Voltage requires 2 channels per DG. Unit 2 CTS Functional Units 6.a.(2) 480 V Loss of Voltage, 6.b.(1) – 4.16 kV Degraded Voltage, and 6.b.(2) – 480 V Degraded Voltage each require 3 channels per DG. However, CTS Table 3.3-3 only describes the Actions to be taken when one channel per DG is inoperable for a DG-LOVS Function. ITS LCO 3.3.5 states the DG-LOVS Functions and maintains the same operable channels per DG requirements as CTS. ITS also provides actions to be taken when one diesel generator (DG) loss of voltage start (LOVS) Function instrument channel is inoperable (Unit 1 ACTION A and Unit 2 ACTIONS A and B). Note that the Unit 2 DG-LOVS Function channel operability requirements differ for the Unit 2 CTS Functional Units: 6.a.(1)) - 4.16 kV Loss of Voltage requires 2 channels per DG (Unit 2 ACTION A), and Functional Units 6.a.(2) 480 V Loss of Voltage, 6.b.(1) – 4.16 kV Degraded Voltage, and 6.b.(2) – 480 V Degraded Voltage each require 3 channels per DG (Unit 2 ACTION B).

Additionally, ITS provides Actions for one or more DG-LOVS Functions with two channels per DG inoperable requiring one inoperable channel be restored to

OPERABLE status within 1 hour (Unit 1 ACTION B and Unit 2 ACTION C). ITS also provides Actions if the Required Actions and Associated Completion Times are not met requiring the associated DG be declared inoperable immediately (Unit 1 ACTION C and Unit 2 ACTION D). For CTS, if one or more Functions with two or more channels per DG are inoperable, or if the Required Action is not Completed in the associated Completion Time, CTS 3.0.3 is entered since there is no Condition and Action specified in the CTS. This changes the CTS by explicitly providing an ACTION for one or more Functions with two or more channels per DG inoperable, and an ACTION if the Required Action is not Completed in the associated Completion Time.

The purpose of CTS is to ensure that the LOVS-DG logic is in a known configuration either by restoring the inoperable channel to OPERABLE status or by placing the inoperable channel in trip. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the allowed Completion Time. ITS 3.3.5 retains the CTS requirement to either restore the inoperable channel to OPERABLE status or place the channel in trip when one or more Functions with one channel per DG inoperable. Additionally, ITS provides Actions for one or more DG-LOVS Functions with two channels per DG inoperable requiring one inoperable channel be restored to OPERABLE status within 1 hour (Unit 1 ACTION B and Unit 2 ACTION C). ITS also provides Actions if the Required Actions and Associated Completion Times are not met requiring the associated DG be declared inoperable immediately (Unit 1 ACTION C and Unit 2 ACTION D). This change is designated as less restrictive because the ITS Actions are less restrictive than the CTS Actions.

L02 **Unit 1 only:** *(Category 4 - Relaxation of Required Action)* CTS Table 3.3-3 Action 12 states, in part, that with the number of OPERABLE channels one less than the total number of channels, "operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST." This CTS Action applies to the Loss of Voltage and Degraded Voltage Functions of CTS Table 3.3-3. ITS 3.3.5 ACTION A is the applicable action for the Loss of Voltage and Degraded Voltage Functions when one channel is inoperable, and does not include the restoration time limit of "until performance of the next required CHANNEL FUNCTIONAL TEST." This changes the CTS by allowing operation with an inoperable channel for an unlimited amount of time provided the inoperable channel is in the tripped condition.

The purpose of CTS Table 3.3-3 Action 12 is to only allow operation until performance of the next required CHANNEL FUNCTIONAL TEST. This requirement is based upon the assumption that when it is time to test the other OPERABLE channels in the associated Function, the OPERABLE channels cannot be tested with the inoperable channel in trip. However, CTS 3.0.6 (ITS LCO 3.0.5) is a generic allowance that will allow the inoperable channel to be restored to service in order to perform Surveillances on the other OPERABLE channels in the associated Function. Thus, using this generic allowance, it is possible to test the remaining OPERABLE channels in the associated Function, and there is no reason to restrict the generic allowance from applying to these specific channels. As such, the CTS Table 3.3-3 Action 12 statement is not necessary and has been deleted. The administrative controls required by ITS LCO 3.0.5 will ensure the time the channel is returned to service in conflict with the requirements of ITS 3.3.5 ACTION A is limited to the time absolutely necessary to perform the required testing to demonstrate OPERABILITY of the other channels. In addition, this specific example (taking an inoperable channel out of the tripped condition) is discussed in the Bases of ISTS SR 3.0.5. Therefore, this change is acceptable for the above described reasons. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.3 INSTRUMENTATION ~~(Analog)~~ 3

3.3.~~6~~ Diesel Generator (DG) - Loss of Voltage Start (LOVS) ~~(Analog)~~ 3 3

5 5

3.3.2.1
Table 3.3-3
Functional Unit
6.a, 6.b, 6.c

LCO 3.3.~~6~~ INSERT 1 ~~[Four] channels of Loss of Voltage Function and [four] channels of Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.~~ 3 2

Table 3.3-3
Functional Unit
6.a, 6.b, 6.c
DOC M01

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

DOC A02

--NOTE--
Separate Condition entry is allowed for each Function.

Table 3.3-3
Action 12

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per DG inoperable.	A.1 Place channel in ~~bypass o~~r trip. ~~AND~~ ~~A.2.1 Restore channel to OPERABLE status.~~ ~~OR~~	1 hour 1 ~~[48] hours~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2 2

1

INSERT 1

Table 3.3-3
Functional Unit
6.a, 6.b, 6.c

The following DG-LOVS Function instrumentation shall be OPERABLE:

a. Two channels of 4.16 kV Loss of Voltage Function per DG;

b. Two channels of 4.16 kV Degraded Voltage Function per DG;

c. Two channels of 480 V Degraded Voltage Function per DG.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~A.2.2 [Place the channel in trip.~~	~~48 hours~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
DOC L01 B. One or more Functions with two channels per DG inoperable.	B.1 ~~Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation.~~ ~~OR~~ ~~B.2.1 Place one channel in bypass and the other channel in trip.~~ ~~AND~~ ~~B.2.2~~ Restore one channel to OPERABLE status.	1 hour 1 ~~1 hour~~ 1 ~~[48] hours~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2
~~C. One or more Functions with more than two channels inoperable~~.	~~C.1 Restore all but two channels to OPERABLE status.~~	~~1 hour~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2

ACTIONS (continue)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	C ~~D~~. Required Action and associated Completion Time not met.	C ~~D~~.1 ~~Enter applicable Conditions and Required Actions for the~~ Declare associated DG ~~made~~ inoperable ~~by DG - LOVS instrumentation~~.	Immediately	[1]

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.3.2.1.1 Table 4.3-2 Function 6.a, 6.b, 6.c	SR 3.3.~~6~~ 5.1	~~[~~ Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	[2] [2]
4.3.2.1.1 Table 4.3-2 Function 6.a, 6.b, 6.c	SR 3.3.~~6~~ 5.2	Perform CHANNEL FUNCTIONAL TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	[2] [2]

3

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.~~6~~.3 5	Perform CHANNEL CALIBRATION with setpoint Allowable Values as follows: ~~a. Degraded Voltage Function ≥ [3180] V and ≤ [3220] V~~ ~~Time delay: ≥ [ ] seconds and ≤ [ ] seconds at [ ] V and~~ ~~b. Loss of Voltage Function ≥ [3180] V and ≤ [3220] V~~ ~~Time delay: ≥ [ ] seconds and ≤ [ ] seconds at [ ] V.~~	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

4.3.2.1.1 Table 4.3-2 Function 6.a, 6.b, 6.c

2 1 1 2 1 1

Table 3.3-4 Function 6.a — a. 4.16 kV Loss of Voltage Function ≥ 2900 V

Time delay: 1 ± 0.5 seconds

Table 3.3-4 Function 6.b — b. 4.16 kV Degraded Voltage Function ≥ 3831 V

Time delay: 18 ± 2 seconds

Table 3.3-4 Function 6.c — c. 480 V Degraded Voltage Function ≥ 415 V

Time Delay: ≤ 9 seconds

3 1

3

3.3 INSTRUMENTATION ~~(Analog)~~

3

3.3.~~6~~ 5 Diesel Generator (DG) - Loss of Voltage Start (LOVS) ~~(Analog)~~

3

3.3.2.1 Table 3.3-3 Functional Unit 6.a.(1), 6.a.(2), 6.b.(1), 6.b.(2)

LCO 3.3.~~6~~ 5 INSERT 1 ~~[Four] channels of Loss of Voltage Function and [four] channels of Degraded Voltage Function auto-initiation instrumentation per DG shall be OPERABLE.~~

3 2

Table 3.3-3 Functional Unit 6.a.(1), 6.a.(2), 6.b.(1), 6.b.(2) DOC M01

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

DOC A02

-----NOTE-----
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-3 Action 17A A. One ~~or more~~ 4.16 kV Loss of Voltage Function~~s~~ with one channel per DG inoperable.	A.1 Place channel in ~~bypass or~~ trip. ~~AND~~ OR A.2.~~1~~ Restore channel to OPERABLE status. -----NOTE----- One channel may be bypassed for up to 2 hours for surveillance testing. ----- ~~OR~~	~~1 hour~~ 48 hours ~~[~~48~~]~~ hours ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~

1 1 2 2 2

INSERT 2

1 3

1

INSERT 1

Table 3.3-3
Functional Unit
6.a.(1), 6.a.(2),
6.b.(1), 6.b.(2)

The following DG-LOVS Function instrumentation shall be OPERABLE:

a. Two channels of 4.16 kV Loss of Voltage Function per DG;

b. Three channels of 4.16 kV Degraded Voltage Function per DG;

c. Three channels of 480 V Loss of Voltage Function per DG;

d. Three channels of 480 V Degraded Voltage Function per DG.

1

INSERT 2

Table 3.3-3
Action 17B

B. One or more Functions with one channel per DG inoperable (except 4.16 kV Loss of Voltage Function).	B.1 -------------NOTE---------------- One channel may be bypassed for up to 2 hours for surveillance testing. ------------------------------------- Place channel in trip.	48 hours <u>OR</u> In accordance with the Risk Informed Completion Time Program
	<u>OR</u>	
	B.2 Restore channel to OPERABLE status.	48 hours <u>OR</u> In accordance with the Risk Informed Completion Time Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~A.2.2 [Place the channel in trip.~~	~~48 hours~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]]~~ 2
DOC L01 ~~B~~ C. One or more Functions with two or more channels per DG inoperable.	~~B~~ C.1 ~~Enter applicable Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation~~. ~~OR~~ ~~B.2.1 Place one channel in bypass and the other channel in trip.~~ ~~AND~~ ~~B.2.2~~ Restore one channel to OPERABLE status.	1 hour 1 ~~1 hour~~ 1 ~~[48] hours~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2
~~C. One or more Functions with more than two channels inoperable~~.	~~C.1 Restore all but two channels to OPERABLE status.~~	~~1 hour~~ 2 ~~[OR~~ ~~In accordance with the Risk Informed Completion Time Program]~~ 2

3

ACTIONS (continue)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 D ~~D~~. Required Action and associated Completion Time not met.	D ~~D~~.1 ~~Enter applicable Conditions and Required Actions for the~~ Declare associated DG ~~made~~ inoperable ~~by DG - LOVS instrumentation~~.	Immediately 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.3.2.1 Table 4.3-2 Function 6.a, 6.b	SR 3.3.~~6~~.1 5	~~[~~ Perform CHANNEL CHECK.	~~[12 hours~~ 2 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~ 2
4.3.2.1.1 Table 4.3-2 Function 6.a, 6.b	SR 3.3.~~6~~.2 5	Perform CHANNEL FUNCTIONAL TEST.	~~[[92] days~~ 2 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 2

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
4.3.2.1.1 Table 4.3-2 Function 6.a, 6.b	SR 3.3.~~6~~.3 (5) Perform CHANNEL CALIBRATION with setpoint Allowable Values as follows: ~~a. Degraded Voltage Function ≥ [3180] V and ≤ [3220] V~~ ~~Time delay: ≥ [ ] seconds and ≤ [ ] seconds at [ ] V and~~ ~~b. Loss of Voltage Function ≥ [3180] V and ≤ [3220] V~~ ~~Time delay: ≥ [ ] seconds and ≤ [ ] seconds at [ ] V.~~	~~[[18] months~~ 2 ~~OR~~ 1 In accordance with the Surveillance Frequency Control Program ~~]~~ 2

Table 3.3-4 Function 6.a.(1) — a. 4.16 kV Loss of Voltage Function ≥ 3120 V

Table 3.3-4 Function 6.a.(2) — b. 480 V Loss of Voltage Function ≥ 360 V

Table 3.3-4 Function 6.b.(1) — c. 4.16 kV Degraded Voltage Function ≥ 3848 V

Time Delay: < 10 seconds

Table 3.3-4 Function 6.b.(2) — d. 480 V Degraded Voltage Function ≥ 432 V

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5, DIESEL GENERATOR (DG) – LOSS OF VOLTAGE START (LOVS)

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.6 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

3

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~6~~ Diesel Generator (DG) - Loss of Voltage Start (LOVS) ~~(Analog)~~
5

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or insufficiently stable to allow safe plant operation. Undervoltage protection will generate a LOVS in the event a Loss of Voltage or Degraded Voltage condition occurs. There are two LOVS Functions for each 4.16 kV vital bus.

INSERT 1

~~Four undervoltage relays with inverse time characteristics are provided on each 4.16 kV Class 1E instrument bus for the purpose of detecting a sustained undervoltage condition or a loss of bus voltage. The relays are combined in a two-out-of-four logic to generate a LOVS if the voltage is below 75% for a short time or below 90% for a long time. The LOVS initiated actions are described in Reference 1.~~ 1

Trip Setpoints and Allowable Values

The trip setpoints and Allowable Values are based on the analytical limits presented in Reference 2. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in SR 3.3.~~6~~.3 are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in Reference 3. The actual nominal trip setpoint is normally still more conservative than that required by the plant specific setpoint calculations. If the measured setpoint does not exceed the documented surveillance trip acceptance criteria, the undervoltage relay is considered OPERABLE.
5 5

Setpoints in accordance with the Allowable Values will ensure that the consequences of accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the accident and the equipment functions as designed.

~~The undervoltage protection scheme has been designed to protect the plant from spurious trips caused by the offsite power source. This is made possible by the inverse voltage time characteristics of the relays used.~~ A complete loss of offsite power will result in approximately a 1 second delay in LOVS actuation. The DG starts and is available to 1

1

INSERT 1

The 4.16 kV LOVS Functions include Loss of Voltage and Degraded Voltage Functions. The allowable values are provided in SR 3.3.5.3.

Each Class 1E 4.16 kV Bus utilizes two undervoltage definite time delay relays, in a 2-out-of-2 coincident logic for loss of voltage detection. The function of these relays is to initiate source disconnection, load shedding, diesel generator starting, and load sequencing on the effected train (bus). The LOVS initiated actions are described in Reference 1.

Each Class 1E 4.16 kV Bus utilizes two sets of 2 undervoltage definite time delay relays in a 2-out-of-2 coincident logic for degraded voltage detection. The function of these relays is the same as described for the loss of voltage detection.

Each Class 1E 480V Bus utilizes two undervoltage definite time delay relays in a 2-out-of-2 coincident logic scheme for degraded voltage detection.

BASES

BACKGROUND (continued)

accept loads within a 10 second time interval on the Engineered Safety Features Actuation System (ESFAS) or LOVS. Emergency power is established within the maximum time delay assumed for each event analyzed in the accident analysis (Ref. 2).

INSERT 2 ~~Since there are four protective channels in a two-out-of-four trip logic for each division of the 4.16 kV power supply, no single failure will cause or prevent protective system actuation. This arrangement meets IEEE Standard 279-1971 criteria (Ref. 4).~~ 1

APPLICABLE SAFETY ANALYSES

The DG - LOVS is required for Engineered Safety Features (ESF) systems to function in any accident with a loss of offsite power. Its design basis is that of the ESFAS.

Accident analyses credit the loading of the DG based on a loss of offsite power during a loss of coolant accident. The actual DG start has historically been associated with the ESFAS actuation. The diesel loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. ~~The analysis assumes a nonmechanistic DG loading, which does not explicitly account for each individual component of the loss of power detection and subsequent actions.~~ This delay time includes contributions from the DG start, DG loading, and Safety Injection System component actuation. The response of the DG to a loss of power must be demonstrated to fall within this analysis response time when including the contributions of all portions of the delay. 1

The required channels of LOVS, in conjunction with the ESF systems powered from the DGs, provide plant protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed. LOVS channels are required to meet the redundancy and testability requirements of GDC 21 in 10 CFR 50, Appendix A (Ref. ~~5~~ 6).

The delay times assumed in the safety analysis for the ESF equipment include the ~~[~~10~~]~~ second DG start delay and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay.

The DG - LOVS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO for the LOVS requires that ~~four~~ two channels per ~~bus~~ DG of each LOVS instrumentation Function be OPERABLE in MODES 1, 2, 3, and 4 and when the associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown." The LOVS supports safety systems associated 1

1

INSERT 2

The Class 1E 4.16 kV system and Class 1E 480 V system are designed to meet the single failure criteria as defined in IEEE 308 (Ref. 4) and IEEE 279 (Ref. 5). Specifically, any credible single failure shall not prevent the satisfactory performance of the minimum Class 1E 4.16kV loads or Class 1E 480 V loads required to achieve and maintain safe shutdown or to monitor or mitigate the consequences of any design basis accident or event. The worst case single failure will disable only one train of the Class 1E 4160V or Class 1E 480 V system.

BASES

LCO (continued)

with the ESFAS. In MODES 5 and 6, the ~~four~~ two channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start ovf the DG is available when needed.

~~Actions allow maintenance (trip channel) bypass of individual channels. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At plants where adequate channel to channel independence has been demonstrated, specific exceptions have been approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~ 1

~~Loss of LOVS Function could result in the delay of safety system initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an anticipated operational occurrence, the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump as well as an increased potential for a loss of decay heat removal through the secondary system.~~ 1

Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the plant specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable, provided that operation and testing are consistent with the assumptions of the plant specific setpoint calculation. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

~~[For this unit, the Bases for the Allowable Values and trip setpoints are as follows:]~~ 1

APPLICABILITY

The DG - LOVS actuation Function is required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE, so that it can perform its function on a loss of power or degraded power to the vital bus.

ACTIONS

A LOVS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint

BASES

ACTIONS (continued)

analysis. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. Determination of setpoint drift is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the instrument is set up for adjustment to bring it within specification. If the actual trip setpoint is not within the Allowable Value, the channel is inoperable and the appropriate Conditions must be entered.

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition entered. The required channels are specified on a per DG basis.

~~When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be entered immediately if applicable in the current MODE of operation.~~ 1

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this LCO may be entered independently for each Function. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function.

A.1~~, A.2.1, and A.2.2~~ 1

Condition A applies if one channel is inoperable for one or more Functions per DG bus.

If the channel cannot be restored to OPERABLE status, the affected channel should ~~either~~ be ~~bypassed or~~ tripped within 1 hour (Required Action A.1). 1

Placing the ~~this~~ channel in this ~~either~~ Condition ensures that logic is in a known configuration. In trip, the LOVS Logic is one-out-of-one ~~three~~. ~~In bypass, the LOVS Logic is two-out-of-three.~~ The 1 hour Completion Time is sufficient to perform the~~se~~ Required Action~~s~~. 1

~~Once Required Action A.1 has been complied with, Required Action A.2.1 allows [48] hours to repair the inoperable channel for those plants that have not demonstrated sufficient channel to channel independence on this Function. [Alternatively, a Completion Time can be determined in~~ 1

BASES

ACTIONS (continued)

~~accordance with the Risk Informed Completion Time Program.] If the channel cannot be restored to OPERABLE status, it must be tripped in accordance with Required Action A.2.2. The time allowed to repair or trip the channel is reasonable to repair the affected channel while ensuring that the risk involved in operating with the inoperable channel is acceptable. The [48] hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel is a rare event during any given [48] hour period. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

B.1~~, B.2.1, and B.2.2~~ 3

Condition B applies if two channels are inoperable for one or more Functions per DG.

If either ~~the~~ channel cannot be restored to OPERABLE status within 1 hour, Condition C is entered and the affected DG is declared inoperable. ~~the Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation are required to be entered. Alternatively, one affected channel is required to be bypassed and the other is tripped, in accordance with Required Action B.2.1. This places the Function in one-out-of-two logic.~~ The 1 hour Completion Time is sufficient to perform the Required Actions. 1 1

~~Once Required Action B.2.1 has been complied with, Required Action B.2.2 allows [48] hours to repair the bypassed or inoperable channel. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

After one channel is restored to OPERABLE status, the provisions of Condition A still apply to the remaining inoperable channel. ~~Therefore, the channel that is still inoperable after completion of Required Action B.2.2 shall be placed in trip if more than [48] hours have elapsed since the initial channel failure. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

~~C.1~~

~~Condition C applies when more than two undervoltage or Degraded Voltage channels on a single bus are inoperable.~~ 1

3

BASES

ACTIONS (continued)

~~Required Action C.1 requires all but two channels to be restored to OPERABLE status within 1 hour [or in accordance with the Risk Informed Completion Time Program]. With more than two channels inoperable, the logic is not capable of providing a DG - LOVS signal for valid Loss of Voltage or Degraded Voltage conditions. The 1 hour Completion Time is reasonable to evaluate and take action to correct the degraded condition in an orderly manner and takes into account the low probability of an event requiring LOVS occurring during this interval.~~ 1

C ~~D~~.1 3

Condition C ~~D~~ applies if the Required Actions and associated Completion Times are not met. 3

Required Action C ~~D~~.1 requires declaring ~~ensures that Required Actions for~~ the affected DG inoperab~~iliti~~e~~s are initiated~~. Depending upon plant MODE, the actions specified in LCO 3.8.1, "AC Sources - Operating," or LCO 3.8.2, "AC Sources - Shutdown", are required immediately. 3 1

1

SURVEILLANCE REQUIREMENTS

The following SRs apply to each DG - LOVS Function.

~~[~~ SR 3.3.5 ~~6~~.1 2 3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated output of the potential transformers that feed the LOVS undervoltage relays. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two channels could be an indication of excessive drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. ~~]~~ 2

~~[The Frequency, about once every shift, is based upon operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The~~ 2

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

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SR 3.3.~~6~~.2 3

A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any [92] day Frequency is a rare event. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~ 3

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. ~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~ 1

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SR 3.3.~~6~~.3 3

5

SR 3.3.~~6~~.3 is the performance of a CHANNEL CALIBRATION. The CHANNEL CALIBRATION verifies the accuracy of each component within the instrument channel. This includes calibration of the undervoltage relays and demonstrates that the equipment falls within the specified operating characteristics defined by the manufacturer.

The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. The~~re is a plant specific program which~~ Surveillance verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The setpoints, as well as the response to a Loss of Voltage and Degraded Voltage test, shall include a single point verification that the trip occurs within the required delay time as shown in Reference 1. ~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

BASES

REFERENCES

1. U FSAR, Section ~~[~~8.3~~]~~. 1 2
2. U FSAR, Chapter ~~[~~15~~]~~. 1 2
3. IC-3.17, FPL Setpoint Standard. ~~"Plant Protection System Selection of Trip Setpoint Values."~~
4. IEEE Standard 308-1971.
5 ~~4~~. IEEE Standard 279-1971.
6 ~~5~~. 10 CFR 50, Appendix A, GDC 21.

3

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~6~~ Diesel Generator (DG) - Loss of Voltage Start (LOVS) ~~(Analog)~~

5

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or insufficiently stable to allow safe plant operation. Undervoltage protection will generate a LOVS in the event a Loss of Voltage or Degraded Voltage condition occurs. There are two LOVS Functions for each 4.16 kV vital bus.

INSERT 1

~~Four undervoltage relays with inverse time characteristics are provided on each 4.16 kV Class 1E instrument bus for the purpose of detecting a sustained undervoltage condition or a loss of bus voltage. The relays are combined in a two-out-of-four logic to generate a LOVS if the voltage is below 75% for a short time or below 90% for a long time. The LOVS initiated actions are described in Reference 1.~~ 1

Trip Setpoints and Allowable Values

The trip setpoints and Allowable Values are based on the analytical limits presented in Reference 2. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in SR 3.3.~~6~~.3 are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in Reference 3. The actual nominal trip setpoint is normally still more conservative than that required by the plant specific setpoint calculations. If the measured setpoint does not exceed the documented surveillance trip acceptance criteria, the undervoltage relay is considered OPERABLE. 5

Setpoints in accordance with the Allowable Values will ensure that the consequences of accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the accident and the equipment functions as designed.

~~The undervoltage protection scheme has been designed to protect the plant from spurious trips caused by the offsite power source. This is made possible by the inverse voltage time characteristics of the relays used.~~ A complete loss of offsite power will result in approximately a 1 second delay in LOVS actuation. The DG starts and is available to 1

1

INSERT 1

The 4.16 kV LOVS Functions include Loss of Voltage and Degraded Voltage Functions. The allowable values are provided in SR 3.3.5.3.

Each Class 1E 4.16 kV Bus utilizes two solid-state undervoltage relays, in a 2-out-of-2 coincident logic, for loss of voltage detection. The function of these relays is to initiate source disconnection, load shedding, diesel generator starting, and load sequencing on the effected train (bus). The LOVS initiated actions are described in Reference 1.

Each Class 1E 4.16 kV Bus utilizes three solid state undervoltage relays in a 2-out-of-3 coincident logic for degraded voltage detection. The function of these relays is the same as described for the loss of voltage detection.

Each Class 1E 480V Bus utilizes three solid state undervoltage relays in a 2-out-of-3 coincident logic scheme, for loss of voltage detection.

Each Class 1E 480V Bus utilizes three solid state undervoltage relays in a 2-out-of-3 coincident logic scheme, for degraded voltage detection.

BASES

BACKGROUND (continued)

accept loads within a 10 second time interval on the Engineered Safety Features Actuation System (ESFAS) or LOVS. Emergency power is established within the maximum time delay assumed for each event analyzed in the accident analysis (Ref. 2).

INSERT 2

~~Since there are four protective channels in a two-out-of-four trip logic for each division of the 4.16 kV power supply, no single failure will cause or prevent protective system actuation. This arrangement meets IEEE Standard 279-1971 criteria (Ref. 4).~~ 1

APPLICABLE SAFETY ANALYSES

The DG - LOVS is required for Engineered Safety Features (ESF) systems to function in any accident with a loss of offsite power. Its design basis is that of the ESFAS.

Accident analyses credit the loading of the DG based on a loss of offsite power during a loss of coolant accident. The actual DG start has historically been associated with the ESFAS actuation. The diesel loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. ~~The analysis assumes a nonmechanistic DG loading, which does not explicitly account for each individual component of the loss of power detection and subsequent actions.~~ This delay time includes contributions from the DG start, DG loading, and Safety Injection System component actuation. The response of the DG to a loss of power must be demonstrated to fall within this analysis response time when including the contributions of all portions of the delay. 1

The required channels of LOVS, in conjunction with the ESF systems powered from the DGs, provide plant protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed. LOVS channels are required to meet the redundancy and testability requirements of GDC 21 in 10 CFR 50, Appendix A (Ref. ~~5~~ 6).

The delay times assumed in the safety analysis for the ESF equipment include the ~~[~~10~~]~~ second DG start delay and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment include the appropriate DG loading and sequencing delay.

The DG - LOVS channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO for the LOVS requires that ~~four channels per bus of each LOVS instrumentation Function~~ two channels per DG of the 4.16 kV Loss of Voltage Function; and three channels per DG of the 4.16 kV Degraded Voltage, 480 V Loss of Voltage, and 480 V Degraded Voltage Functions be OPERABLE in MODES 1, 2, 3, and 4 and when the associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown." The LOVS supports safety systems associated 1

1

INSERT 2

The Class 1E 4.16 kV system and Class 1E 480 V system are designed to meet the single failure criteria as defined in IEEE 308 (Ref. 4) and IEEE 279 (Ref. 5). Specifically, any credible single failure shall not prevent the satisfactory performance of the minimum Class 1E 4.16kV loads or Class 1E 480 V loads required to achieve and maintain safe shutdown or to monitor or mitigate the consequences of any design basis accident or event. The worst case single failure will disable only one train of the Class 1E 4160V or Class 1E 480 V system.

BASES

LCO (continued)

two channels per DG of the 4.16 kV Loss of Voltage Function; and three channels per DG of the 4.16 kV Degraded Voltage, 480 V Loss of Voltage, and 480 V Degraded Voltage Functions

with the ESFAS. In MODES 5 and 6, the ~~four channels~~ must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed.

~~Actions allow maintenance (trip channel) bypass of individual channels. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At plants where adequate channel to channel independence has been demonstrated, specific exceptions have been approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~ 1

~~Loss of LOVS Function could result in the delay of safety system initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an anticipated operational occurrence, the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump as well as an increased potential for a loss of decay heat removal through the secondary system.~~ 1

Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the plant specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable, provided that operation and testing are consistent with the assumptions of the plant specific setpoint calculation. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

~~[For this unit, the Bases for the Allowable Values and trip setpoints are as follows:]~~ 1

APPLICABILITY

The DG - LOVS actuation Function is required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE, so that it can perform its function on a loss of power or degraded power to the vital bus.

ACTIONS

A LOVS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint

BASES

ACTIONS (continued)

analysis. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. Determination of setpoint drift is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the instrument is set up for adjustment to bring it within specification. If the actual trip setpoint is not within the Allowable Value, the channel is inoperable and the appropriate Conditions must be entered.

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition entered. The required channels are specified on a per DG basis.

~~When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be entered immediately if applicable in the current MODE of operation.~~ 1

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this LCO may be entered independently for each Function. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function.

A.1~~, A.2.1, and A.2.2~~ 1

Condition A applies if one 4.16 kV Loss of Voltage Function channel per DG is inoperable. ~~channel is inoperable for one or more Functions per DG bus~~.

If the channel cannot be restored to OPERABLE status within 48 hours, the affected channel should ~~either~~ be ~~bypassed or~~ tripped within ~~1~~ 48 hours (Required Action A.1). 1

Placing ~~this~~ the channel in ~~either~~ this Condition ensures that logic is in a known configuration. In trip, the LOVS Logic is one-out-of-~~three~~ one. ~~In bypass, the LOVS Logic is two-out-of-three.~~ The ~~1~~ 48 hour Completion Time is sufficient to perform the~~se~~ Required Action~~s~~. 1

INSERT 3

~~Once Required Action A.1 has been complied with, Required Action A.2.1 allows [48] hours to repair the inoperable channel for those plants that have not demonstrated sufficient channel to channel independence on this Function. [Alternatively, a Completion Time can be determined in~~ 1

1

INSERT 3

The Required Actions are modified by a Note that allows one channel to be bypassed for up to 2 hours for surveillance testing. This allowance is based on the average time required to perform the channel surveillance.

3

BASES

ACTIONS (continued)

~~accordance with the Risk Informed Completion Time Program.] If the channel cannot be restored to OPERABLE status, it must be tripped in accordance with Required Action A.2.2.~~ The time allowed to repair or trip the channel is reasonable to repair the affected channel while ensuring that the risk involved in operating with the inoperable channel is acceptable. The ~~[~~48~~]~~ hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel is a rare event during any given ~~[~~48~~]~~ hour period. ~~[Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

INSERT 4

C ~~B~~.1~~, B.2.1, and B.2.2~~ 3

Condition C ~~B~~ applies if two channels or more are inoperable for one or more Functions per DG.

If the channel cannot be restored to OPERABLE status within 1 hour, Condition D is entered and the affected DG is declared inoperable. ~~the Conditions and Required Actions for the associated DG made inoperable by DG - LOVS instrumentation are required to be entered. Alternatively, one affected channel is required to be bypassed and the other is tripped, in accordance with Required Action B.2.1. This places the Function in one-out-of-two logic.~~ The 1 hour Completion Time is sufficient to perform the Required Actions. 1 1

~~Once Required Action B.2.1 has been complied with, Required Action B.2.2 allows [48] hours to repair the bypassed or inoperable channel. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

After one channel is restored to OPERABLE status, the provisions of Condition A or Condition B still apply to the remaining inoperable channel. ~~Therefore, the channel that is still inoperable after completion of Required Action B.2.2 shall be placed in trip if more than [48] hours have elapsed since the initial channel failure. [Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.]~~ 1

~~C.1~~

~~Condition C applies when more than two undervoltage or Degraded Voltage channels on a single bus are inoperable.~~ 1

1

INSERT 4

B.1 and B.2

Table 3.3-3
Action 17B

Condition B applies if one or more Functions with one channel per DG inoperable (except 4.16 kV Loss of Voltage Function). The applicable Functions are the 4.16 kV Degraded Voltage Function, 480 V Loss of Voltage Function, and 480 V Degraded Voltage Function.

If the channel cannot be restored to OPERABLE status within 48 hours or in accordance with the Risk Informed Completion Time (Required Action B.1), the affected channel is placed in trip (Required Action B.2). Placing the channel in this Condition ensures that logic is in a known configuration. In trip, the LOVS Logic is one-out-of-two. The 48 hour Completion Time is sufficient to perform these Required Actions.

The time allowed to repair or trip the channel is reasonable to repair the affected channel while ensuring that the risk involved in operating with the inoperable channel is acceptable. The 48 hour Completion Time is based upon operating experience, which has demonstrated that a random failure of a second channel is a rare event during any given 48 hour period. Alternatively, a Completion Time can be determined in accordance with the Risk Informed Completion Time Program.

The Required Actions are modified by a Note that allows one channel to be bypassed for up to 2 hours for surveillance testing. This allowance is based on the average time required to perform the channel surveillance.

BASES

ACTIONS (continued)

~~Required Action C.1 requires all but two channels to be restored to OPERABLE status within 1 hour [or in accordance with the Risk Informed Completion Time Program]. With more than two channels inoperable, the logic is not capable of providing a DG - LOVS signal for valid Loss of Voltage or Degraded Voltage conditions. The 1 hour Completion Time is reasonable to evaluate and take action to correct the degraded condition in an orderly manner and takes into account the low probability of an event requiring LOVS occurring during this interval.~~ 1

D.1 3

Condition D applies if the Required Actions and associated Completion Times are not met. 3

Required Action D.1 ~~ensures that~~ requires declaring ~~Required Actions for~~ the affected DG inoperab~~ilitie~~le~~s are initiated~~. Depending upon plant MODE, the actions specified in LCO 3.8.1, "AC Sources - Operating," or LCO 3.8.2, "AC Sources - Shutdown", are required immediately. 3 1 1

SURVEILLANCE REQUIREMENTS

The following SRs apply to each DG - LOVS Function.

~~[~~ SR 3.3.~~6~~5.1 2 3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated output of the potential transformers that feed the LOVS undervoltage relays. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two channels could be an indication of excessive drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. ~~]~~ 2

~~[The Frequency, about once every shift, is based upon operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The~~ 2

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE----- Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. -----]~~ 2

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SR 3.3.~~6~~.2 3

A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel will perform its intended function when needed. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any [92] day Frequency is a rare event. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE----- Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. -----]~~ 2

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. ~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~ 1

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SR 3.3.~~6~~.3 3

5

SR 3.3.~~6~~.3 is the performance of a CHANNEL CALIBRATION. The CHANNEL CALIBRATION verifies the accuracy of each component within the instrument channel. This includes calibration of the undervoltage relays and demonstrates that the equipment falls within the specified operating characteristics defined by the manufacturer.

The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. The~~re is a plant specific program which~~ Surveillance verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The setpoints, as well as the response to a Loss of Voltage and Degraded Voltage test, shall include a single point verification that the trip occurs within the required delay time as shown in Reference 1. ~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

3

BASES

REFERENCES

1. FSAR, Section ~~[~~8.3~~]~~. U 1 2

2. FSAR, Chapter ~~[~~15~~]~~. U 1 2

3. ~~"Plant Protection System Selection of Trip Setpoint Values."~~ IC-3.17, FPL Setpoint Standard.

4. IEEE Standard 308-1971.

~~4~~ 5. IEEE Standard 279-1971.

~~5~~ 6. 10 CFR 50, Appendix A, GDC 21.

3 1

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5 BASES, DIESEL GENERATOR (DG) – LOSS OF VOLTAGE START (LOVS)

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. The heading for ISTS 3.3.6 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2). Therefore, ISTS 3.3.2 is not included in the PSL ITS. The successive Specifications are renumbered as necessary.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.5, DIESEL GENERATOR (DG) – LOSS OF VOLTAGE START (LOVS)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 6

3.3.6, Containment Isolation Instrumentation – Refueling

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

CONTAINMENT ISOLATION

3/4.3.3 ~~MONITORING~~ INSTRUMENTATION – REFUELING

~~RADIATION MONITORING~~

A02

LIMITING CONDITION FOR OPERATION

and one automatic actuation logic train

Three containment

LCO 3.3.6 3.3.1 ~~The~~ radiation monitor~~ing instrumentation~~ channels ~~shown in Table 3.3-6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY:** ~~As shown in Table 3.3-6.~~ During movement of recently irradiated fuel assemblies within containment.

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

M01

A02

required

Condition A b With one or more radiation monitor~~ing~~ channels inoperable, ~~take the ACTION shown in Table 3.3-6.~~

one required automatic actuation logic train inoperable or

~~c. The provisions of Specification 3.0.3 are not applicable.~~

A03

SURVEILLANCE REQUIREMENTS

required containment

SR 3.3.6.1
SR 3.3.6.2
SR 3.3.6.4

4.3.3.1 Each radiation monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program. Add proposed SR 3.3.6.3

A02

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

Allowable Value

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABLE MODES~~	~~ALARM/TRIP SETPOINT~~	~~MEASUREMENT RANGE~~	ACTION	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area	1	*	≤ 15 mR/hr	$10^{-1} – 10^{4}$ mR/hr	13	See ITS 3.3.8
LCO 3.3.6 SR 3.3.6.2 b. Containment ~~(CIS)~~ Radiation Monitor	3	****	≤ 90 mR/hr	~~$1 – 10^{5}$ mR/hr~~	~~16~~ A	LA01
c. Containment Area – Hi Range	1	1, 2, 3, & 4	≤ 10 R/hr	$1 – 10^{7}$ R/hr	15	See ITS 3.3.9
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	$10 - 10^{7}$ cpm	17	See ITS 3.3.7
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 – 10^{6}$ cpm	14	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 – 10^{6}$ cpm	14	

Add Automatic Actuation Logic Function

M02

* With fuel in the storage pool or building. See ITS 3.3.8

Applicability **** During movement of recently irradiated fuel assemblies within containment.

~~TABLE 3.3-6 (Continued)~~

~~TABLE NOTATION~~

ACTION 12 - DELETED

ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 14 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 15 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s),and

2) Prepare and submit a Special Report to the Commission pursuant to Specification6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

ACTION A ~~ACTION 16 -~~ With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, ~~comply with the ACTION requirements of Specification 3.9.9~~. Add proposed ACTION A

A04

ACTION 17 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

INSTRUMENTATION

3/4.3.3 CONTAINMENT ISOLATION ~~MONITORING~~ INSTRUMENTATION – REFUELING

~~RADIATION MONITORING INSTRUMENTATION~~

A02

LIMITING CONDITION FOR OPERATION

LCO 3.3.6 3.3.3.1 Three containment ~~The~~ radiation monitor~~ing instrumentation~~ channels and one automatic actuation logic train ~~shown in Table 3.3-6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-6.~~ During movement of recently irradiated fuel assemblies within containment.

ACTION:

~~a.~~ ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ M01

Condition A b. With one required automatic actuation logic train inoperable or one or more required radiation monitor~~ing~~ channels inoperable, take the ~~ACTION shown in Table 3.3-6~~. A02

~~c.~~ ~~The provisions of Specification 3.0.3 are not applicable.~~ A03

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1
SR 3.3.6.2
SR 3.3.6.4 4.3.3.1 Each required containment radiation monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK~~,~~ CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program. Add proposed SR 3.3.6.3 A02

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

Allowable Value

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABLE MODES~~	~~ALARM/TRIP SETPOINT~~	~~MEASUREMENT RANGE~~	ACTION	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area						See ITS 3.3.8
i. Criticality and Ventilation System Isolation Monitor	4	*	≤ 20 mR/hr	$10^{-1} - 10^{4}$ mR/hr	22	
LCO 3.3.6 SR 3.3.6.2 b. Containment ~~Isolation~~ Radiation Monitor	3	****	≤ 90 mR/hr ~~10~~	~~$1 - 10^{7}$ mR/hr~~	~~25~~ A	LA01
c. Containment Area – Hi Range	1	1, 2, 3 & 4	Not Applicable	$1 - 10^{7}$ R/hr	27	See ITS 3.3.9
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	$10^{-7} - 10^{-2}$ µCi/cc	26	See ITS 3.3.7
2. PROCESS MONITORS						M02
a. Containment						See ITS 3.4.15
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10^{-7} - 10^{-2}$ µCi/cc	23	
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 - 10^{7}$ cpm	23	

Add Automatic Actuation Logic Function

* With fuel in the storage pool or building. See ITS 3.3.8

Applicability **** During movement of recently irradiated fuel assemblies within containment.

~~TABLE 3.3-6 (Continued)~~

~~ACTION STATEMENTS~~

ACTION 22 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

~~ACTION 24 - DELETED~~

ACTION A

ACTION 25 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, ~~comply with the ACTION requirements of Specification 3.9.9~~. Add proposed ACTION A

A04

ACTION 26 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

ACTION 27 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s), and

2) Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.3.3.1 specifies requirements for radiation monitoring instrumentation and list the requirements for each functional unit in CTS Table 3.3-6, including the containment radiation monitoring instrumentation. ITS 3.3.6 provides requirements for the containment isolation instrumentation - refueling instrumentation and provides the requirements in the LCO, Applicability, ACTIONS, and Surveillance Requirements. This changes the CTS by presenting the instrument requirements without use of an instrument table. This change is acceptable as it results solely from the change in the format and presentation of the CTS necessary to conform to the ISTS. As the proposed change is the result of changes in the format and presentation of the CTS requirements, it is designated administrative.

A03 CTS 3.3.3.1 Action c states that the provisions of Specification 3.0.3 are not applicable. CTS 3.0.3 (ITS LCO 3.0.3) does not apply in MODES 5 and 6, which encompasses the condition of during movement of recently irradiated fuel assemblies within the containment. This changes the CTS by eliminating an action requirement that is redundant to other Technical Specification requirements.

The purpose of CTS 3.3.3.1 Action c is to preclude action be taken per Specification 3.0.3 (ITS LCO 3.0.3) to shutdown the unit in the event there are no actions to perform or the actions cannot be performed within the required time when the containment radiation monitoring instrumentation is inoperable. CTS 3.0.3 (ITS LCO 3.0.3) is not applicable while in MODE 5 or 6. Recently irradiated fuel is defined as fuel that has occupied part of a critical reactor core within the previous 72 hours. To access the fuel to begin movement of recently irradiated fuel requires the unit to be in MODE 6. Therefore, the only time recently irradiated fuel can possibly be moved in the containment is following entry into MODE 6 and only up to 72 hours after reaching subcritical conditions. Since LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4, stating that the provisions of Specification 3.0.3 are not applicable is redundant and unnecessary. This change is designated as administrative and is acceptable because it does not result in a technical change to the CTS.

A04 CTS 3.3.3.1 Action b requires, when one or more radiation monitoring channels are inoperable, to take the Action shown in Table 3.3-6. Thus, when the minimum number of required containment radiation monitor channels are inoperable CTS Table 3.3-6, Action 16 (Unit 1) and Action 25 (Unit 2) require compliance with the Action requirements of Specification 3.9.9. ITS 3.3.6

provides explicit actions consistent with the actions of Specification 3.9.9; place and maintain containment purge and exhaust valves in the closed position or suspend movement of recently irradiated fuel assemblies within the containment (per the action of Specification 3.9.3, "Containment Penetrations."). This changes the action presentation of the CTS.

The purpose of the CTS action is to ensure the actions of the supported system, containment isolation valves, are performed consistent with the containment isolation system action requirements specified in CTS 3.9.9. CTS 3.9.9 action requires either suspending all operations involving movement of recently irradiated fuel assemblies within containment or close each of the containment penetrations providing direct access from the containment atmosphere to the outside atmosphere. ITS 3.3.6 Required Action A.1 requires immediately placing and maintaining at least one containment isolation valve in each penetration providing direct access from the containment atmosphere to outside atmosphere in the closed position. ITS 3.3.6 Required Action A.2 requires entering applicable ACTIONS for the affected valves of LCO 3.9.3, "Containment Penetrations," made inoperable by the isolation instrumentation. The applicable ACTIONS in Specification 3.9.3 require immediate suspension of movement of recently irradiated fuel assemblies within containment. This change is designated as administrative and is acceptable because it results in changes in the format and presentation of the CTS requirements.

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. Upon declaring a required channel inoperable, CTS Table 3.3-6, Action 16 (Unit 1) and Action 25 (Unit 2) require compliance with the Action requirements of Specification 3.9.9. ITS 3.3.6 requires the required channels to be declared inoperable immediately when the actuation setting exceeds the setpoint specified in SR 3.3.6.2 and associated actions must be performed. This changes the CTS by deleting the 4 hour allowance to declare a channel inoperable and requiring the channel to be declared inoperable immediately upon discovery that the channel is outside the required setpoint value.

The purpose of CTS 3.3.3.1 Action a is to provide a short time period to restore an inoperable channel prior to requiring additional action. CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. When LCO 3.3.6 is not met (e.g., SR 3.3.6.2 not met), LCO 3.0.2 requires the associated ACTIONS to be entered with no delay. Each radiation channel provides input to the associated containment high radiation instrument train which actuates the associated containment isolation valves. Therefore, the ITS action is considered appropriate. This change is designated as more restrictive because the Completion Time to declare the instrument channel inoperable following discovery of the channel exceeding it associated trip setpoint has been reduced.

M02 CTS 3.3.3.1 specifies requirements for radiation monitoring instrumentation and list the requirements for each functional unit in CTS Table 3.3-6, including the containment radiation monitoring instrument channels. ITS 3.3.6 also includes requirements for the containment radiation monitoring instrument channels but also includes requirements for one automatic actuation logic train. LCO 3.3.6 requires, in part, one automatic Actuation Logic train to be OPERABLE and SR 3.3.6.3 requires performance of a CHANNEL FUNCTIONAL TEST on the required Actuation Logic train with a note specifying that testing of the Actuation Logic shall include verification of the proper operation of each initiation relay. The SR Frequency is proposed to be in accordance with the Surveillance Frequency Control Program (SFCP). The proposed actions for the automatic Actuation Logic train are the same as for the containment radiation monitor channels. This changes the CTS by adding requirements in the ITS associated with one train of containment isolation instrument logic.

The purpose of the containment radiation monitoring instrumentation requirements is to ensure isolation capability is maintained to penetrations providing direct access from the containment atmosphere to the outside atmosphere during movement of recently irradiated fuel assemblies within the containment. At least one automatic actuation logic train is required to ensure the applicable containment isolation valves receive an isolation signal from the containment radiation monitoring instrument channels. Therefore, these requirements are appropriate and necessary to ensure the containment radiation monitoring instrumentation can perform its intended safety function. This change is consistent with ISTS 3.3.7.

PSL controls periodic Frequencies for Surveillances in accordance with the SFCP per CTS 6.8.4.o (Unit 1) and CTS 6.8.4.q (Unit 2). Therefore, the initial periodic Frequency for ITS SR 3.3.6.3 in accordance with the SFCP will be 31 days consistent with the CHANNEL FUNCTIONAL TEST testing frequency for ISTS SR 3.3.7.3. The periodic Frequency is acceptable based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of one automatic actuation logic channel in any 31 day interval is a rare event.

The SFCP was established as described in FPL (PSL Unit 1 and Unit 2) "Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program" (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066)

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 - Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6 for radiation monitoring instrumentation has a column specifying the Measurement Range and a specific measurement range for the containment radiation instrumentation. ITS 3.3.6 does not retain the "MEASUREMENT RANGE" column or the specific measurement range of the containment radiation monitor channels. This changes the CTS by moving the instrument measurement range to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. The low end of the measurement range for the Unit 2 containment radiation monitoring instrumentation is changed from 1 mR/hr to 10 mR/hr to be consistent with the current radiation monitor instrument measurement range. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

None

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~ 3

3.3.~~7~~ 6 Containment ~~Purge~~ Isolation ~~Signal (CPIS) (Analog)~~ Instrumentation – Refueling 3 1

3.3.3.1 LCO 3.3.~~7~~ 6 ~~[Four] CPIS~~ Three containment radiation monitor channels and one ~~CPIS~~ automatic Actuation Logic ~~and one Manual Trip~~ train shall be OPERABLE. 3 2 1

Applicability APPLICABILITY: During movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One radiation monitor channel inoperable.~~	~~A.1 Place the affected channel in trip.~~ ~~OR~~ ~~A.2 Suspend movement of [recently] irradiated fuel assemblies within containment.~~	~~4 hours~~ 1 ~~Immediately~~ 1
Action b. Table 3.3-6 Function 1.b ~~B~~A. One required ~~Manual Trip or~~ automatic Actuation Logic train inoperable. OR ~~More than one~~ One or more required radiation monitor channels inoperable. ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	~~B~~A.1 Place and maintain ~~containment purge and exhaust valves~~ at least one containment isolation valve in each penetration providing direct access from containment atmosphere to outside atmosphere in closed position. OR ~~B~~A.2 Enter applicable Conditions and Required Actions for affected valves of LCO 3.9.3, "Containment Penetrations," made inoperable by isolation instrumentation.	Immediately 3 1 1 Immediately 1 3 1

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
4.3.3.1	SR 3.3.~~7~~.1 (6)	Perform a CHANNEL CHECK on each required containment radiation monitor channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	(3) (2) (1) (2)
4.3.3.1 Table 3.3-6 Function 1.b	SR 3.3.~~7~~.2 (6)	Perform a CHANNEL FUNCTIONAL TEST on each required containment radiation monitor channel. Verify ~~CPIS~~ containment high radiation setpoint is less than or equal to the Allowable Value of ~~[220~~ 90 mR/hr~~]~~.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	(3) (2) (1) (2)
4.3.3.1	SR 3.3.~~7~~.3 (6)	------------------------------NOTE------------------------------ Testing of Actuation Logic shall include verification of the proper operation of each initiation relay. -- Perform a CHANNEL FUNCTIONAL TEST on ~~each~~ required ~~CPIS~~ Actuation Logic ~~channel~~ train.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	(3) (1) (2) (1) (2)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
4.3.3.1 SR 3.3.~~7~~.4 6	Perform a CHANNEL CALIBRATION on each required containment radiation monitor channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
~~SR 3.3.7.5~~	~~Perform a CHANNEL FUNCTIONAL TEST on each CPIS Manual Trip channel.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	2 2
~~SR 3.3.7.6~~	~~Verify CPIS response time of each containment radiation channel is within limits.~~	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	2 2

3.3 INSTRUMENTATION ~~(Analog)~~ 3

3.3.~~7~~ 6 Containment ~~Purge~~ Isolation ~~Signal (CPIS) (Analog)~~ Instrumentation – Refueling 3 1

3.3.3.1 LCO 3.3.~~7~~ 6 ~~[Four] CPIS~~ Three containment radiation monitor channels and one ~~CPIS~~ automatic Actuation Logic ~~and one Manual Trip~~ train shall be OPERABLE. 3 2 1

Applicability APPLICABILITY: During movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One radiation monitor channel inoperable.~~	~~A.1 Place the affected channel in trip.~~ ~~OR~~ ~~A.2 Suspend movement of [recently] irradiated fuel assemblies within containment.~~	~~4 hours~~ 1 ~~Immediately~~ 1
Action b. Table 3.3-6 Function 1.b 4.3.3.1 ~~B~~ A. One required ~~Manual Trip or~~ automatic Actuation Logic train inoperable. OR ~~More than one~~ One or more required radiation monitor channel s inoperable. ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	~~B~~ A.1 Place and maintain ~~containment purge and exhaust valves~~ at least one containment isolation valve in each penetration providing direct access from containment atmosphere to outside atmosphere in closed position. OR ~~B~~ A.2 Enter applicable Conditions and Required Actions for affected valves of LCO 3.9.3, "Containment Penetrations," made inoperable by isolation instrumentation.	Immediately 3 1 1 Immediately 1 3 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.3.3.1	SR 3.3.~~7~~6.1	Perform a CHANNEL CHECK on each required containment radiation monitor channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
4.3.3.1 Table 3.3-6 Function 1.b	SR 3.3.~~7~~6.2	Perform a CHANNEL FUNCTIONAL TEST on each required containment radiation monitor channel. Verify ~~CPIS~~ containment high radiation setpoint is less than or equal to the Allowable Value of ~~[220~~ 90 mR/hr~~]~~.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
4.3.3.1	SR 3.3.~~7~~6.3	-------------------------------NOTE------------------------------ Testing of Actuation Logic shall include verification of the proper operation of each initiation relay. --- Perform a CHANNEL FUNCTIONAL TEST on ~~each~~ required ~~CPIS~~ Actuation Logic ~~channel~~ train.	 ~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 1 2 1 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
4.3.3.1 SR 3.3.~~7~~.4 6	Perform a required CHANNEL CALIBRATION on each containment radiation monitor channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
~~SR 3.3.7.5~~	~~Perform a CHANNEL FUNCTIONAL TEST on each CPIS Manual Trip channel.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	2 2
~~SR 3.3.7.6~~	~~Verify CPIS response time of each containment radiation channel is within limits.~~	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	2 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, CONTAINMENT ISOLATION INSTRUMENTATION – REFUELING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.7 to 3.3.6, title is changed to “Containment Isolation Instrumentation – Refueling” and “(Analog)” is deleted from the title.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

3

B 3.3.~~7~~ Containment ~~Purge~~ Isolation ~~Signal (CPIS) (Analog)~~

Instrumentation – Refueling

6

3 1

BASES

BACKGROUND

This LCO encompasses ~~CPIS actuation, which is a plant specific instrumentation system that performs an actuation Function required for plant protection but is not otherwise included in LCO 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCOs 3.3.5 and 3.3.6. Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements applicable to them.~~

Insert 1

containment high radiation instrumentation

The ~~CPIS~~ provides protection from radioactive contamination in the containment in the event a~~n~~ irradiated fuel assembly should be severely damaged during handling.

recently

containment isolation

applicable containment isolation valves close to isolate the containment atmosphere from the outside atmosphere

The ~~CPIS~~ will detect any abnormal amounts of radioactive material in the containment and will initiate ~~purge~~ valve closure to limit the release of radioactivity to the environment. The ~~containment purge supply and exhaust valves are closed on a CPIS~~ when a high radiation level in containment is detected.

CIS logic

logic channels

Insert 2

The ~~CPIS~~ includes two independent, redundant actuation ~~subsystems~~. ~~Where two isolation control valves are provided for a single containment penetration, each valve is controlled by a separate actuation subsystem. Where one valve is available, a single actuation subsystem initiates valve closure. One train also isolates the containment air exhaust fan, whereas the other train actuates the containment air supply fan.~~ A list of actuated valves and an additional description of the ~~CPIS~~ are included in Reference 1. Both trains of ~~CPIS~~ are actuated on a two-out-of-four coincidence from the same four containment radiation sensor ~~subsystems~~. ~~Containment purge isolation also occurs on a Containment Isolation Actuation Signal (CIAS). The CIAS is addressed by~~ LCO 3.3.4, "Engineered Safety Features Actuation System (ESFAS) ~~Instrumentation~~."

CIS

s

Insert 3

Logic and Manual Trip

1

Trip Setpoints and Allowable Values

~~Trip setpoints used in the bistables are based on the analytical limits stated in Reference 2.~~ The selection of ~~these~~ trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Value~~s~~

the

1 **INSERT 1**

containment radiation instrumentation which monitors radiation levels in the containment to automatically close at least one containment isolation valve in each penetration that provides direct access from the containment atmosphere to the outside atmosphere following a fuel handling accident (FHA). The containment isolation requirements during refueling are specified in LCO 3.9.3, "Containment Penetrations."

1 **INSERT 2**

Four channels of containment high radiation instrumentation, with a sensing range of 1 mR/hr to 100 R/hr, are provided to the containment isolation signal (CIS) logic.

1 **INSERT 3**

Each containment isolation valve is actuated by its associated CIS channel. The instrumentation requirements associated with containment isolation actuation while the unit is operating are addressed in LCO 3.3.3, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," and

BASES

BACKGROUND (continued)

6 is

specified in SR 3.3.~~7~~.2 ~~are~~ conservatively adjusted with respect to the design basis ~~analytical~~ limit~~s~~. ~~A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in "Plant Protection System Selection of Trip Setpoint Values" (Ref. 3).~~ The actual nominal trip setpoint entered into the bistable is normally ~~still~~ more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.

~~Setpoints in accordance with the Allowable Value will ensure that Safety Limits are not violated during anticipated operational occurrences (AOOs) and the consequences of Design Basis Accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.~~

Insert 4

APPLICABLE SAFETY ANALYSES

The ~~CPIS~~ containment high radiation instrumentation satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Only the Allowable Value~~s are~~ is specified for ~~each~~ the trip Function in the LCO. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable, provided that the difference between the nominal trip setpoint and the Allowable Value is equal to or greater than the drift allowance ~~assumed for each trip in the transient and accident analyses~~.

The ~~Each~~ Allowable Value specified is more conservative than the design basis ~~analytical~~ limit ~~assumed in the transient and accident analysis~~ in order to account for instrument uncertainties appropriate to the trip Function. ~~These uncertainties are defined in Reference 3.~~ A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

The Bases for the LCO on the ~~CPIS~~ containment high radiation instrumentation are discussed below for each Function:

~~a. Manual Trip~~

~~The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CPIS Function if any parameter is trending toward its setpoint. At least one channel must be OPERABLE to be consistent with the requirements of LCO 3.9.3, "Containment Penetrations."~~

1

1

INSERT 4

The FHA is a postulated event that involves dropping a single irradiated fuel assembly resulting in damage to the assembly (Ref. 2). The FHA analysis assumes movement of an irradiated fuel assembly that has not occupied part of a critical reactor core within the previous 72 hours. Additionally, containment closure is not assumed for an FHA in the containment. The Technical Requirements Manual includes a decay time requirement that no fuel movement will commence until 72 hours after shutdown. This ensures that the FHA assumptions, including an open containment, are preserved. In the event an FHA in the containment occurs within 72 hours of a unit shutdown, actuation of the CIS when high radiation is indicated in the containment will isolate the containment from the outside environment to minimize the consequences of this improbable event.

BASES

LCO (continued)

~~b~~ a. Containment Radiation - High

Insert 5 ~~The LCO on the radiation channels requires that all four be OPERABLE.~~

~~[For this unit, the basis for the Containment Radiation - High setpoint is as follows:]~~

~~c~~ b. Actuation Logic

Insert 6 ~~One train of Actuation Logic must be OPERABLE to be consistent with the requirements of LCO 3.9.3. If one fails, it must be restored to OPERABLE status.~~

2

APPLICABILITY

In MODE 5 or 6, the ~~CPIS isolation of containment purge valves~~ containment high radiation instrumentation is not required to be OPERABLE. However, during movement of ~~[~~recently~~]~~ irradiated fuel ~~[~~(i.e., fuel that has occupied part of a critical reactor core within the previous ~~[X] days)]~~ 72 hours), there is the possibility of ~~a fuel handling accident~~ an FHA requiring the ~~CPIS~~ isolation of penetrations providing direct access from the containment atmosphere to the outside atmosphere on high radiation in containment. Accordingly, the ~~CPIS~~ containment high radiation instrumentation must be OPERABLE during movement of ~~[~~recently~~]~~ irradiated fuel in containment.

2 2 1

Insert 7 In MODES 1, 2, 3, and 4, ~~the containment purge valves are sealed closed~~.

ACTIONS

A ~~CPIS~~ containment high radiation monitor channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the actual trip setpoint is not within the Allowable Value in SR 3.3.~~7~~6.2, the channel is inoperable and the appropriate Conditions must be entered.

~~In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel should be declared inoperable and the LCO Condition entered for the particular protective function affected.~~

1

INSERT 5

With one Containment Radiation – High channel inoperable, three OPERABLE channels remain available to actuate the CIS logic train concurrent with an additional single failure. Therefore, the LCO requires three of four channels to be OPERABLE.

During refueling conditions, closure of containment isolation valves associated with containment penetrations with direct access from the containment atmosphere to the outside atmosphere on high containment radiation is particularly important since other CIS input parameters are not available (i.e., low pressurizer pressure is bypassed and there is no mechanism for creating a containment pressure transient). With the reactor shutdown, the background radiation seen by the CIS detectors drops by a factor of 10 or more. For these reasons the Containment Radiation - High setpoint requires a much lower setpoint during refueling.

1

INSERT 6

Since LCO 3.9.3 requires, in part, an OPERABLE containment isolation valve for each penetration providing direct access from the containment atmosphere to the outside atmosphere, only one train of Actuation Logic associated with the required containment isolation valves is required to be OPERABLE.

1

INSERT 7

When movement of irradiated fuel assemblies within containment is not being conducted, the potential for an FHA within the containment does not exist. Therefore, due to radioactive decay, an FHA that involves handling non-recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core longer than 72 hours) will result in doses that are well within the guideline values specified in 10 CFR 50.67 even with the containment atmosphere having direct access to the outside atmosphere. Therefore, under these conditions, isolation of the containment penetrations providing direct access to the outside environment, including the associated containment area high radiation instrumentation, is not required to be OPERABLE.

In MODES 1, 2, 3, and 4, LCO 3.3.3 provide instrumentation requirements associated with containment isolation on high containment radiation.

BASES

ACTIONS (continued)

~~When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.~~

~~A.1 and A.2~~

~~Condition A applies to the failure of one Containment Radiation - High CPIS channel. The Required Action is to place the affected channel in the trip condition within 4 hours. The Completion Time accounts for the fact that three redundant channels monitoring containment radiation are still available to provide a single trip input to the CPIS logic to provide the automatic mitigation of a radiation release. Alternately, action must be taken to place the unit in a condition where the LCO does not apply. This does not preclude the movement of fuel to a safe position.~~

~~B~~A.1 and ~~B~~A.2

Condition ~~B~~ A applies to the failure of the required ~~Manual Trip or~~ automatic Actuation Logic train, or to the failure of ~~more than~~ one or more required radiation monitoring channels ~~or if the Required Action and associated Completion Time of Condition A are not met~~. Required Action ~~B~~ A.1 is to place ~~the containment purge and exhaust isolation valves~~ at least one containment isolation valve in each penetration providing direct access from containment atmosphere to outside atmosphere in the closed position. The Required Action immediately performs the isolation Function of the ~~CPIS~~ CIS. Required Action ~~B~~ A.2 is to immediately enter the applicable Conditions and Required Actions for the affected isolation valves of LCO 3.9.3, "Containment Penetrations," that were made inoperable by the inoperable instrumentation ~~of the CPIS LCO~~. The Required Action directs the operator to take actions that are appropriate for the containment isolation Function ~~of the CPIS without initiating the containment air supply and exhaust fans~~. The Completion Time accounts for the fact that the automatic capability to isolate containment ~~and initiate supply and exhaust fans~~ on a valid containment high radiation signal~~s~~ is degraded during conditions in which a fuel handling accident is possible ~~and CPIS provides the only automatic mitigation of radiation release~~.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.~~7~~.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 transmitter or the signal processing equipment has drifted outside its limits.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~-----]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.~~7~~ 6.2

A CHANNEL FUNCTIONAL TEST is performed on each containment radiation monitoring channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any [92] day interval is a rare event.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~

SR 3.3.~~7~~ 6.3

Proper operation of the initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic. This will actuate the Function, operating ~~all~~ the associated equipment. Proper operation of the equipment actuated by ~~each~~ the train is thus verified. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ A Note indicates this Surveillance includes verification of operation for each initiation relay.

~~[The Frequency of [31] days is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any [31] day interval is a rare event.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

SR 3.3.~~7~~.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

~~SR 3.3.7.5~~

~~A CHANNEL FUNCTIONAL TEST is performed on the manual CPIS actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ 1

~~This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the Function. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every 18 months.~~ 1 2

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ 2

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.7.6~~

~~This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. [The 18 month Frequency is based upon plant operating experience, which shows random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

~~Testing of the final actuating devices, which make up the bulk of the response time, is included. Testing of the final actuating device in one channel is included in the testing of each actuation logic channel.~~

REFERENCES

~~1. FSAR, Section [6.2].~~

~~2~~ 1. U FSAR, Section ~~[~~7.3~~]~~.

2. UFSAR, Chapter 15

~~3. "Plant Protection System Selection of Trip Setpoint Values."~~

B 3.3 INSTRUMENTATION ~~(Analog)~~

3

Instrumentation – Refueling

B 3.3.~~7~~ Containment ~~Purge~~ Isolation ~~Signal (CPIS) (Analog)~~

3 1

6

BASES

BACKGROUND

This LCO encompasses ~~CPIS actuation, which is a plant specific instrumentation system that performs an actuation Function required for plant protection but is not otherwise included in LCO 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCOs 3.3.5 and 3.3.6. Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements applicable to them.~~

Insert 1

containment high radiation instrumentation

The ~~CPIS~~ provides protection from radioactive contamination in the containment in the event a~~n~~ irradiated fuel assembly should be severely damaged during handling.

recently

containment isolation

applicable containment isolation valves close to isolate the containment atmosphere from the outside atmosphere

The ~~CPIS~~ will detect any abnormal amounts of radioactive material in the containment and will initiate ~~purge~~ valve closure to limit the release of radioactivity to the environment. The ~~containment purge supply and exhaust valves are closed on a CPIS~~ when a high radiation level in containment is detected.

CIAS logic

logic channels

Insert 2

The ~~CPIS~~ includes two independent, redundant actuation ~~subsystems~~. ~~Where two isolation control valves are provided for a single containment penetration, each valve is controlled by a separate actuation subsystem. Where one valve is available, a single actuation subsystem initiates valve closure. One train also isolates the containment air exhaust fan, whereas the other train actuates the containment air supply fan.~~ A list of actuated valves and an additional description of the ~~CPIS~~ are included in Reference 1. Both trains of ~~CPIS~~ are actuated on a two-out-of-four coincidence from the same four containment radiation sensor ~~subsystems~~. ~~Containment purge isolation also occurs on a Containment Isolation Actuation Signal (CIAS). The CIAS is addressed by~~ LCO 3.3.4, "Engineered Safety Features Actuation System (ESFAS) ~~Instrumentation~~."

1

CIAS

s

Insert 3

Logic and Manual Trip

Trip Setpoints and Allowable Values

~~Trip setpoints used in the bistables are based on the analytical limits stated in Reference 2.~~ The selection of ~~these~~ trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Value~~s~~

the

1

INSERT 1

containment radiation instrumentation which monitors radiation levels in the containment to automatically close at least one containment isolation valve in each penetration that provides direct access from the containment atmosphere to the outside atmosphere following a fuel handling accident (FHA). The containment isolation requirements during refueling are specified in LCO 3.9.3, "Containment Penetrations."

1

INSERT 2

Four channels of containment high radiation instrumentation, with a sensing range of 10 mR/hr to 10,000 R/hr, are provided to the containment isolation actuation signal (CIAS) logic.

1

INSERT 3

Each containment isolation valve is actuated by its associated CIS channel. The instrumentation requirements associated with containment isolation actuation while the unit is operating are addressed in LCO 3.3.3, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," and

BASES

BACKGROUND (continued)

specified in SR 3.3.~~7~~ 6.2 ~~are~~ is conservatively adjusted with respect to the ~~analytical~~ design basis limit~~s~~. ~~A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in "Plant Protection System Selection of Trip Setpoint Values" (Ref. 3).~~ The actual nominal trip setpoint entered into the bistable is normally ~~still~~ more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.

~~Setpoints in accordance with the Allowable Value will ensure that Safety Limits are not violated during anticipated operational occurrences (AOOs) and the consequences of Design Basis Accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.~~

Insert 4

APPLICABLE SAFETY ANALYSES

The ~~CPIS~~ containment high radiation instrumentation satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Only the Allowable Value~~s are~~ is specified for ~~each~~ the trip Function in the LCO. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable, provided that the difference between the nominal trip setpoint and the Allowable Value is equal to or greater than the drift allowance ~~assumed for each trip in the transient and accident analyses~~.

~~Each~~ The Allowable Value specified is more conservative than the ~~analytical~~ design basis limit ~~assumed in the transient and accident analysis~~ in order to account for instrument uncertainties appropriate to the trip Function. ~~These uncertainties are defined in Reference 3.~~ A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

The Bases for the LCO on the ~~CPIS~~ containment high radiation instrumentation are discussed below for each Function:

~~a. Manual Trip~~

~~The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CPIS Function if any parameter is trending toward its setpoint. At least one channel must be OPERABLE to be consistent with the requirements of LCO 3.9.3, "Containment Penetrations."~~

1

1

INSERT 4

The FHA is a postulated event that involves dropping a single irradiated fuel assembly resulting in damage to the assembly (Ref. 2). The FHA analysis assumes movement of an irradiated fuel assembly that has not occupied part of a critical reactor core within the previous 72 hours. Additionally, containment closure is not assumed for an FHA in the containment. The Technical Requirements Manual includes a decay time requirement that no fuel movement will commence until 72 hours after shutdown. This ensures that the FHA assumptions, including an open containment, are preserved. In the event an FHA in the containment occurs within 72 hours of a unit shutdown, actuation of the CIS when high radiation is indicated in the containment will isolate the containment from the outside environment to minimize the consequences of this improbable event.

BASES

LCO (continued)

~~b~~ a. Containment Radiation - High

Insert 5 ~~The LCO on the radiation channels requires that all four be OPERABLE.~~

~~[For this unit, the basis for the Containment Radiation - High setpoint is as follows:]~~

~~c~~ b. Actuation Logic

Insert 6 ~~One train of Actuation Logic must be OPERABLE to be consistent with the requirements of LCO 3.9.3. If one fails, it must be restored to OPERABLE status.~~

2

APPLICABILITY

In MODE 5 or 6, the ~~CPIS isolation of containment purge valves~~ containment high radiation instrumentation is not required to be OPERABLE. However, during movement of ~~[~~recently~~]~~ irradiated fuel ~~[~~(i.e., fuel that has occupied part of a critical reactor core within the previous ~~[X] days)]~~ 72 hours), there is the possibility of ~~a fuel handling accident~~ an FHA requiring the ~~CPIS~~ isolation of penetrations providing direct access from the containment atmosphere to the outside atmosphere on high radiation in containment. Accordingly, the ~~CPIS~~ containment high radiation instrumentation must be OPERABLE during movement of ~~[~~recently~~]~~ irradiated fuel in containment.

2 2 1

In MODES 1, 2, 3, and 4, ~~the containment purge valves are sealed closed~~ Insert 7.

ACTIONS

A ~~CPIS~~ containment high radiation monitor channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the actual trip setpoint is not within the Allowable Value in SR 3.3.~~7~~ 6.2, the channel is inoperable and the appropriate Conditions must be entered.

~~In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel should be declared inoperable and the LCO Condition entered for the particular protective function affected.~~

1 **INSERT 5**

With one Containment Radiation – High channel inoperable, three OPERABLE channels remain available to actuate the CIS logic train concurrent with an additional single failure. Therefore, the LCO requires three of four channels to be OPERABLE.

During refueling conditions, closure of containment isolation valves associated with containment penetrations with direct access from the containment atmosphere to the outside atmosphere on high containment radiation is particularly important since other CIS input parameters are not available (i.e., low pressurizer pressure is bypassed and there is no mechanism for creating a containment pressure transient). With the reactor shutdown, the background radiation seen by the CIS detectors drops by a factor of 10 or more. For these reasons the Containment Radiation - High setpoint requires a much lower setpoint during refueling.

1 **INSERT 6**

Since LCO 3.9.3 requires, in part, an OPERABLE containment isolation valve for each penetration providing direct access from the containment atmosphere to the outside atmosphere, only one train of Actuation Logic associated with the required containment isolation valves is required to be OPERABLE.

1 **INSERT 7**

When movement of irradiated fuel assemblies within containment is not being conducted, the potential for an FHA within the containment does not exist. Therefore, due to radioactive decay, an FHA that involves handling non-recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core longer than 72 hours) will result in doses that are well within the guideline values specified in 10 CFR 50.67 even with the containment atmosphere having direct access to the outside atmosphere. Therefore, under these conditions, isolation of the containment penetrations providing direct access to the outside environment, including the associated containment area high radiation instrumentation, is not required to be OPERABLE.

In MODES 1, 2, 3, and 4, LCO 3.3.3 provide instrumentation requirements associated with containment isolation on high containment radiation.

BASES

ACTIONS (continued)

~~When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.~~

~~A.1 and A.2~~

~~Condition A applies to the failure of one Containment Radiation - High CPIS channel. The Required Action is to place the affected channel in the trip condition within 4 hours. The Completion Time accounts for the fact that three redundant channels monitoring containment radiation are still available to provide a single trip input to the CPIS logic to provide the automatic mitigation of a radiation release. Alternately, action must be taken to place the unit in a condition where the LCO does not apply. This does not preclude the movement of fuel to a safe position.~~

~~B~~A.1 and ~~B~~A.2

Condition ~~B~~ A applies to the failure of the required ~~Manual Trip or~~ automatic Actuation Logic train, or to the failure of ~~more than~~ one or more required radiation monitoring channels~~, or if the Required Action and associated Completion Time of Condition A are not met~~. Required Action ~~B~~A.1 is to place ~~the containment purge and exhaust isolation valves~~ at least one containment isolation valve in each penetration providing direct access from containment atmosphere to outside atmosphere in the closed position. The Required Action immediately performs the isolation Function of the ~~CPIS~~ CIAS. Required Action ~~B~~A.2 is to immediately enter the applicable Conditions and Required Actions for the affected isolation valves of LCO 3.9.3, "Containment Penetrations," that were made inoperable by the inoperable instrumentation~~ of the CPIS LCO~~. The Required Action directs the operator to take actions that are appropriate for the containment isolation Function ~~of the CPIS without initiating the containment air supply and exhaust fans~~. The Completion Time accounts for the fact that the automatic capability to isolate containment ~~and initiate supply and exhaust fans~~ on a valid containment high radiation signal~~s~~ is degraded during conditions in which a fuel handling accident is possible ~~and CPIS provides the only automatic mitigation of radiation release~~.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.~~7~~.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 transmitter or the signal processing equipment has drifted outside its limits.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.~~7~~ 6.2

A CHANNEL FUNCTIONAL TEST is performed on each containment radiation monitoring channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any [92] day interval is a rare event.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

SR 3.3.~~7~~ 6.3

Proper operation of the initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic. This will actuate the Function, operating ~~all~~ the associated equipment. Proper operation of the equipment actuated by ~~each~~ the train is thus verified. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ A Note indicates this Surveillance includes verification of operation for each initiation relay. 1

~~[The Frequency of [31] days is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any [31] day interval is a rare event.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

6

SR 3.3.~~7~~.4 3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 2

~~OR~~ 2

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

~~SR 3.3.7.5~~

~~A CHANNEL FUNCTIONAL TEST is performed on the manual CPIS actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~ 1

~~This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the Function. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every 18 months.~~ 1 2

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ 2

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~--]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.7.6~~

~~This Surveillance ensures that the train actuation response times are less than or equal to the maximum times assumed in the analyses. [The 18 month Frequency is based upon plant operating experience, which shows random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

~~Testing of the final actuating devices, which make up the bulk of the response time, is included. Testing of the final actuating device in one channel is included in the testing of each actuation logic channel.~~

REFERENCES

~~1. FSAR, Section [6.2].~~

~~2~~ 1. U FSAR, Section ~~[~~7.3~~]~~.

2. UFSAR, Chapter 15

~~3. "Plant Protection System Selection of Trip Setpoint Values."~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, BASES, CONTAINMENT ISOLATION INSTRUMENTATION – REFUELING

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.7 to 3.3.6, title is changed to “Containment Isolation Instrumentation – Refueling” and “(Analog)” is deleted from the title.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.6, CONTAINMENT ISOLATION INSTRUMENTATION – REFUELING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 7

3.3.7, Control Room Isolation Signal (CRIS)

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

3/4.3.3 ~~MONITORING INSTRUMENTATION~~ CONTROL ROOM ISOLATION SIGNAL (CRIS)

A02

~~RADIATION MONITORING~~

LIMITING CONDITION FOR OPERATION

M02

LCO 3.3.7 3.3.1 ~~The radiation monitoring instrumentation channels shown in Table 3.3-6~~ One CRIS channel per intake and one automatic actuation logic train shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-6.~~ MODES 1, 2, 3, 4, 5 and 6, During movement of irradiated fuel assemblies.

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ M01

M02

Condition A b. With one or more ~~radiation monitoring~~ required CRIS channels or one required automatic actuation logic inoperable, ~~take the ACTION shown in Table 3.3-6.~~ A02

~~c. The provisions of Specification 3.0.3 are not applicable.~~ M03

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1
SR 3.3.7.2
SR 3.3.7.4 4.3.3.1 Each ~~radiation monitoring instrumentation~~ required CRIS channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program. Add proposed SR 3.3.7.3 M02

SR 3.3.7.5 4.3.3.2 In accordance with the Surveillance Frequency Control Program, ~~each Control Room Isolation radiation monitoring instrumentation~~ required CRIS channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABLE MODES~~	~~ALARM/TRIP SETPOINT~~	~~MEASUREMENT RANGE~~	~~ACTION~~	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area	1	*	$\leq$ 15 mR/hr	$10^{-1} - 10^{4}$ mR/hr	13	See ITS 3.3.8
b. Containment (CIS)	3	****	$\leq$ 90 mR/hr	$1 - 10^{5}$ mR/hr	16	See ITS 3.3.6
c. Containment Area – Hi Range	1	1, 2, 3, & 4	$\leq$ 10 R/hr	$1 - 10^{7}$ R/hr	15	See ITS 3.3.9
LCO 3.3.7 Applicability SR 3.3.7.2 d. Control Room Isolation Signal (CRIS)	1 per intake	ALL MODES and during movement of irradiated fuel assemblies.	$\leq$ 320 cpm	~~$10 - 10^{7}$ cpm~~	~~17~~	LA01 M04
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 - 10^{6}$ cpm	14	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 - 10^{6}$ cpm	14	

* With fuel in the storage pool or building. See ITS 3.3.8

**** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~TABLE NOTATION~~

ACTION 12 - DELETED

ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 14 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 15 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s),and

2) Prepare and submit a Special Report to the Commission pursuant to Specification6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

ACTION 16 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION A

ACTION B Note

~~ACTION 17~~ - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

Add proposed ACTION B

L01

Add proposed ACTION C

M04

INSTRUMENTATION

3/4.3.3 ~~MONITORING INSTRUMENTATION~~ CONTROL ROOM ISOLATION SIGNAL (CRIS)

A02

~~RADIATION MONITORING INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

M02

LCO 3.3.7 3.3.3.1 ~~The radiation monitoring instrumentation channels shown in Table 3.3-6~~ One CRIS channel per intake and one automatic actuation logic train shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-6.~~ MODES 1, 2, 3, 4, 5 and 6, During movement of irradiated fuel assemblies.

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ M01

Condition A b. With one or more required CRIS ~~radiation monitoring~~ channels or one required automatic actuation logic inoperable, take the ~~ACTION shown in Table 3.3-6.~~ M02 A02

~~c. The provisions of Specification 3.0.3 are not applicable.~~ M03

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1
SR 3.3.7.2
SR 3.3.7.4 4.3.3.1 Each required CRIS ~~radiation monitoring instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program. Add proposed SR 3.3.7.3 M02

SR 3.3.7.5 4.3.3.2 In accordance with the Surveillance Frequency Control Program, ~~each Control Room Isolation radiation monitoring instrumentation~~ required CRIS channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABLE MODES~~	~~ALARM/TRIP SETPOINT~~	~~MEASUREMENT RANGE~~	~~ACTION~~	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area						
i. Criticality and Ventilation System Isolation Monitor	4	*	≤ 20 mR/hr	$10^{-1} - 10^{4}$ mR/hr	22	See ITS 3.3.8
b. Containment Isolation	3	****	≤ 90 mR/hr	$1 - 10^{7}$ mR/hr	25	See ITS 3.3.6
c. Containment Area – Hi Range	1	1, 2, 3 & 4	Not Applicable	$1 - 10^{7}$ R/hr	27	See ITS 3.3.9
LCO 3.3.7 Applicability SR 3.3.7.2 d. Control Room Isolation Signal (CRIS)	1 per intake	ALL MODES and during movement of irradiated fuel assemblies.	≤ 320 cpm	~~$10^{-7} - 10^{-2}$ μCi/cc~~	~~26~~	LA01 M04
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10^{-7} - 10^{-2}$ μCi/cc	23	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 - 10^{7}$ cpm	23	

* With fuel in the storage pool or building. See ITS 3.3.8

**** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~ACTION STATEMENTS~~

ACTION 22 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 24 - DELETED

ACTION 25 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION A

~~ACTION 26~~ - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION B Note

ACTION 27 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s), and

2) Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

Add proposed ACTION B

L01

Add proposed ACTION C

M04

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.3.3.1 specifies requirements for radiation monitoring instrumentation and list the requirements for each functional unit in CTS Table 3.3-6, including the control room isolation monitoring instrumentation. ITS 3.3.7 provides requirements for the control room isolation signal instrumentation and provides the requirements in the LCO, Applicability, ACTIONS, and Surveillance Requirements. This changes the CTS by presenting the instrument requirements without use of an instrument table. This change is acceptable as it results solely from the change in the format and presentation of the CTS necessary to conform to the ISTS. As the proposed change is the result of changes in the format and presentation of the CTS requirements, it is designated administrative.

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. Upon declaring a required channel inoperable, CTS Table 3.3-6, Action 17 (Unit 1) and Action 26 (Unit 2) requires placing the CREVS in the recirculation mode of operation. ITS 3.3.6 requires the required channels to be declared inoperable immediately when the actuation setting exceeds the setpoint specified in SR 3.3.6.2 and associated actions must be performed. This changes the CTS by deleting the 4 hour allowance to declare a channel inoperable and requiring the channel to be declared inoperable immediately upon discovery that the channel is outside the required setpoint value.

The purpose of CTS 3.3.3.1 Action a is to provide a short time period to restore an inoperable channel prior to requiring additional action. CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. When LCO 3.3.6 is not met (e.g., SR 3.3.6.2 not met), LCO 3.0.2 requires the associated ACTIONS to be entered with no delay. Each radiation channel provides input to the associated control room ventilation isolation dampers. Therefore, the ITS action is considered appropriate. This change is designated as more restrictive because the Completion Time to declare the instrument channel inoperable following discovery of the channel exceeding it associated trip setpoint has been reduced.

M02 CTS 3.3.3.1 specifies requirements for radiation monitoring instrumentation and list the requirements for each functional unit in CTS Table 3.3-6, including the Control Room outside air intake radiation monitoring instrument channels. ITS 3.3.7 also includes requirements for the control room isolation radiation monitoring instrument channels but also includes requirements for one automatic actuation logic train. LCO 3.3.7 requires, in part, one automatic Actuation Logic train to be OPERABLE and SR 3.3.7.3 requires performance of a CHANNEL FUNCTIONAL TEST on the required Actuation Logic train with a note specifying that testing of the Actuation Logic shall include verification of the proper operation of each initiation relay. The SR Frequency is proposed to be in accordance with the Surveillance Frequency Control Program (SFCP). This changes the CTS by adding requirements in the ITS associated with one train of control room isolation instrument logic.

The purpose of the control room isolation radiation monitoring instrumentation requirements is to ensure isolation capability is maintained with the ability to isolate the control room atmosphere. At least one automatic actuation logic train is required to ensure the applicable control room ventilation dampers receive an isolation signal from the control room isolation radiation monitoring instrument channels. Therefore, these requirements are appropriate and necessary to ensure the radiation monitoring instrumentation can perform its intended safety function. This change is consistent with ISTS 3.3.8.

PSL controls periodic Frequencies for Surveillances in accordance with the SFCP per CTS 6.8.4.o (Unit 1) and CTS 6.8.4.q (Unit 2). Therefore, the initial periodic Frequency for ITS SR 3.3.7.3 in accordance with the SFCP will be 31 days consistent with the CHANNEL FUNCTIONAL TEST testing frequency for ISTS SR 3.3.8.3. The periodic Frequency is acceptable based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of one automatic actuation logic channel in any 31 day interval is a rare event.

The SFCP was established as described in FPL (PSL Unit 1 and Unit 2) "Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program" (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066).

M03 CTS 3.3.3.1 Action c states that the provisions of Specification 3.0.3 are not applicable. ITS 3.3.7 does not include exceptions to the applicability of LCO 3.0.3. CTS 3.0.3 (ITS LCO 3.0.3) does not apply in MODES 5 and 6, which encompasses the condition of during movement of recently irradiated fuel assemblies within the containment. This changes the CTS by adding the applicability of LCO 3.0.3 when in MODES 1, 2, 3, and 4.

The purpose of the control room isolation function is to ensure a habitable environment for the control room operators. This change is acceptable because LCO 3.0.3 is applicable in MODES 1, 2, 3, and 4 to implement actions when an LCO is not met and either an associated Required Action and Completion is not met with no Condition applicable; or the condition is not specifically addressed by the associated ACTIONS. This change is designated as more restrictive because it adds an additional requirement not in the CTS.

M04 CTS 3.3.3.1 does not explicitly require CRIS to be OPERABLE during movement of irradiated fuel assemblies and does not require the suspension of irradiated fuel assembly movement when control room isolation radiation monitoring channels or actuation logic is inoperable. ITS 3.3.7 Applicability includes the condition, "During movement of irradiated fuel assemblies," consistent with the CTS 3.7.7.1 (Unit 1) and CTS 3.7.7 (Unit 2) Applicability for the Control Room Emergency Ventilation System. In addition, ITS 3.3.7, Required Action C.2 requires the suspension of movement of irradiated fuel assemblies when required actuation logic or radiation monitors are inoperable during movement of irradiated fuel assemblies if one CREVS train cannot be placed in the recirculation mode. This changes CTS by revising the applicability to include the condition of," during movement of irradiated fuel assemblies," and adding the requirement to suspend movement of irradiated fuel assemblies when the control room isolation radiation monitoring actuation logic or monitoring becomes inoperable while in MODES 5 or 6; or, moving irradiated fuel assemblies.

The purpose of the Applicability and action to suspend movement of irradiated fuel assemblies recognizes the fact that the radiation signals are the only Functions available to initiate control room isolation in the event of a fuel handling accident. This change is designated as more restrictive because the change expands the Applicability to include a specified condition and adds a required action that CTS does not have.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 - Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6 for radiation monitoring instrumentation has a column specifying the Measurement Range and a specific measurement range for the control room isolation radiation instrumentation. ITS 3.3.7 does not retain the "MEASUREMENT RANGE" column or the specific measurement range of the radiation monitor channels. This changes the CTS by moving the instrument measurement range to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. This change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 - Relaxation of Required Action)* CTS Action b requires when one or more radiation monitoring channels are inoperable to take the ACTION shown in Table 3.3-6. When the minimum number of required control room isolation radiation monitoring channels are inoperable Table 3.3-6 ACTION 17 (Unit 1) and ACTION 26 (Unit 2) require that the control room ventilation system be placed in the recirculation mode of operation within 1 hour. CTS 3.3.3.1 does not specifically address additional required actions if ACTION 17 (Unit 1) and ACTION 26 (Unit 2) cannot meet the required actions. Under similar conditions, ITS 3.3.7 Condition B requires the unit to be in MODE 3 within 6 hours and MODE 4 within 12 hours. Consistent with the ISTS and the CREV Specification ACTIONS, proposed Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. This changes the CTS by allowing a unit shutdown to MODE 4 in lieu of an LCO 3.0.3 shutdown to cold shutdown conditions (MODE 5).

If the required CRIS channel cannot be restored to OPERABLE status, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours (Required Action B.1) and to MODE 4 within 12 hours (Required Action B.2). Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5. In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

This change is acceptable since it provides for an orderly shutdown to hot shutdown condition (MODE 4) if the train is not placed in the recirculation mode within 1 hour and the modification of the end state is consistent with CE-NPSD-1186-A, Revision 00, “Technical Justification for the Risk-Informed Modification to Selected Required Action End States for CEOG Member PWRs,” dated October 2001 (ADAMS Accession No. 110410539). In addition, this allowance is consistent with that provided in the CREVS Specification, when an actual train is inoperable. Once the unit is in MODE 4, the probability of an event requiring the CREVS is minimized. This change is designated as less restrictive because the ITS provides an alternate action than is not currently allowed in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~ 2

3.3.~~8~~ 7 Control Room Isolation Signal (CRIS) ~~(Analog)~~ 1 2

LCO 3.3.3.1 M02 — LCO 3.3.~~8~~ 7 One CRIS channel per intake and one automatic logic train shall be OPERABLE.

Applicability — APPLICABILITY: MODES 1, 2, 3, 4, ~~[~~5, and 6~~]~~, During movement of ~~[recently]~~ irradiated fuel assemblies. 3

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-6 Action 17 M02 M03	A. One required CRIS ~~Manual Trip~~, automatic Actuation Logic, or ~~[~~one or more required ~~channels of particulate/iodine or gaseous]~~ radiation monitors inoperable in MODE 1, 2, 3, or 4.	A.1 ~~-------------NOTE------------- Place Control Room Emergency Air Cleanup System (CREACS) in toxic gas protection mode if automatic transfer to toxic gas protection mode inoperable. ---------------------------------~~ Place one ~~CREACS~~ CREVS train in ~~emergency radiation protection~~ recirculation mode.	1 hour
L01	B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 --------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. -------------------------------------- Be in MODE 4.	6 hours 12 hours

Table 3.3-6 Action 17

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M04 C. One required CRIS ~~Manual Trip,~~ automatic Actuation Logic, or ~~[one or more required channels of particulate/iodine or gaseous]~~ radiation monitors inoperable ~~[~~in MODE 5 or 6~~]~~, during movement of ~~[recently]~~ irradiated fuel assemblies.	C.1 ~~-----NOTE----- Place CREACS in toxic gas protection mode if automatic transfer to toxic gas protection mode inoperable. ---------------~~ Place one ~~CREACS~~ CREVS train in ~~emergency radiation protection~~ recirculation mode.	Immediately 3 1 3
	<u>OR</u>	
	C.2.~~1~~ Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately 4 3
	~~AND~~	
	~~C.2.2 -----NOTE----- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. ---------------~~	4
	~~Suspend positive reactivity additions.~~	~~Immediately~~

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.3.3.1	SR 3.3.~~8~~.1 7	Perform a CHANNEL CHECK on ~~the~~ each required control room radiation monitor channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
4.3.3.1	SR 3.3.~~8~~.2 7	Perform a CHANNEL FUNCTIONAL TEST on the required CRIS radiation monitor channel. Verify CRIS high radiation setpoint is less than or equal to the Allowable Value of ~~[6E4]~~ 320 cpm above normal background.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1 2 3

2 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
M02	SR 3.3.~~8~~.3 7	------------------------------NOTE~~S~~------------------------------ ~~1.~~ Surveillance of Actuation Logic shall include verification of the proper operation of each initiation relay. ~~2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested within the previous 6 months.~~ --		2 1
		Perform a CHANNEL FUNCTIONAL TEST on the required CRIS Actuation Logic channel.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3
4.3.3.1	SR 3.3.~~8~~.4 7	Perform a CHANNEL CALIBRATION on the required CRIS radiation monitor channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
~~SR 3.3.8.5~~	~~Perform a CHANNEL FUNCTIONAL TEST on the required CRIS Manual Trip channel.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~
4.3.3.2 SR 3.3.~~8.6~~ 7.5	~~[~~ Verify response time of required CRIS channel is within limits.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~

1 2 3

CTS

3.3 INSTRUMENTATION ~~(Analog)~~ 2

3.3.~~8~~ 7 Control Room Isolation Signal (CRIS) ~~(Analog)~~ 1 2

LCO 3.3.3.1 M02 LCO 3.3.~~8~~ 7 One CRIS channel per intake and one automatic logic train shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2, 3, 4, ~~[~~5, and 6~~]~~, 3
During movement of ~~[recently]~~ irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
Table 3.3-6 Action 26 M02 M03 A. One required CRIS ~~Manual Trip~~, automatic Actuation Logic, or ~~[~~one or more required ~~channels of particulate/iodine or gaseous]~~ radiation monitors inoperable in MODE 1, 2, 3, or 4.	A.1	~~-------------NOTE------------- Place Control Room Emergency Air Cleanup System (CREACS) in toxic gas protection mode if automatic transfer to toxic gas protection mode inoperable. ---------------------------------~~ Place one ~~CREACS~~ CREVS train in ~~emergency radiation protection~~ recirculation mode.	1 hour 3 1
L01 B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
Table 3.3-6 Action 26	B.2	--------------NOTE-------------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------------------------------- Be in MODE 4.	12 hours

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M04 C. One required CRIS ~~Manual Trip,~~ automatic Actuation Logic, or ~~[one or more required channels of particulate/iodine or gaseous]~~ radiation monitors inoperable ~~[~~in MODE 5 or 6~~]~~, during movement of ~~[recently]~~ irradiated fuel assemblies.	C.1 ~~-------------NOTE------------- Place CREACS in toxic gas protection mode if automatic transfer to toxic gas protection mode inoperable. ------------------------------~~ Place one ~~CREACS~~ CREVS train in ~~emergency radiation protection~~ recirculation mode.	Immediately 3 1 3
	<u>OR</u>	
	C.2~~.1~~ Suspend movement of ~~[recently]~~ irradiated fuel assemblies.	Immediately 4 3
	~~AND~~	
	~~C.2.2 -------------NOTE------------- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. ------------------------------~~ ~~Suspend positive reactivity additions.~~	~~Immediately~~ 4

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.3.3.1	SR 3.3.~~8~~.1 7	Perform a CHANNEL CHECK on ~~the~~ each required control room radiation monitor channel.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 1 2 3
4.3.3.1	SR 3.3.~~8~~.2 7	Perform a CHANNEL FUNCTIONAL TEST on the required CRIS radiation monitor channel. Verify CRIS high radiation setpoint is less than or equal to the Allowable Value of ~~[6E4]~~ 320 cpm above normal background.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 2 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
M02	SR 3.3.~~8~~.3 7	-----------------------------NOTE~~S~~---------------------------- ~~1.~~ Surveillance of Actuation Logic shall include verification of the proper operation of each initiation relay. ~~2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested within the previous 6 months.~~ -- Perform a CHANNEL FUNCTIONAL TEST on the required CRIS Actuation Logic channel.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 1 3
4.3.3.1	SR 3.3.~~8~~.4 7	Perform a CHANNEL CALIBRATION on the required CRIS radiation monitor channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 3

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
	~~SR 3.3.8.5~~ ~~Perform a CHANNEL FUNCTIONAL TEST on the required CRIS Manual Trip channel.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	1
4.3.3.2	SR 3.3.~~8.6~~ 7.5 ~~[~~ Verify response time of required CRIS channel is within limits.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	2 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM ISOLATION SIGNAL (CRIS)

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.8 to 3.3.7 and “(Analog)” is deleted from the title.

3. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

4. Required Action C.2.2 and associated Note are not included in the ITS consistent with the PSL current licensing basis. The boron dilution event analysis for MODES 5 and 6 does not assume operation of the Control Room Emergency Ventilation System or the associated control room isolation signal actuation instrumentation. Therefore, the ISTS Required Action to suspend positive reactivity additions with one CRIS automatic actuation logic or radiation monitor channel inoperable in MODE 5 or 6 is unnecessary. As a result, Required Action C.2.1 is renumbered to C.2.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~ 2

7

B 3.3.~~8~~ Control Room Isolation Signal (CRIS) ~~(Analog)~~ 2

BASES

BACKGROUND

This LCO encompasses CRIS actuation, which is a plant specific instrumentation channel that performs an actuation Function required for plant protection but is not otherwise included in LCO 3.3.~~5~~, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)~~." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements~~,~~ is not included in LCO 3.3.~~5 and LCO 3.3.6~~. ~~Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements that are applicable to them.~~ 4 Actuation 4 6 6

Control Room Emergency Ventilation

The CRIS terminates the normal supply of outside air to the control room and initiates actuation of the ~~Emergency Radiation Protection~~ System to minimize operator radiation exposure. The CRIS includes two independent, redundant subsystems, including actuation trains. Each train employs two separate sensors. ~~One sensor detects gaseous activity. The other detects particulate and iodine activity. Since the two sensors detect different types of activity, they are not considered redundant to each other. However, since there are separate sensors in each train, the trains are redundant.~~ If the bistable monitoring either sensor indicates an unsafe condition, that train will be actuated (one-out-of-two logic). The two trains actuate separate equipment. Actuating either train will perform the intended function. Control room isolation also occurs on a ~~Safety Injection Actuation Signal (SIAS)~~. 1

Containment Isolation Signal (CIS)

<u>Trip Setpoints and Allowable Values</u>

selection of a setpoint as low as possible without causing spurious alarms or actuations

Trip setpoints used in the bistables are based on the ~~analytical limits~~ (Ref. 1). The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in LCO 3.3.~~8~~ are conservatively adjusted with respect to the ~~analytical limits~~. ~~A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in "Plant Protection System Selection of Trip Setpoint Values" (Ref. 2).~~ The actual nominal trip setpoint entered into the bistable is ~~normally~~ still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the surveillance interval. ~~If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.~~ 7 setpoint 2

BASES

BACKGROUND (continued)

Setpoints in accordance with the Allowable Value will ensure that Safety Limits are not violated during anticipated operational occurrences (AOOs) and the consequences of Design Basis Accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.

APPLICABLE SAFETY ANALYSES

The CRIS, in conjunction with the Control Room Emergency Ventilation ~~Air Cleanup~~ System (CRE~~AC~~VS), maintains the control room atmosphere within conditions suitable for prolonged occupancy throughout the duration of any one of the accidents discussed in Reference ~~1~~ 2. The radiation exposure of control room personnel, through the duration of any one of the postulated accidents discussed in "Accident Analysis," UFSAR, Chapter ~~[~~15~~]~~ (Ref. ~~1~~ 2), does not exceed the limits set by 10 CFR 50, Appendix A, GDC 19 (Ref. 3). 1 3

LOCA is not a limiting event because the CIS is credited for isolation of the Control Room, no credit is taken for isolation on high radiation in the accident analysis.

The CRIS satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

LCO 3. 3.~~8~~ 7 requires one channel of CRIS to be OPERABLE. The required channel consists of Actuation Logic, ~~Manual Trip,~~ and ~~particulate/iodine and gaseous~~ radiation monitors. The specific Allowable Value~~s~~ for the setpoint~~s~~ of the CRIS ~~are~~ is listed in the SRs. 2

Only the Allowable Value~~s~~ ~~are~~ is specified for ~~each~~ the trip Function in the LCO. Operation with a trip setpoint less conservative ~~than the nominal trip setpoint,~~ but within its Allowable Value, is acceptable, provided that the difference between the ~~nominal~~ trip setpoint and the Allowable Value is equal to or greater than the drift allowance assumed ~~for each trip~~ in the ~~transient and accident~~ analyses. 1

~~Each~~ The Allowable Value specified is more conservative than the ~~analytical limit assumed in the transient and accident analysis~~ setpoint in order to account for instrument uncertainties appropriate to the trip Function. These uncertainties are defined in Reference ~~2~~ 4. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

The Bases for the LCO on the CRIS are discussed below for each Function:

BASES

LCO (continued)

a. ~~Manual Trip~~

~~The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CRIS Function if any parameter is trending toward its setpoint. One channel must be OPERABLE. This considers that the Manual Trip capability is a backup and that other means are available to actuate the redundant train if required, including manual SIAS.~~ 1

~~b.~~ ~~Airborne~~ Radiation

One ~~Both~~ channel~~s~~ of ~~Airborne~~ Radiation detection in each ~~the~~ required train is ~~are~~ required to be OPERABLE to ensure the control room isolates ~~on either high iodine and high particulate or gaseous concentration~~.

~~[~~For this unit, the basis for the Allowable Value is as follows:~~]~~ 3

A background reading of approximately 40 cpm is typical for the air intake radiation monitors. An actuation setpoint of ≤ 320 cpm is consistent with the EPRI TR-102644 setpoint value recommendation of 8 times background. 1

b. ~~c.~~ Actuation Logic

One train of Actuation Logic must be OPERABLE, since there are alternate means available to actuate the redundant train, including CIS ~~SIAS~~. 1

APPLICABILITY

The CRIS Functions must be OPERABLE in MODES 1, 2, 3, 4, ~~[~~5, and 6~~]~~ and during movement of ~~[recently]~~ irradiated fuel assemblies ~~[(i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~ to ensure a habitable environment for the control room operators. 3

~~REVIEWER'S NOTE~~
~~For those plants that credit gas decay tank rupture accidents, the CRIS must also be OPERABLE in MODES 5 and 6.~~ 4

ACTIONS

A CRIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the ~~plant~~ specific setpoint ~~analysis~~. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not within the Allowable Value, the channel is inoperable and the appropriate Conditions must be entered. 1

BASES

ACTIONS (continued)

A.1, B.1, B.2, C.1, C.2~~.1,~~ and ~~C.2.2~~

~~Conditions A and C have been modified by a Note, which specifies that CREACS be placed manually in the toxic gas protection mode if the automatic transfer to the toxic gas protection mode is inoperable. [At this unit, the basis for this Note is as follows:]~~

Conditions A, B, and C are applicable to ~~manual and~~ automatic actuation of the CRE~~AC~~S by CRIS. Condition A applies to the failure of the CRIS ~~Manual Trip,~~ Actuation Logic~~, and required particulate/iodine~~ and required ~~gaseous~~ radiation monitor channels in MODE 1, 2, 3, or 4. Entry into this Condition requires action to either restore the failed channel(s) or manually perform the CRIS safety function (Required Action A.1). The Completion Time of 1 hour is sufficient to complete the Required Actions and accounts for the fact that CRIS supplements control room isolation by other Functions (e.g., CIS ~~SIAS~~) in MODES 1, 2, 3, and 4. If the channel cannot be restored to OPERABLE status, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours (Required Action B.1) and to MODE 4 within 12 hours (Required Action B.2).

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 5 ~~4~~). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.

Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

BASES

ACTIONS (continued)

The Completion Times of 6 hours and 12 hours for reaching MODES 3 and 4 from MODE 1 are reasonable, based on operating experience and normal cooldown rates, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant safety systems or operators.

Condition C applies to the failure of CRIS ~~Manual Trip,~~ Actuation Logic~~,~~ and required ~~particulate/iodine and required gaseous~~ radiation monitor ~~channels~~ ~~[~~in MODE 5 or 6~~]~~ or when moving ~~[recently]~~ irradiated assemblies. The Required Actions are immediately taken to place one OPERABLE CRE~~AC~~S train in the ~~emergency radiation protection~~ mode recirculation or to suspend ~~positive reactivity additions and~~ movement of ~~[recently]~~ irradiated fuel assemblies. The Completion Time recognizes the fact that the radiation signals are the only Functions available to initiate control room isolation in the event of a fuel handling accident requiring control room isolation. V 3 3 1

~~Required Action [C.2.2] is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM.~~ 5

SURVEILLANCE REQUIREMENTS

SR 3.3.~~8~~.1 7 2

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 transmitter or the signal processing equipment has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

~~At this unit, the following administrative controls and design features (e.g., downscale alarms) immediately alert operations to loss of function in the nonredundant channels.~~ 1

~~[At this unit, verification of sample system alignment and operation for gaseous, particulate, and iodine monitors is required as follows:]~~ 3

7
SR 3.3.~~8~~.2 2

A CHANNEL FUNCTIONAL TEST is performed on the required control room radiation monitoring channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any [92] day interval is a rare event.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 3

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ 4 3

SR 3.3.~~8~~7.3 2

Proper operation of the individual initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~[The Frequency of [31] days is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any [31] days interval is a rare event.~~

~~OR~~ 3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---~~ ~~]~~ 4 3

The Note ~~1~~ indicates this Surveillance includes verification of operation for each initiation relay.

~~Note 2 indicates that relays that cannot be tested at power are excepted from the Surveillance Requirement while at power. These relays must, however, be tested during each entry into MODE 5 exceeding 24 hours unless they have been tested within the previous 6 months.~~

SR 3.3.~~8~~.4 7 2

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~

~~OR~~ 3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---~~ ~~]~~ 4 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.8.5~~

~~A CHANNEL FUNCTIONAL TEST is performed on the manual CRIS actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~

~~This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the function. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

~~[~~ SR 3.3.~~8.6~~ 7.5

This Surveillance ensures that the train actuation response times are less than the maximum times assumed in the analyses. ~~[The [18] month 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.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

Testing of the final actuating devices, which make up the bulk of the response time, is included in the Surveillance testing.~~]~~

REFERENCES

1. ~~FSAR, Chapter [15].~~ EPRI Technical Report TR-102644, "Calibration of Radiation Monitors at Nuclear Power Plants."
2. ~~"Plant Protection System Selection of Trip Setpoint Values."~~ UFSAR, Chapter 15.
3. 10 CFR 50, Appendix A, GDC 19.

4. PSL-ENG-SEIS-08-017, Control Room Outside Air Intake Radiation Monitor Actuation Setpoint and Response Time Testing Basis Document.

~~4~~ 5. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

B 3.3 INSTRUMENTATION ~~(Analog)~~ 2

B 3.3.~~8~~ 7 Control Room Isolation Signal (CRIS) ~~(Analog)~~ 2

BASES

BACKGROUND

This LCO encompasses CRIS actuation, which is a plant specific instrumentation channel that performs an Actuation Function required for plant protection but is not otherwise included in LCO 3.3.~~5~~ 4, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual ~~Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)~~ Actuation." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements~~,~~ is not included in LCO 3.3.~~5 and LCO 3.3.6~~ 4. ~~Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements that are applicable to them.~~ 6 6

The CRIS terminates the normal supply of outside air to the control room and initiates actuation of the ~~Emergency Radiation Protection~~ Control Room Emergency Ventilation System to minimize operator radiation exposure. The CRIS includes two independent, redundant subsystems, including actuation trains. Each train employs two separate sensors. ~~One sensor detects gaseous activity. The other detects particulate and iodine activity. Since the two sensors detect different types of activity, they are not considered redundant to each other. However, since there are separate sensors in each train, the trains are redundant.~~ If the bistable monitoring either sensor indicates an unsafe condition, that train will be actuated (one-out-of-two logic). The two trains actuate separate equipment. Actuating either train will perform the intended function. Control room isolation also occurs on a ~~Safety Injection Actuation Signal (SIAS)~~ Containment Isolation Signal (CIS). 1

Trip Setpoints and Allowable Values

Trip setpoints used in the bistables are based on the ~~analytical limits~~ selection of a setpoint as low as possible without causing spurious alarms or actuations (Ref. 1). The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in LCO 3.3.~~8~~ 7 are conservatively adjusted with respect to the setpoint ~~analytical limits~~. ~~A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in "Plant Protection System Selection of Trip Setpoint Values" (Ref. 2).~~ The actual nominal trip setpoint entered into the bistable is ~~normally~~ still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the surveillance interval. ~~If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.~~ 2

BASES

BACKGROUND (continued)

Setpoints in accordance with the Allowable Value will ensure that Safety Limits are not violated during anticipated operational occurrences (AOOs) and the consequences of Design Basis Accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.

APPLICABLE SAFETY ANALYSES

The CRIS, in conjunction with the Control Room Emergency Ventilation ~~Air Cleanup~~ System (CREVAS) ~~(CREACS)~~, maintains the control room atmosphere within conditions suitable for prolonged occupancy throughout the duration of any one of the accidents discussed in Reference 2 ~~1~~. The radiation exposure of control room personnel, through the duration of any one of the postulated accidents discussed in "Accident Analysis," UFSAR, Chapter ~~[~~15~~]~~ (Ref. 2 ~~1~~), does not exceed the limits set by 10 CFR 50, Appendix A, GDC 19 (Ref. 3). 1

LOCA is not a limiting event because the CIS is credited for isolation of the Control Room, no credit is taken for isolation on high radiation in the accident analysis. 3

The CRIS satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

LCO 3. 3.7 ~~8~~ requires one channel of CRIS to be OPERABLE. The required channel consists of Actuation Logic, ~~Manual Trip,~~ and ~~particulate/iodine and gaseous~~ radiation monitors. The specific Allowable Value~~s~~ for the setpoint~~s~~ of the CRIS is ~~are~~ listed in the SRs. 2

Only the Allowable Value~~s~~ is ~~are~~ specified for the ~~each~~ trip Function in the LCO. Operation with a trip setpoint less conservative ~~than the nominal trip setpoint,~~ but within its Allowable Value, is acceptable, provided that the difference between the ~~nominal~~ trip setpoint and the Allowable Value is equal to or greater than the drift allowance assumed ~~for each trip~~ in the ~~transient and accident~~ analyses. 1

The ~~Each~~ Allowable Value specified is more conservative than the setpoint ~~analytical limit assumed in the transient and accident analysis~~ in order to account for instrument uncertainties appropriate to the trip Function. These uncertainties are defined in Reference 4 ~~2~~. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

The Bases for the LCO on the CRIS are discussed below for each Function:

BASES

LCO (continued)

a. ~~Manual Trip~~

~~The LCO on Manual Trip backs up the automatic trips and ensures operators have the capability to rapidly initiate the CRIS Function if any parameter is trending toward its setpoint. One channel must be OPERABLE. This considers that the Manual Trip capability is a backup and that other means are available to actuate the redundant train if required, including manual SIAS.~~ 1

~~b.~~ ~~Airborne~~ Radiation

One ~~Both~~ channel~~s~~ of ~~Airborne~~ Radiation detection in each ~~the~~ required train is ~~are~~ required to be OPERABLE to ensure the control room isolates ~~on either high iodine and high particulate or gaseous concentration~~.

~~[~~ For this unit, the basis for the Allowable Value is as follows: ~~]~~ 3

A background reading of approximately 40 cpm is typical for the air intake radiation monitors. An actuation setpoint of ≤ 320 cpm is consistent with the EPRI TR-102644 setpoint value recommendation of 8 times background. 1

b. ~~c.~~ Actuation Logic

One train of Actuation Logic must be OPERABLE, since there are alternate means available to actuate the redundant train, including CIS ~~SIAS~~. 1

APPLICABILITY

The CRIS Functions must be OPERABLE in MODES 1, 2, 3, 4, ~~[~~5, and 6~~]~~ and during movement of ~~[recently]~~ irradiated fuel assemblies ~~[(i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)]~~ to ensure a habitable environment for the control room operators. 3

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~For those plants that credit gas decay tank rupture accidents, the CRIS must also be OPERABLE in MODES 5 and 6.~~
~~--~~ 4

ACTIONS

A CRIS channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the ~~plant~~ specific setpoint ~~analysis~~. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not within the Allowable Value, the channel is inoperable and the appropriate Conditions must be entered. 1

BASES

ACTIONS (continued)

A.1, B.1, B.2, C.1, C.2~~.1,~~ and ~~C.2.2~~ 5

~~Conditions A and C have been modified by a Note, which specifies that CREACS be placed manually in the toxic gas protection mode if the automatic transfer to the toxic gas protection mode is inoperable. [At this unit, the basis for this Note is as follows:]~~

Conditions A, B, and C are applicable to ~~manual and~~ automatic actuation of the CRE~~AC~~S by CRIS. Condition A applies to the failure of the CRIS ~~Manual Trip,~~ Actuation Logic~~, and required particulate/iodine~~ and required ~~gaseous~~ radiation monitor channels in MODE 1, 2, 3, or 4. Entry into this Condition requires action to either restore the failed channel(s) or manually perform the CRIS safety function (Required Action A.1). The Completion Time of 1 hour is sufficient to complete the Required Actions and accounts for the fact that CRIS supplements control room isolation by other Functions (e.g., CIS ~~SIAS~~) in MODES 1, 2, 3, and 4. If the channel cannot be restored to OPERABLE status, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours (Required Action B.1) and to MODE 4 within 12 hours (Required Action B.2). 1

Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 5 ~~4~~). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. 1

Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

BASES

ACTIONS (continued)

The Completion Times of 6 hours and 12 hours for reaching MODES 3 and 4 from MODE 1 are reasonable, based on operating experience and normal cooldown rates, for reaching the required MODE from full power conditions in an orderly manner and without challenging plant safety systems or operators.

Condition C applies to the failure of CRIS ~~Manual Trip,~~ Actuation Logic~~,~~ and required ~~particulate/iodine and required gaseous~~ radiation monitor ~~channels~~ ~~[~~in MODE 5 or 6~~]~~ or when moving ~~[recently]~~ irradiated assemblies. The Required Actions are immediately taken to place one OPERABLE CRE~~A~~CS train in the ~~emergency radiation protection~~ recirculation mode or to suspend ~~positive reactivity additions and~~ movement of ~~[recently]~~ irradiated fuel assemblies. The Completion Time recognizes the fact that the radiation signals are the only Functions available to initiate control room isolation in the event of a fuel handling accident requiring control room isolation. 3 3 1

V

~~Required Action [C.2.2] is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM.~~ 5

SURVEILLANCE REQUIREMENTS

SR 3.3.~~8~~ 7 .1 2

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 transmitter or the signal processing equipment has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-------------------------------]~~ 3

~~At this unit, the following administrative controls and design features (e.g., downscale alarms) immediately alert operations to loss of function in the nonredundant channels.~~ 1

~~[At this unit, verification of sample system alignment and operation for gaseous, particulate, and iodine monitors is required as follows:]~~ 3

SR 3.3.~~8~~.2 7 2

A CHANNEL FUNCTIONAL TEST is performed on the required control room radiation monitoring channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency of [92] days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any [92] day interval is a rare event.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-----]~~ 3

SR 3.3.~~8~~7.3 2

Proper operation of the individual initiation relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

~~[The Frequency of [31] days is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any [31] days interval is a rare event.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ 4 3

The Note ~~1~~ indicates this Surveillance includes verification of operation for each initiation relay.

~~Note 2 indicates that relays that cannot be tested at power are excepted from the Surveillance Requirement while at power. These relays must, however, be tested during each entry into MODE 5 exceeding 24 hours unless they have been tested within the previous 6 months.~~

SR 3.3.~~8~~.4 7 2

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

~~[The Frequency is based upon the assumption of an [18] month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ 4 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.8.5~~

~~A CHANNEL FUNCTIONAL TEST is performed on the manual CRIS actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~

~~This test verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the function. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months.~~ 5

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

7.5

~~[~~ SR 3.3.~~8.6~~

This Surveillance ensures that the train actuation response times are less than the maximum times assumed in the analyses. ~~[The [18] month 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.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~

Testing of the final actuating devices, which make up the bulk of the response time, is included in the Surveillance testing.~~]~~

REFERENCES

1. ~~FSAR, Chapter [15].~~ EPRI Technical Report TR-102644, "Calibration of Radiation Monitors at Nuclear Power Plants."
2. ~~"Plant Protection System Selection of Trip Setpoint Values."~~ UFSAR, Chapter 15.
3. 10 CFR 50, Appendix A, GDC 19.
4. PSL-ENG-SEIS-08-017, Control Room Outside Air Intake Radiation Monitor Actuation Setpoint and Response Time Testing Basis Document.
~~4~~ 5. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7 BASES, CONTROL ROOM ISOLATION SIGNAL (CRIS)

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.7 to 3.3.6, title is changed to "Containment Isolation Instrumentation – Refueling" and "(Analog)" is deleted from the title.

3. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Changes have been made to reflect changes made to the Specification.

6. Changes have been made to reflect a change to the numbering of ISTS Specification 3.3.5.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.7, CONTROL ROOM ISOLATION SIGNAL (CRIS)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 8

3.3.8, Fuel Pool Area Radiation Instrumentation

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

3/4.3.3 ~~MONITORING~~ INSTRUMENTATION

~~RADIATION MONITORING~~

Fuel Pool Area High Radiation Instrumentation

A02

LIMITING CONDITION FOR OPERATION

One fuel pool area high radiation monitoring channel

LCO 3.3.8 3.3.3.1 ~~The radiation monitoring instrumentation channels shown in Table 3.3-6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-6~~.

During movement of recently irradiated fuel assemblies in the spent fuel storage pool.

L01

ACTION:

~~a.~~ ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

A02 M01

required

ACTION A ~~b.~~ With one ~~or more radiation monitoring~~ channel~~s~~ inoperable, ~~take the ACTION shown in Table 3.3-6.~~

immediately suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool.

M02

~~c.~~ ~~The provisions of Specification 3.0.3 are not applicable.~~

A03

SURVEILLANCE REQUIREMENTS

required fuel pool area high

SR 3.3.8.1
SR 3.3.8.2
SR 3.3.8.3
4.3.3.1 Each radiation monitoring ~~instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program.

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

A02

High Radiation Monitoring Instrumentation

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABLE MODES~~	ALARM~~/TRIP~~ SETPOINT	~~MEASUREMENT RANGE~~	ACTION	
~~1. AREA MONITORS~~						
LCO 3.3.8 SR 3.3.8.2 — a. Fuel ~~Storage~~ Pool Area	1	*	≤ 15 mR/hr	~~10^{-1} – 10^{4} mR/hr~~	~~13~~ A	LA01
b. Containment (CIS)	3	****	≤ 90 mR/hr	1 – 10^{5} mR/hr	16	See ITS 3.3.6
c. Containment Area – Hi Range	1	1, 2, 3, & 4	≤ 10 R/hr	1 – 10^{7} R/hr	15	See ITS 3.3.9
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	10 - 10^{7} cpm	17	See ITS 3.3.7
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10^{6} cpm	14	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10^{6} cpm	14	

Applicability * ~~With fuel in the storage pool or building.~~ During movement of recently irradiated fuel assemblies in the spent fuel storage pool. L01

**** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~TABLE NOTATION~~

~~ACTION 12 - DELETED~~

Immediately suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool.

M02

~~ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.~~

ACTION 14 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 15 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s),and

2) Prepare and submit a Special Report to the Commission pursuant to Specification6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

ACTION 16 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION 17 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

INSTRUCTION

INSTRUMENTATION

3/4.3.3 ~~MONITORING~~ INSTRUMENTATION

Fuel Pool Area High Radiation Instrumentation

~~RADIATION MONITORING INSTRUMENTATION~~

A02

LIMITING CONDITION FOR OPERATION

LCO 3.3.8 3.3.3.1 Two fuel pool area high radiation instrument trains ~~The radiation monitoring instrumentation channels shown in Table 3.3-6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-6~~ During movement of recently irradiated fuel assemblies in the spent fuel storage pool.

L01

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

A02 M01

Condition A ~~b.~~ With one instrument train ~~or more radiation monitoring channels~~ inoperable, ~~take the ACTION shown in Table 3.3-6~~ restore train to OPERABLE status within 7 days.

M02

~~c. The provisions of Specification 3.0.3 are not applicable.~~

A03 M02

Add proposed ACTION B

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1
SR 3.3.8.2
SR 3.3.8.3

4.3.3.1 Each radiation monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program.

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

~~TABLE 3.3-6~~

~~RADIATION MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~MINIMUM~~ CHANNELS OPERABLE	~~APPLICABLE MODES~~	~~ALARM/~~TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION	A02
~~1. AREA MONITORS~~						
LCO 3.3.8 a. Fuel ~~Storage~~ Pool Area						
SR 3.3.8.3 i. Criticality and Ventilation System Isolation Monitor	~~4~~ ~~2 per instrument logic~~	*	$\leq$ 20 mR/hr	~~10^{-1} – 10^{4} mR/hr~~	~~22~~ A, B	LA01
b. Containment Isolation	3	****	$\leq$ 90 mR/hr	1 – 10^{7} mR/hr	25	See ITS 3.3.6
c. Containment Area – Hi Range	1	1, 2, 3 & 4	Not Applicable	1 - 10^{7} R/hr	27	See ITS 3.3.9
d. Control Room Isolation	1 per intake	ALL MODES	$\leq$ 320 cpm	10^{-7} – 10^{-2} μCi/cc	26	See ITS 3.3.7
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10^{-7} – 10^{-2} μCi/cc	23	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10^{7} cpm	23	

* ~~With fuel in the storage pool or building~~ During movement of recently irradiated fuel assemblies in the spent fuel storage pool.

L01

Applicability **** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~ACTION STATEMENTS~~

~~ACTION 22 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.~~

Add proposed ACTIONS A and B

M02

ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 24 - DELETED

ACTION A

ACTION 25 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION 26 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

ACTION 27 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s), and

2) Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 3.3.9

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.3.3.1 specify requirements for radiation monitoring instrumentation and list the requirements for each functional unit in CTS Table 3.3-6, including the Fuel Pool Storage Area Monitor instrumentation. ITS 3.3.8 provides requirements for the fuel pool area radiation instrumentation and provides the requirements in the LCO, Applicability, ACTIONS, and Surveillance Requirements. This changes the CTS by presenting the instrument requirements without use of an instrument table. This change is acceptable as it results solely from the change in the format and presentation of the CTS necessary to conform to the ISTS. This change is designated as administrative and is acceptable because it is the result of changes in the format and presentation of the CTS requirements and does not result in a technical change to the CTS.

A03 CTS 3.3.3.1 Action c states that the provisions of Specification 3.0.3 are not applicable. CTS 3.0.3 (ITS LCO 3.0.3) does not apply in MODES 5 and 6, which encompasses the condition of during movement of recently irradiated fuel assemblies. This changes the CTS by eliminating an action requirement that is redundant to other Technical Specification requirements.

The purpose of CTS 3.3.3.1 Action c is to preclude action be taken per Specification 3.0.3 (ITS LCO 3.0.3) to shutdown the unit in the event there are no actions to perform or the actions cannot be performed within the required time when the fuel pool area radiation monitoring instrumentation is inoperable. The ITS Applicability is changed to “During movement of recently irradiated fuel assemblies in the spent fuel storage pool (Refer to Discussion of Change L01). CTS 3.0.3 (ITS LCO 3.0.3) is not applicable while in MODE 5 or 6. Recently irradiated fuel is defined as fuel that has occupied part of a critical reactor core within the previous 72 hours. To access the fuel to begin movement of recently irradiated fuel requires the unit to be in MODE 6. Therefore, the only time recently irradiated fuel can possibly be moved in the spent fuel storage pool is following entry into MODE 6 and only up to 72 hours after reaching subcritical conditions. Since LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4, stating that the provisions of Specification 3.0.3 are not applicable is redundant and unnecessary. This change is designated as administrative and is acceptable because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. Upon declaring the channel inoperable, CTS Table 3.3-6, Action 13 (Unit 1) and Action 22 (Unit 2) require area surveys of the monitored area to be performed with portable monitoring instrumentation at least one every 24 hours. ITS 3.3.8 requires the channel to be declared inoperable immediately when the alarm (Unit 1) / actuation (Unit 2) setting exceeds the setpoint specified in SR 3.3.8.3 and associated actions must be performed. This changes the CTS by deleting the 4 hour allowance to declare a channel inoperable and requiring the channel to be declared inoperable immediately upon discovery that the channel is outside the required trip/alarm setpoint value.

The purpose of CTS 3.3.3.1 Action a is to provide a short time period to restore an inoperable channel prior to requiring additional action. CTS 3.3.3.1 Action a allows the alarm/trip setpoint of Table 3.3-6 to exceed the setpoint for 4 hours and then to declare the channel inoperable. When LCO 3.3.8 is not met (i.e., SR 3.3.8.3 not met), LCO 3.0.2 requires the associated ACTIONS to be entered with no delay. For Unit 2, each radiation channel provides input to the associated fuel pool area high radiation instrument train which actuates the associated Shield Building Ventilation System (SBVS) train. Therefore, the ITS action is considered appropriate. This change is designated as more restrictive because the Completion Time to declare the required fuel pool area radiation instrument channels inoperable following discovery of an associated channel exceeding it associated trip setpoint has been reduced.

M02 CTS 3.3.3.1 Action b requires, when one or more radiation monitoring channels are inoperable, to take the ACTION shown in Table 3.3-6. Thus, when the Unit 1 Fuel Storage Pool Area monitor channel is inoperable CTS Table 3.3-6, Action 13 requires area surveys of the monitored area to be performed with portable monitoring instrumentation at least once every 24 hours. When one or more Unit 2 Fuel Storage Pool Area Criticality and Ventilation System Isolation Monitor channels are inoperable CTS Table 3.3-6, Action 22 also requires area surveys of the monitored area to be performed with portable monitoring instrumentation at least once every 24 hours. Unit 1 ITS 3.3.8 ACTIONS require, when the required fuel pool area high radiation monitoring channel is inoperable, immediate suspension of movement of recently irradiated fuel assemblies within the spent fuel storage pool. Unit 2 ITS 3.3.8 ACTION A requires, with one fuel pool area high radiation instrument train inoperable, the associated fuel pool area high radiation instrument train to be restored to OPERABLE status within 7 days. With two fuel pool area high radiation instrument trains inoperable or if one inoperable instrument train cannot be restored within 7 days, Unit 2 ITS 3.3.8 ACTION B requires immediate suspension of recently irradiated fuel assemblies within the spent fuel storage pool (i.e., exit the Applicability). This changes the CTS actions by replacing the requirement to perform radiation surveys every 24 hours with portable monitoring instrumentation with actions to restore the instrumentation to OPERABLE status (Unit 2) or exit the Applicability (Unit 1 and Unit 2).

The purpose of the CTS 3.3.3.1 requirements is to ensure radiation instrumentation required to actuate safety related systems are OPERABLE. The fuel storage pool area monitoring instrumentation for Unit 1 is provided to monitor radiation levels in the fuel pool area to alert the operator of the need to filter airborne radioactive particulate following a fuel handling accident (FHA). On a Unit 1 high fuel pool area radiation signal, the Fuel Pool Area Ventilation System is manually started and aligned to exhaust the spent fuel storage pool area through the Fuel Pool Area Ventilation System filtration unit, if the alarm is due to an FHA. The fuel storage pool area monitoring instrumentation for Unit 2 is provided to actuate the SBVS and aligns the system to the area of the spent fuel storage pool to filter airborne radioactive particulate following an FHA. On a Unit 2 high fuel pool area radiation signal, the SBVS automatically starts and aligns to exhaust the spent fuel storage pool area through the SBVS filtration units.

10 CFR 50.36(c)(2)(i) requires, in part, when LCO is not met, the licensee to shut down the reactor or follow any remedial action permitted by the Technical Specifications until the condition can be met. Although the CTS action to perform area surveys of the monitored area with portable monitoring instrumentation at least once every 24 hours does provide compensatory actions for monitoring radiation levels during normal operation, the action requirement does not provide an appropriate remedial action necessary to place the plant in a safe condition with required monitoring instrumentation inoperable that is necessary to support the mitigation of an FHA in the spent fuel storage pool. Unit 1 ITS 3.3.8 ACTION A is acceptable because the action places the unit in a condition in which the LCO does not apply (i.e., immediately suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool). This does not preclude the movement of fuel to a safe position. Unit 2 ITS 3.3.8 ACTION A is acceptable because when one fuel pool area high radiation instrument train is inoperable (e.g., one or two required fuel pool area high radiation channels are inoperable or an actuation logic relay is inoperable), the inoperable instrument train must be restored to OPERABLE status within 7 days. The remaining OPERABLE instrument train in this degraded condition is capable of actuating one SBVS train following an FHA. The Completion Time is consistent with the Completion Time to restore one inoperable SBVS train to OPERABLE status in the ACTIONS of Specification 3.6.9, “Shield Building Ventilation System (SBVS),” and is based on consideration of such factors as the availability of the OPERABLE redundant instrument train and the low probability of an FHA occurring during this period. Unit 2 ITS 3.3.8 ACTION B is acceptable because, when one fuel pool area high radiation instrument train cannot be restored to OPERABLE status within 7 days or when two fuel pool area high radiation instrument trains are inoperable during movement of recently irradiated fuel assemblies, the action places the unit in a condition in which the LCO does not apply (i.e., immediately suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool). This does not preclude the movement of fuel to a safe position. This change is designated as more restrictive because the current actions that allow operation to continue for an unlimited period of time with the inoperable radiation monitoring instrumentation have been replaced with actions that limit the time operation in the specified condition can continue with the inoperable instrumentation.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 - Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6 for radiation monitoring instrumentation has a column specifying the Measurement Range and a specific measurement range for the fuel storage pool area instrumentation. ITS 3.3.8 does not retain the "MEASUREMENT RANGE" column or the specific measurement range of the fuel pool area high radiation instrumentation. This changes the CTS by moving the instrument measurement range to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 (*Category 2 – Relaxation of Applicability*) CTS 3.3.1 requires the radiation monitoring instrumentation channels shown in Table 3.3-6 to be OPERABLE, which includes the Unit 1 Fuel Storage Pool Area Monitors (Instrument 1.a) and the Unit 2 Fuel Storage Pool Area Criticality and Ventilation System Isolation Monitors (Instrument 1.a.i). Footnote * specifies the Applicability for Unit 1 Instrument 1.a and Unit 2 Instrument 1.a.i and states," With fuel in the storage pool or building." The ITS 3.3.8 Applicability requires the instrumentation to be OPERABLE, "During movement of recently irradiated fuel assemblies in the spent fuel storage pool." This changes the CTS by relaxing the Applicability of the Fuel Storage Pool Area Monitors to only when there is a potential for a fuel handling accident (FHA) involving recently irradiated fuel, that is, during the movement of recently irradiated fuel assemblies in the spent fuel storage pool.

The purpose of the area radiation monitoring instrumentation is to ensure that the Fuel Pool Ventilation System (Unit 1) or SBVS (Unit 2) can provide filtration to minimize the consequences of an FHA involving recently irradiated fuel (i.e., an irradiated fuel assembly that has occupied part of a critical reactor core within the previous 72 hours). This change is acceptable because the requirements continue to ensure that the structures, systems, and components are maintained in the specified conditions needed to minimize event consequences during an

FHA involving recently irradiated fuel. The FHA analysis assumes movement of an irradiated fuel assembly that has not occupied part of a critical reactor core within the previous 72 hours. It is improbable to move irradiated fuel within 72 hours of a plant shutdown (i.e., keff < 0.99) because of the physical time required to perform a controlled plant shutdown, cooldown and depressurize the Reactor Coolant System (RCS), and disassemble the reactor vessel to access irradiated fuel to begin fuel movement. Additionally, filtration of the fuel handling building is not assumed for an FHA in the spent fuel storage pool. The ITS requires OPERABLE fuel pool area high radiation instrumentation to ensure that, in the unlikely event an FHA in the spent fuel storage pool occurs within 72 hours of a unit shutdown, fuel pool area ventilation and filtration are provided to minimize the consequences of this improbable event. This change is designated as less restrictive because the LCO requirements are applicable in fewer conditions than in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.3 INSTRUMENTATION ~~(Analog)~~ 1 3

3.3.~~10~~ 8 ~~Shield Building Filtration Actuation Signal (SBFAS) (Analog)~~ Fuel Pool Area Radiation Instrumentation 3

3.3.3.1 Table 3.3-6 Function 1.a

LCO 3.3.~~10~~ 8 ~~Two channels of SBFAS automatic and two channels of Manual Trip~~ One fuel pool area high radiation monitoring channel shall be OPERABLE. 3 1

Applicability APPLICABILITY: ~~MODES 1, 2, 3, and 4~~ During movement of recently irradiated fuel assemblies in the spent fuel storage pool. 1

ACTIONS

Action b. DOC M02

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~Manual Trip or Actuation Logic~~ required channel inoperable.	A.1 ~~Restore the channel to OPERABLE status.~~ Suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool.	~~48 hours~~ Immediately
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~ ~~AND~~ ~~B.2 ---NOTE--- LCO 3.0.4.a is not applicable when entering MODE 4. ---~~ ~~Be in MODE 4~~.	~~6 hours~~ ~~12 hours~~

1 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.3.3.1	SR 3.3.~~10~~.1 8	Perform a CHANNEL CHECK ~~FUNCTIONAL TEST~~ on ~~each SBFAS automatic actuation~~ required fuel pool area high radiation monitoring channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
4.3.3.1	SR 3.3.~~10~~.2 8	Perform a CHANNEL FUNCTIONAL TEST on ~~each SBFAS Manual Trip~~ required fuel pool area high radiation monitoring channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2

Insert 1 1

1

INSERT 1

4.3.3.1	SR 3.3.8.3	Perform a CHANNEL CALIBRATION on required fuel pool area high radiation monitoring channel. Verify alarm setting is less than or equal to the setpoint of 15 mR/hr.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION ~~(Analog)~~ 1 3

3.3.~~10~~ Fuel Pool Area Radiation Instrumentation ~~Shield Building Filtration Actuation Signal (SBFAS) (Analog)~~ 3
8

3.3.3.1 Table 3.3-6 Function 1.a

LCO 3.3.~~10~~ 8 Two fuel pool area high radiation instrument trains ~~channels of SBFAS automatic and two channels of Manual Trip~~ shall be OPERABLE. 3 1

Applicability APPLICABILITY: ~~MODES 1, 2, 3, and 4~~ During movement of recently irradiated fuel assemblies in the spent fuel storage pool. 1

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action b. DOC M02	A. One instrument train ~~Manual Trip or Actuation Logic channel~~ inoperable.	A.1 Restore instrument train ~~the channel~~ to OPERABLE status.	~~48 hours~~ 7 days	1
Table 3.3-6 Function 1.a DOC M02	B. Required Action and associated Completion Time not met. OR Two instrument trains inoperable.	B.1 ~~Be in MODE 3.~~ Suspend movement of recently irradiated fuel assemblies in the spent fuel storage pool. ~~AND~~ ~~B.2 -------NOTE------- LCO 3.0.4.a is not applicable when entering MODE 4. ------------~~ ~~Be in MODE 4~~.	~~6 hours~~ Immediately ~~12 hours~~	1 1 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.3.3.1	SR 3.3.~~10~~.1 (8) Perform a CHANNEL CHECK ~~FUNCTIONAL TEST~~ on each required fuel pool area high radiation ~~SBFAS automatic actuation~~ channel.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2
4.3.3.1	SR 3.3.~~10~~. 2 (8) Perform a CHANNEL FUNCTIONAL TEST on each fuel pool area instrument logic train ~~SBFAS Manual Trip channel~~.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 1 2

Insert 1

1

1

INSERT 1

4.3.3.1	SR 3.3.8.3	Perform a CHANNEL CALIBRATION on each fuel pool area high radiation instrument train. Verify actuation setting is less than or equal to the setpoint of 20 mR/hr.	In accordance with the Surveillance Frequency Control Program

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.8, FUEL POOL AREA RADIATION INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.10 to 3.3.8 and “(Analog)” is deleted from the title.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~10~~ 8 ~~Shield Building Filtration Actuation Signal (SBFAS) (Analog)~~ Fuel Pool Area Radiation Instrumentation 3 1

BASES

BACKGROUND	This LCO encompasses the ~~SBFAS, which is a plant specific instrumentation system that performs an actuation Function required for plant protection but is not otherwise included in LCO 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCOs 3.3.5 and 3.3.6. Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements that are applicable to them.~~ Insert 1 1
APPLICABLE SAFETY ANALYSES	The ~~SBFAS~~ fuel pool area radiation instrumentation is required to ~~filter~~ monitor the ~~air space between the containment and shield building during a loss of coolant accident (LOCA), as discussed in FSAR, Chapter 15 (Ref. 1)~~ Insert 2. 1 The ~~SBFAS~~ fuel pool area radiation instrumentation satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1
LCO	The LCO on equipment OPERABILITY ensures that the ~~SBFAS~~ fuel pool area radiation instrumentation will perform as required when called upon. 1 The LCO requires ~~two channels of SBFAS automatic and Manual Trip~~ one fuel pool area high radiation monitoring channel to be OPERABLE. ~~Two channels are necessary to ensure the required redundancy should one channel become inoperable~~ Insert 3. 1
APPLICABILITY	~~The SBFAS must be OPERABLE in MODES 1, 2, 3, and 4, since the possibility of a LOCA is greatest in these MODES. In MODE 5 or 6 the probability of a LOCA is greatly diminished, and there is ample time to respond manually to a LOCA event.~~ Insert 4 1
ACTIONS	~~When the number of inoperable channels in a trip Function exceeds those specified in the Conditions associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.~~ 1

1 **INSERT 1**

fuel pool area radiation instrumentation which monitors radiation levels in the fuel pool area to alert the operator of the need to filter airborne radioactive particulate following a fuel handling accident (FHA). The Fuel Pool Area Ventilation System requirements are specified in LCO 3.7.17, "Fuel Pool Area Ventilation System." On a high fuel pool area radiation signal, the Fuel Pool Area Ventilation System is manually started and aligned to exhaust the spent fuel storage pool area through the Fuel Pool Area Ventilation System filtration unit if the alarm is due to an FHA. In this alignment, the system achieves and maintains a negative air pressure in the fuel handling building. Two channels of fuel pool area high radiation instrumentation, with a sensing range of 1 to 1000 mR/hr, are provided to monitor the fuel pool area.

1 **INSERT 2**

spent fuel storage pool area during an FHA involving recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours). The analysis of the FHA is given in Reference 1

The FHA analysis assumes movement of an irradiated fuel assembly that has not occupied part of a critical reactor core within the previous 72 hours. Additionally, filtration of the fuel handling building is not assumed for an FHA in the spent fuel storage pool. The Technical Requirements Manual includes a decay time requirement that no fuel movement will commence until 72 hours after shutdown. This ensures that the FHA assumptions, including no filtration of the fuel handling building, are preserved. In the event an FHA in the spent fuel storage pool occurs within 72 hours of a unit shutdown, actuation of the Fuel Pool Area Ventilation System when high radiation is indicated in the fuel pool area high will provide filtration to minimize the consequences of this improbable event.

1 **INSERT 3**

Since the Fuel Pool Area Ventilation System consists of a common filtration unit and is a manually actuated system, only one channel of the fuel pool area radiation monitoring instrumentation is required to be OPERABLE.

1

INSERT 4

During movement of recently irradiated fuel assemblies in the spent fuel storage pool, the fuel pool area ventilation high radiation instrumentation is required to be OPERABLE to support the Fuel Pool Area Ventilation System. Due to radioactive decay associated with irradiated fuel assemblies in the spent fuel storage pool, the Fuel Pool Area Ventilation System is only required to mitigate FHAs that involve handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours).

When movement of irradiated fuel assemblies within the spent fuel storage pool is not being conducted, the potential for an FHA within the fuel pool area does not exist. Additionally, due to radioactive decay, an FHA that involves handling non-recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core longer than 72 hours) will result in doses that are well within the guideline values specified in 10 CFR 50.67 even without fuel pool area ventilation filtration capability. Therefore, under these conditions the Fuel Pool Area Ventilation System, including the associated high radiation monitoring instrumentation, is not required to be OPERABLE.

BASES

ACTIONS (continued)

A.1

Insert 5

~~Condition A applies to the failure of one SBFAS Manual Trip channel or of one Actuation Logic associated with the Chemical and Volume Control System Isolation Signal or SBFAS. Required Action A.1 requires restoration of the inoperable channel to restore redundancy of the affected Function. The Completion Time of 48 hours is consistent with the Completion Time of other ESFAS Functions employing similar logic and should be adequate for most repairs while minimizing the risk of operating with an inoperable channel for a manually actuated Function.~~ 1

~~B.1 and B.2~~

~~REVIEWER'S NOTE~~

~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

1. ~~[LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~ 2

2. ~~[LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~ 2

~~Condition B specifies the shutdown track to be followed if the Required Action and associated Completion Time of Condition A are not met. If Required Action A.1 cannot be met within the required Completion Time, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. Inoperability of the SBFAS has no effect on plant core damage frequency in any operational MODE.~~ 1

~~Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 2). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.~~ 1

1

INSERT 5

When the required fuel pool area ventilation high radiation monitoring channel is inoperable during movement of recently irradiated fuel assemblies, action must be taken to place the unit in a condition in which the LCO does not apply. This involves immediately suspending movement of recently irradiated fuel assemblies in the spent fuel storage pool. This does not preclude the movement of fuel to a safe position.

BASES

ACTIONS (continued)

~~Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.~~

~~The Completion Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.~~

SURVEILLANCE REQUIREMENTS

SR 3.3.~~10~~8.1

Insert 6

~~The SBFAS can be initiated either on a Safety Injection Actuation Signal (SIAS) or manually. This Surveillance is a restatement of SR 3.3.5.1 on the SIAS Function. Performing SR 3.3.5.1 satisfies this Surveillance. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. [The Frequency is the same as that for SR 3.3.5.1.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-------------------- REVIEWER'S NOTE --------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

.

1

INSERT 6

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when Surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.~~10~~.2 8

A CHANNEL FUNCTIONAL TEST is performed on the ~~manual SBFAS~~ fuel pool area high radiation instrumentation actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions~~. 3 1 1

Insert 7 ~~This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the Function. [The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months~~ 1 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-------------------REVIEWER'S NOTE-------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~ 1

Insert 8

REFERENCES

1. U FSAR, Chapter ~~[~~15~~]~~. 1

~~2. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.~~ UFSAR, Section 7.3 1

1

INSERT 7

The CHANNEL FUNCTIONAL TEST tests the individual sensor subsystems using an analog test input to each bistable. A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified tolerance around the setpoint. Any setpoint adjustment shall be consistent with the assumptions of the plant specific setpoint analysis.

1

INSERT 8

SR 3.3.8.3 CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the extension analysis. The requirements for this review are outlined in Reference 2.

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~10~~ ~~Shield Building Filtration Actuation Signal (SBFAS) (Analog)~~ 8 Fuel Pool Area Radiation Instrumentation

BASES

BACKGROUND

Insert 1

This LCO encompasses the ~~SBFAS, which is a plant specific instrumentation system that performs an actuation Function required for plant protection but is not otherwise included in LCO 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCOs 3.3.5 and 3.3.6. Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements that are applicable to them.~~ 1

APPLICABLE SAFETY ANALYSES

fuel pool area radiation instrumentation

The ~~SBFAS~~ is required to monitor ~~filter~~ the ~~air space between the containment and shield building during a loss of coolant accident (LOCA), as discussed in FSAR, Chapter 15 (Ref. 1)~~. Insert 2 1

The ~~SBFAS~~ satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1

LCO

fuel pool area high radiation instrument logic trains

The LCO on equipment OPERABILITY ensures that the ~~SBFAS~~ fuel pool area radiation instrumentation will perform as required when called upon. 1

Insert 3

The LCO requires two ~~channels of SBFAS automatic and Manual Trip~~ to be OPERABLE. ~~Two channels are necessary to ensure the required redundancy should one channel become inoperable~~. 1

APPLICABILITY

Insert 4

~~The SBFAS must be OPERABLE in MODES 1, 2, 3, and 4, since the possibility of a LOCA is greatest in these MODES. In MODE 5 or 6 the probability of a LOCA is greatly diminished, and there is ample time to respond manually to a LOCA event.~~ 1

ACTIONS

~~When the number of inoperable channels in a trip Function exceeds those specified in the Conditions associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.~~ 1

1

INSERT 1

fuel pool area radiation instrumentation which actuates the Shield Building Ventilation System (SBVS) and aligns the system to the area of the spent fuel storage pool to filter airborne radioactive particulate following a fuel handling accident (FHA). The SBVS requirements are specified in LCO 3.6.9, “Shield Building Ventilation System (SBVS).” On a high fuel pool area radiation signal, the SBVS starts and aligns to exhaust the spent fuel storage pool area through the SBVS filtration units. In this alignment, the system achieves and maintains a negative air pressure in the fuel handling building. Six channels of fuel pool area high radiation instrumentation, with a sensing range of 1 to 1000 mR/hr, are provided to the fuel pool area instrument logic. The fuel pool area instrument logic includes two independent, redundant actuation logic trains arranged in a two-out-of-three coincidence with input from the fuel pool area high radiation channels; three channels per train. Each SBVS train is actuated by its associated fuel pool area instrument logic train. The instrumentation requirements associated with other SBVS actuations are included in LCO 3.3.3, “Engineered Safety Features Actuation System (ESFAS) Instrumentation,” and LCO 3.3.4, “Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip.”

1

INSERT 2

spent fuel storage pool area during an FHA involving recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours). The analysis of the FHA is given in Reference 1

The FHA analysis assumes movement of an irradiated fuel assembly that has not occupied part of a critical reactor core within the previous 72 hours. Additionally, filtration of the fuel handling building is not assumed for an FHA in the spent fuel storage pool. The Technical Requirements Manual includes a decay time requirement that no fuel movement will commence until 72 hours after shutdown. This ensures that the FHA assumptions, including no filtration of the fuel handling building, are preserved. In the event an FHA in the spent fuel storage pool occurs within 72 hours of a unit shutdown, automatic actuation of the SBVS on fuel pool area high radiation will provide filtration to minimize the consequences of this improbable event.

1

INSERT 3

For the purpose of this LCO, each instrument logic train consists of at least two fuel pool area high radiation channels, associated actuation logic and relays necessary to actuate the associated SBVS train and valves.

1 **INSERT 4**

During movement of recently irradiated fuel assemblies in the spent fuel storage pool, the fuel pool area ventilation high radiation instrumentation is required to be OPERABLE to support the fuel pool area ventilation mode of the SBVS. Due to radioactive decay associated with irradiated fuel assemblies in the spent fuel storage pool, the SBVS is only required to mitigate FHAs that involve handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours).

When movement of irradiated fuel assemblies within the spent fuel storage pool is not being conducted, the potential for an FHA within the fuel pool area does not exist. Additionally, due to radioactive decay, an FHA that involves handling non-recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core longer than 72 hours) will result in doses that are well within the guideline values specified in 10 CFR 50.67 even without fuel pool area ventilation filtration capability. Therefore, under these conditions the fuel pool area ventilation mode of the SBVS, including the associated high radiation instrumentation, is not required to be OPERABLE.

BASES

ACTIONS (continued)

A.1

Insert 5 ~~Condition A applies to the failure of one SBFAS Manual Trip channel or of one Actuation Logic associated with the Chemical and Volume Control System Isolation Signal or SBFAS. Required Action A.1 requires restoration of the inoperable channel to restore redundancy of the affected Function. The Completion Time of 48 hours is consistent with the Completion Time of other ESFAS Functions employing similar logic and should be adequate for most repairs while minimizing the risk of operating with an inoperable channel for a manually actuated Function.~~ 1

~~B.1 and B.2~~

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

1. ~~[LICENSEE] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~ 2

2. ~~[LICENSEE] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~ 2

~~--~~

~~Condition B specifies the shutdown track to be followed if the Required Action and associated Completion Time of Condition A are not met. If Required Action A.1 cannot be met within the required Completion Time, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. Inoperability of the SBFAS has no effect on plant core damage frequency in any operational MODE.~~ 1

~~Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 2). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state.~~ 1

1

INSERT 5

When one fuel pool area high radiation instrument train is inoperable (e.g., one or two required fuel pool area high radiation channels are inoperable or an actuation logic relay is inoperable), the inoperable instrument train must be restored to OPERABLE status within 7 days. The remaining OPERABLE instrument train in this degraded condition is capable of actuating one SBVS train following an FHA. The Completion Time is consistent with the Completion Time to restore one inoperable SBVS train to OPERABLE status in the ACTIONS of Specification 3.6.9 and is based on consideration of such factors as the availability of the OPERABLE redundant instrument train and the low probability of an FHA occurring during this period.

B.1

When Required Action A.1 is not met within the required Completion Time or when two fuel pool area high radiation instrument trains are inoperable during movement of recently irradiated fuel assemblies, action must be taken to place the unit in a condition in which the LCO does not apply. This involves immediately suspending movement of recently irradiated fuel assemblies in the spent fuel storage pool. This does not preclude the movement of fuel to a safe position.

BASES

ACTIONS (continued)

~~Required Action B.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.~~ 1

~~The Completion Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.~~ 1

SURVEILLANCE REQUIREMENTS

SR 3.3.~~10~~.1 8 3

Insert 6

~~The SBFAS can be initiated either on a Safety Injection Actuation Signal (SIAS) or manually. This Surveillance is a restatement of SR 3.3.5.1 on the SIAS Function. Performing SR 3.3.5.1 satisfies this Surveillance. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. [The Frequency is the same as that for SR 3.3.5.1.~~ 1 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~---]~~

.

1 **INSERT 6**

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when Surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.~~10~~.2 8

A CHANNEL FUNCTIONAL TEST is performed on the ~~manual SBFAS~~ fuel pool area high radiation instrumentation actuation circuitry. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. ~~This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions~~. 3 1 1

Insert 7 ~~This Surveillance verifies that the trip push buttons are capable of opening contacts in the Actuation Logic as designed, de-energizing the initiation relays and providing Manual Trip of the Function. [The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at a Frequency of once every [18] months~~ 1 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 2
~~-----]~~ 1

Insert 8

REFERENCES

1. U FSAR, Chapter ~~[~~15~~]~~. 1

~~2. CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.~~ UFSAR, Section 7.3 1

1

INSERT 7

The CHANNEL FUNCTIONAL TEST tests the individual sensor subsystems using an analog test input to each bistable. A test signal is superimposed on the input in one channel at a time to verify that the bistable trips within the specified tolerance around the setpoint. Any setpoint adjustment shall be consistent with the assumptions of the plant specific setpoint analysis.

1

INSERT 8

SR 3.3.8.3 CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.

The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the extension analysis. The requirements for this review are outlined in Reference 2.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.8, BASES, FUEL POOL AREA RADIATION INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.10 to 3.3.8 and "(Analog)" is deleted from the title.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.8, FUEL POOL AREA RADIATION INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 9

3.3.9, Post Accident Monitoring (PAM) Instrumentation

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

INSTRUMENTATION

POST (PAM)

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

PAM for each Function .9-1

LCO 3.3.9 3.3.3.8 The ~~accident monitoring~~ instrumentation ~~channels shown~~ in Table 3.3-~~11~~ shall be OPERABLE.

Applicability **APPLICABILITY:** MODES 1, 2 and 3.

ACTION:

Add proposed ACTIONS Note

A02

ACTIONS a. Actions per Table 3.3-~~11~~.

.9-1

SURVEILLANCE REQUIREMENTS

Add proposed Surveillance Requirements Note

A03

SR 3.3.9.1
SR 3.3.9.2 4.3.3.8 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations in accordance with the Surveillance Frequency Control Program.

POST

TABLE 3.3~~-11~~ .9-1

ACCIDENT MONITORING INSTRUMENTATION

FUNCTION

REQUIRED

CONDITIONS REFERENCED FROM REQUIRED ACTION D.1

A04

A05

~~INSTRUMENT~~	~~TOTAL NO~~. ~~OF~~ CHANNELS	~~MINIMUM CHANNELS OPERABLE~~	~~ACTION~~	
10 ~~1~~. Pressurizer Water Level	2	~~1~~	~~1, 6~~ E	
~~2. Auxiliary Feedwater Flow Rate~~	~~1/pump~~	~~1/pump~~	~~7~~	R01
~~3. RCS Subcooling Margin Monitor~~	~~2~~	~~1~~	~~1, 6~~	
~~4. PORV Position Indicator Acoustic Flow Monitor~~	~~1/valve~~	~~1/valve~~	~~2~~	
~~5. PORV Block Valve Position Indicator~~	~~1/valve~~	~~1/valve~~	~~2~~	
~~6. Safety Valve Position Indicator~~	~~1/valve~~	~~1/valve~~	~~3~~	
13, 14, 15 and 16 ~~7. Incore thermocouples~~ Core Exit Temperature	~~4/core quadrant~~	~~2/core quadrant~~	~~1, 6~~ E	A06
~~8. Containment Sump Water Level (Narrow Range)~~	~~1*~~	~~1*~~	~~4, 5~~	R01
6 ~~9~~. Containment ~~Sump~~ Water Level (Wide Range)	2	~~1~~	~~4, 5~~ E	M01
5 ~~10~~. Reactor Vessel Level ~~Monitoring System~~	2~~**~~	~~1**~~	~~4, 5~~ F	
7 ~~11~~. Containment Pressure	2	~~1~~	~~1, 6~~ E	

Add proposed Functions 1, 2, 3, 4, 8, 11, 12, and 17

Add proposed footnotes a, b and c

M02 R01 LA01

~~* The non-safety grade containment sump water level instrument may be substituted.~~

~~** Definition of OPERABLE: A channel is composed of eight (8) sensors in a probe, of which four (4) sensors must be OPERABLE.~~

TABLE 3.3-~~11~~ .9-1 (continued)

ACTION STATEMENTS

ACTION A

ACTION 1 - One or more Functions with one Required channel inoperable ~~With the number of OPERABLE channels less than the Total No. of Channels shown in Table 3.3-11, either~~ restore ~~the inoperable~~ required channel~~(s)~~ to OPERABLE status within 30 days ~~or be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours~~.

Add proposed ACTION B

L01

R01

~~ACTION 2 - With position indication inoperable, restore the inoperable indicator to OPERABLE status or close the associated PORV block valve and remove power from its operator within 48 hours or be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours.~~

~~ACTION 3 - With any individual valve position indicator inoperable, obtain quench tank temperature, level and pressure information once per shift to determine valve position.~~

ACTION A

ACTION B

~~ACTION 4 -~~ Required Action and associated Completion Time of Condition A ~~With the number of OPERABLE Channels one less than the Total Number of Channels shown in Table 3.3-11, either~~ restore ~~the inoperable~~ required channel to OPERABLE status within ~~7~~ 30 days ~~if repairs are feasible without shutting down~~ or prepare and submit a Special Report to the Commission pursuant to the specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

L01

LA02

Initiate action in accordance with Specification 5.6.4 immediately

A07

See ITS 5.6

ACTION C

ACTION 5 - One or more Functions with two required channels inoperable ~~With the number of OPERABLE Channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either~~ restore ~~the inoperable~~ one channel~~(s)~~ to OPERABLE status within ~~48 hours~~ 7 days ~~if repairs are feasible without shutting down~~ or:

L02

LA02

ACTION D
ACTION F

1. Initiate an alternate method of monitoring the reactor vessel inventory; and

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status; and

Initiate action in accordance with Specification 5.6.4 immediately

A07

See ITS 5.6

~~3. Restore the Channel to OPERABLE status at the next scheduled refueling~~.

LA02

ACTION C

ACTION 6 - One or more Functions with two required channels inoperable ~~With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either~~ restore ~~the inoperable~~ one channel~~(s)~~ to OPERABLE status within ~~48 hours~~ 7 days or be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours.

ACTION D
ACTION E

L02

~~ACTION 7 - With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 72 hours or be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours.~~

R01

~~DELETED~~

INSTRUMENTATION

POST ACCIDENT

3/4.3.3 MONITORING INSTRUMENTATION

(PAM)

~~RADIATION MONITORING~~

LIMITING CONDITION FOR OPERATION

PAM for each Function .9-1

LCO 3.3.9 3.3.3.1 The ~~radiation monitoring~~ instrumentation ~~channels shown~~ in Table 3.3~~-6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~. L03

APPLICABILITY: ~~As shown in Table 3.3-6.~~ MODES 1, 2, and 3. L04

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ L03

ACTIONS b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3~~-6~~. .9-1

~~c. The provisions of Specification 3.0.3 are not applicable.~~ M03

SURVEILLANCE REQUIREMENTS

accident

SR 3.3.9.1
SR 3.3.9.2 4.3.3.1 Each ~~radiation~~ monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK~~,~~ and CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program. See ITS 3.3.6

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

TABLE 3.3-~~6~~ .9-1

POST ACCIDENT ~~RADIATION~~ MONITORING INSTRUMENTATION

CONDITIONS REFERENCED FROM REQUIRED ACTION D.1

A04

A05

FUNCTION ~~INSTRUMENT~~	REQUIRED ~~MINIMUM~~ CHANNELS ~~OPERABLE~~	APPLICABLE MODES	~~ALARM/TRIP SETPOINT~~	MEASUREMENT RANGE	~~ACTION~~	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area	1	*	≤ 15 mR/hr	10^{-1} – 10^{4} mR/hr	13	See ITS 3.3.8
b. Containment (CIS)	3	****	≤ 90 mR/hr	1 – 10^{5} mR/hr	16	See ITS 3.3.6
9 ~~c.~~ Containment ~~Area – Hi Range~~ Radiation (high range)	2 ~~1~~ M04	1, 2, 3~~, & 4~~ L04	~~≤ 10 R/hr~~ L03	~~1 – 10^{7} R/hr~~ LA04	~~15~~ F	
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	10 - 10^{7} cpm	17	See ITS 3.3.7
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10^{6} cpm	14	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	10 – 10^{6} cpm	14	

* With fuel in the storage pool or building. See ITS 3.3.8

**** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~TABLE NOTATION~~

ACTION 12 - DELETED

ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 14 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

Add proposed ACTIONS A and B

M04

ACTION C

~~ACTION 15 -~~ With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within ~~72 hours~~ 7 days, or:

L02

ACTION D
ACTION F

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s),and

Initiate action in accordance with Specification 5.6.4 immediately

A07

2) Prepare and submit a Special Report to the Commission pursuant to Specification6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 5.6

ACTION 16 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION 17 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

INSTRUMENTATION

~~ACCIDENT~~ POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.9 3.3.3.6 The ~~accident monitoring~~ PAM instrumentation ~~channels shown~~ for each Function in Table 3.3-~~10~~ .9-1 shall be OPERABLE.

Applicability **APPLICABILITY**: MODES 1, 2 and 3.

ACTION: Add proposed ACTIONS Note A02

ACTION A a.~~*~~ One or more Functions with one Required channel inoperable ~~With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-10, either~~ restore ~~the inoperable~~ required channel to OPERABLE status within ~~7~~ 30 days~~, or be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours~~. L01

Add proposed ACTION B

ACTION C b.~~*~~ One or more Functions with two required channels inoperable ~~With the number of OPERABLE accident monitoring channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10, either~~ restore ~~the inoperable~~ one channel~~s~~ to OPERABLE status within ~~48 hours~~ 7 days or L02

ACTION D ACTION E be in HOT STANDBY in 6 hours and HOT SHUTDOWN in 12 hours.

ACTION A c.~~**~~ Required Action and associated Completion Time of Condition A not met, ~~With the number of OPERABLE Channels one less than the Total Number of Channels shown in Table 3.3-10, either~~ restore ~~the inoperable~~ required channel to OPERABLE status within ~~7~~ 30 days ~~if repairs are feasible without shutting down~~ or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status. L01 LA02 A07

ACTION B Initiate action in accordance with Specification 5.6.4 See ITS 5.6

ACTION C d.~~**~~ One or more Functions with two required channels inoperable ~~With the number of OPERABLE Channels less than the Minimum Channels OPERABLE requirements of Table 3.3-10, either~~ restore ~~the inoperable~~ one channel~~(s)~~ to OPERABLE status within ~~48 hours if repairs are feasible without shutting down~~ 7 days or: M01 LA02 L02

ACTION D ACTION F Initiate action in accordance with Specification 5.6.4

1. Initiate an alternate method of monitoring the reactor vessel inventory; and

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status, and

A07 See ITS 5.6

~~3. Restore the Channel to OPERABLE status at the next scheduled refueling.~~ LA02

---

* Action statements do not apply to Reactor Vessel Level Monitoring System, ~~Containment Sump Water Level (narrow range)~~ and Containment Sump Water Level (wide range) instruments.

** Action statements apply only to Reactor Vessel Level Monitoring System, ~~Containment Sump Water Level (narrow range)~~ and Containment Sump Water Level (wide range) instruments.

R01 A01

INSTRUCTIONS

POST (PAM)

ACCIDENT MONITORING INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

Add proposed Surveillance Requirements Note

A03

SR 3.3.9.1
SR 3.3.9.2

4.3.3.6 Each accident monitoring instrumentation channel will be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations in accordance with the Surveillance Frequency Control Program.

.9-1

POST

TABLE 3.3-~~10~~

ACCIDENT MONITORING INSTRUMENTATION

CONDITIONS REFERENCED FROM REQUIRED ACTION D.1

A04

A05

FUNCTION

ITS	~~INSTRUMENT~~	REQUIRED ~~NUMBER OF~~ CHANNELS	~~MINIMUM CHANNELS OPERABLE~~	
7	~~1~~. Containment Pressure	2	~~1~~	
	2. Reactor Coolant ~~Outlet~~ System Hot Leg Temperature ~~– THot (Wide Range)~~	2	~~1~~	
	3. Reactor Coolant ~~Inlet~~ System Cold Leg Temperature ~~– TCold (Wide Range)~~	2	~~1~~	
	4. ~~Reactor Coolant~~ Pressurizer Pressure ~~– Wide Range~~	2	~~1~~	
10	~~5.~~ Pressurizer Water Level	2	~~1~~	
	~~6. Steam Generator Pressure~~	~~2/steam generator~~	~~1/steam generator~~	R01
	~~7. Steam Generator Water Level – Narrow Range~~	~~1/steam generator~~	~~1/steam generator~~	R01
11	8. Steam Generator Water Level – Wide Range	2 ~~1~~/steam generator~~*~~	~~1/steam generator*~~	
	~~9. Refueling Water Tank Water Level~~	~~2~~	~~1~~	R01
	~~10. Auxiliary Feedwater Flow Rate (Each pump)~~	~~1/pump*~~	~~1/pump*~~	R01
	~~11. Reactor Cooling System Subcooling Margin Monitor~~	~~2~~	~~1~~	R01
	~~12. PORV Position/Flow Indicator~~	~~2/valve***~~	~~1/valve**~~	R01
	~~13. PORV Block Valve Position Indicator~~	~~1/valve**~~	~~1/valve**~~	R01
	~~14. Safety Valve Position/Flow Indicator~~	~~1/valve***~~	~~1/valve***~~	R01
	~~15. Containment Sump Water Level (Narrow Range)~~	~~1****~~	~~1****~~	R01
6	~~16.~~ Containment Water Level (Wide Range)	2	~~1~~	
13, 14, 15 and 16	~~1~~7. ~~Incore Thermocouples~~ Core Exit Temperature	~~4/core quadrant~~	~~2/core quadrant~~	A06
5	~~18~~. Reactor Vessel Level ~~Monitoring System~~	2~~*****~~	~~1*****~~	L01

Add proposed Functions 1, 8, 12, and 17

Add proposed footnotes a, b and c

M02

~~* These corresponding instruments may be substituted for each other.~~

~~** Not required if the PORV block valve is shut and power is removed from the operator.~~

~~*** If not available, monitor the quench tank pressure, level and temperature, and each safety valve/PORV discharge piping temperature at least once every 12 hours.~~

~~**** The non-safety grade containment sump water level instrument may be substituted.~~

~~***** Definition of OPERABLE: A channel consists of eight (8) sensors in a probe of which four (4) sensors must be OPERABLE.~~

R01

LA01

~~DELETED~~

INSTRUMENTATION

3/4.3.3 POST ACCIDENT MONITORING INSTRUMENTATION (PAM)

~~RADIATION MONITORING INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.9 3.3.3.1 The PAM ~~radiation monitoring~~ instrumentation for each Function ~~channels shown~~ in Table 3.3-.9-1 ~~6~~ shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~. L03

APPLICABILITY: MODES 1, 2, and 3. ~~As shown in Table 3.3-6.~~ L04

ACTION:

~~a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ L03

ACTIONS b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3 ~~-6~~ .9-1.

~~c. The provisions of Specification 3.0.3 are not applicable.~~ M03

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1
SR 3.3.9.2 4.3.3.1 Each accident ~~radiation~~ monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK~~,~~ and CHANNEL CALIBRATION $\boxed{\text{and CHANNEL FUNCTIONAL TEST}}$ operations in accordance with the Surveillance Frequency Control Program. See ITS 3.3.6

4.3.3.2 In accordance with the Surveillance Frequency Control Program, each Control Room Isolation radiation monitoring instrumentation channel shall be demonstrated OPERABLE by verifying that the response time of the channel is within limits.

See ITS 3.3.7

TABLE 3.3-~~6~~ .9-1

POST ACCIDENT

~~RADIATION~~ MONITORING INSTRUMENTATION

CONDITIONS REFERENCED FROM REQUIRED ACTION D.1

A04

A05

FUNCTION

REQUIRED

~~INSTRUMENT~~	~~MINIMUM~~ CHANNELS ~~OPERABLE~~	APPLICABLE MODES	~~ALARM/TRIP SETPOINT~~	MEASUREMENT RANGE	~~ACTION~~	
~~1. AREA MONITORS~~						
a. Fuel Storage Pool Area						
i. Criticality and Ventilation System Isolation Monitor	4	*	≤ 20 mR/hr	$10^{-1} - 10^{4}$ mR/hr	22	See ITS 3.3.8
b. Containment Isolation	3	****	≤ 90 mR/hr	$1 - 10^{7}$ mR/hr	25	See ITS 3.3.6
9 ~~c.~~ Containment ~~Area – Hi Range~~ Radiation (high range)	2 ~~1~~ M04	1, 2, 3 ~~& 4~~ L04	~~Not Applicable~~	~~$1 - 10^{7}$ R/hr~~ LA04	~~27~~ F	
d. Control Room Isolation	1 per intake	ALL MODES	≤ 320 cpm	$10^{-7} - 10^{-2}$ µCi/cc	26	See ITS 3.3.7
2. PROCESS MONITORS						
a. Containment						
i. Gaseous Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10^{-7} - 10^{-2}$ µCi/cc	23	See ITS 3.4.15
ii. Particulate Activity RCS Leakage Detection	1	1, 2, 3 & 4	Not Applicable	$10 - 10^{7}$ cpm	23	

* With fuel in the storage pool or building. See ITS 3.3.8

**** During movement of recently irradiated fuel assemblies within containment. See ITS 3.3.6

~~TABLE 3.3-6 (Continued)~~

~~ACTION STATEMENTS~~

ACTION 22 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 24 - DELETED

ACTION 25 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9.

See ITS 3.3.6

ACTION 26 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

See ITS 3.3.7

Add proposed ACTIONS A and B

M04

ACTION C

~~ACTION 27 -~~ With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within ~~72 hours~~ 7 days, or:

L02

ACTION D

ACTION F

Initiate action in accordance with Specification 5.6.4 immediately

A07

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s), and

2) Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

See ITS 5.6

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 Unit 1 CTS 3.3.3.8 and Unit 2 CTS 3.3.3.6 Actions provide the compensatory actions to take when PAM instrumentation is inoperable. ITS 3.3.9 ACTIONS provide the compensatory actions for inoperable PAM instrumentation. The ITS 3.3.9 ACTIONS include a Note that allows separate Condition entry for each Function. This changes CTS by providing a specific allowance to enter the Action for each inoperable PAM instrumentation Function.

This change is acceptable because it clearly states the current requirement. The CTS considers each PAM instrumentation Function to be separate and independent from the others. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 Unit 1 CTS 3.3.3.8 and Unit 2 CTS 3.3.3.6 Surveillance Requirements consist of a single surveillance (4.3.3.8 and 4.3.3.6, respectively). CTS Surveillances 4.3.3.8 and 4.3.3.6 state the defined test requirements (Channel Check and Channel Calibration) in accordance with the Surveillance Frequency Control Program. ITS 3.3.9 Surveillance Requirements consist of two separate surveillances SR 3.3.9.1 (Channel Check) and SR 3.3.9.2 (Channel Calibration). A note precedes the ITS surveillances and specifies the applicability of the surveillances to each PAM Function. In addition, ITS SR 3.3.9.2 contains a Note that excludes neutron detectors from the Channel Calibration requirement. Each ITS surveillance is applicable to the PAM Functions (including the newly added Functions) specified in ITS Table 3.3.9-1. This changes CTS by presenting the surveillance requirements in two distinct surveillance requirements and including an exception to the channel calibration requirement for neutron detectors. This change is acceptable as it results solely from the change in the format and presentation of the CTS surveillance requirements necessary to conform to the ITS. Separate change discussions address additional changes where applicable (e.g., addition of functions).

A04 Unit 1 CTS Table 3.3-11 and Unit 1 and 2 Tables 3.3-6 contain a column that specifies the applicable Action(s) for each instrument listed on the Table. The corresponding column in ITS Table 3.3.9-1 specifies the applicable Action Condition referenced from Required Action D.1. Unit 2 CTS 3.3.3.6 addresses Actions within the ACTION section and does not specify Actions for each Instrument (Function) individually in Unit 2 CTS Table 3.3-10. This changes the Unit 1 CTS by replacing the CTS table column specifying the applicable Actions for each PAM instrument with the ITS Table column specifying only the Action referenced from Required Action D.1 for each PAM Function. This changes the

Unit 2 CTS by replacing a table column and adding a table column specifying only the Action referenced from Required Action D.1 for each PAM instrument (Function).

In the ITS, ACTIONS except ACTIONS E and F are common to the PAM Functions listed on Table 3.3.9-1. Therefore, in the ITS, only ACTIONS E and F must be referenced from the Table as applicable for each PAM Function.

The proposed change to the Actions column in the PAM Table is acceptable because it is necessary to conform to the format and presentation of the PAM requirements in the ITS. Technical changes to the CTS Actions are identified and discussed in separate DOCs. The revision of the PAM table Action column does not introduce any additional technical changes and represents a necessary reformat to conform to the ITS. As the proposed change is the result of changes in the format and presentation of the PAM requirements, it is designated administrative.

A05 The title of Unit 1 CTS 3.3.3.8 and Unit 2 CTS 3.3.3.6, “Accident Monitoring Instrumentation,” is revised to “Post Accident Monitoring (PAM) Instrumentation.” The CTS LCO operability requirement and Actions are revised from referencing instrument “channels” to referencing instrument “Functions.” The requirements for each PAM instrument (Function) listed in CTS Table 3.3-11 and CTS Table 3.3.10, respectively are further revised to specify the "Required Channels" for each instrument Function. In addition, the CTS reference to "Minimum Channels Operable" on Table 3.3-11 is deleted. The proposed changes are consistent with the presentation of this information in the corresponding ITS 3.3.9, “Post Accident Monitoring (PAM) Instrumentation.”

The proposed changes are acceptable because they result in a uniform presentation of the PAM requirements without introducing a technical change to the requirements. The use of the term "Function" in the LCO and on ITS Tables 3.3.9-1 merely replaces the term "channel" in the LCO and "Instrument" in CTS Table 3.3-11 and Table 3.3.10 to provide a uniform reference in the ITS. The corresponding proposed ITS Actions reference one or two inoperable channels associated with a PAM Function. As such, the proposed Actions are consistent with the use of the term Function and "Required Channels" used in the ITS to specify the instrument requirements. In addition, the proposed Actions, by addressing two or more inoperable channels (i.e., ITS Action C) effectively replace the CTS need to reference less than the "Minimum Operable Channels" in the Actions. Thus, the CTS "Minimum Operable Channels" column on Table 3.3-11 and Table 3.3.10 is not needed and is deleted. The proposed changes are designated administrative because they represent a change in the format and presentation of the requirements and do not result in a technical change.

A06 The CTS PAM requirement for Core Exit Temperature consists of specifying 4 core exit thermocouples (CETs) per core quadrant. The ITS presents this requirement differently. The corresponding ITS requirement for Core Exit Temperature specifies (2) Required Channels for each core quadrant and lists each quadrant separately. In addition, the ITS requirement for two channels is modified by footnote (c) that requires each channel to contain two CETs. The CTS is revised to conform to the ITS. This changes the CTS by revising the presentation of the Core Exit Temperature Function to be stated in terms of "Required Channels."

The purpose of the PAM TS requirement is to ensure sufficient indication instrumentation is maintained operable to provide the necessary indication in post-accident conditions. The CTS requires (4) CETs per core quadrant. The ITS, by specifying (2) channels per quadrant with each channel consisting of (2) CETs, effectively requires the same number of CETs operable as the CTS. As such, the proposed change is acceptable because it continues to require an adequate number of operable CETs to assure the Core Exit Temperature indication continues to be available for PAM purposes. The proposed change only revises the presentation of this information to be consistent with the ITS. This change in format does not introduce a technical change to the CTS requirements. The proposed change is designated administrative because it does not introduce a technical change to the CTS.

A07 Unit 1 CTS Table 3.3-11 Actions 4 and 5, Unit 2 CTS 3.3.3.6 Actions c and d, and CTS Table 3.3-6 Unit 1 Action 15 and Unit 2 Action 27 require, in part, to prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 and includes detail on what to include in the report and the timing to submit the report. ITS 3.3.9 ACTIONS B and F require a similar action by stating "Initiate action in accordance with Specification 5.6.4," but does not include the detail of what to include in the report or the timing to submit the report. These details are provided in Specification 5.6.4, "Post Accident Monitoring Report." This changes the CTS by moving report detail to another Specification in the ITS.

The purpose of the CTS action is to ensure appropriate level of information is provided to the NRC when submitting a special PAM report. Moving these administrative details to another Specification is acceptable equivalent information in retained in the ITS. Any changes related to the CTS actions moved to ITS Section 5.6 are discussed in the ITS 5.6 Discussion of Changes. This change is a presentation preference and is designated as administrative because it does not result in technical changes to the CTS.

<u>MORE RESTRICTIVE CHANGES</u>

M01 Unit 1 CTS Table 3.3-11, Instrument 9 (Containment Sump Water Level (Wide Range)) specifies Action 5 when less than the Minimum Operable Channels is not met (i.e., both required channels are inoperable). Unit 2 CTS 3.3.3.6, Action d applies to Table 3.3-10, Instrument 16 (Containment Water Level (Wide Range)), as indicated in Footnote **, when the number of OPERABLE channels is less than the Minimum Channels Operable requirements (i.e., both required channels are inoperable). These actions require, in part, to prepare and submit a Special Report to the Commission within 30 days if the instrument cannot be restored to OPERABLE status within 48 hours. For the same Function (ITS Table 3.3.9-1, Function 6), ITS 3.3.9 ACTION E requires the unit to be placed in MODE 3 within 6 hours and MODE 4 within 12 hours if one channel cannot be restored to OPERABLE status within 7 days. This changes the CTS by requiring a plant shutdown instead of preparing and submitting a report to the NRC.

The purpose of the action requirement when at least one channel of Containment Water Level (wide range) cannot be restored to OPERABLE status within the required time is to ensure remedial actions are provided that are acceptable for continued operation or a plant shutdown is required. ISTS 3.3.11 (ITS 3.3.9), ACTION F, which requires initiation of action to prepare and submit a PAM report to the NRC, is applicable to PAM instrument Functions that have alternate means of monitoring developed and tested. This change is necessary because the Containment Water Level (wide range) PAM instrument does not currently have an established alternate means developed and tested to monitor containment sump level during worst case post-accident conditions. Therefore, if at least one Containment Water Level (wide range) channel cannot be restored to OPERABLE status within the required Completion Time when two required channels are inoperable, ACTION E will require placing the unit in MODE 3 in 6 hours and MODE 4 in 12 hours. This change is designated as more restrictive because a plant shutdown is required in ITS that is not required in CTS for a similar condition.

M02 Unit 1 CTS Table 3.3-11 does not require OPERABLE indication channels for Excore Neutron Flux, Reactor Coolant System Hot Leg Temperature, Reactor Coolant System Cold Leg Temperature, Pressurizer Pressure, Penetration Flow Path Containment Isolation Valve Position, Condensate Storage Tank Level and Containment Hydrogen Concentration. These are added to the Unit 1 CTS and shown in ITS Table 3.3.9-1, Functions 1, 2, 3, 4, 8, 11,12, and 17. Unit 2 CTS Table 3.3-10 does not require OPERABLE indication channels for Excore Neutron Flux, Penetration Flow Path Containment Isolation Valve Position, Steam Generator Water Level (Wide Range), Condensate Storage Tank Level and Containment Hydrogen Concentration. These are added to the Unit 2 CTS and shown in ITS Table 3.3.9-1, Functions 1, 8, 12, and 17. Two channels are provided for Excore Neutron Flux (Function 1). Two channels per loop are provided for Reactor Coolant System Hot and Cold Leg Temperature (Functions 2 and 3, respectively). Two channels are provided for Pressurizer Pressure (Function 4). Two channels per penetration flow path are provided for Penetration Flow Path Containment Isolation Valve Position (Function 8). This requirement is modified by two footnotes, footnotes (a) and (b). Footnote (a) does not require position indication for isolation valves whose penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange or check valve with flow through the valve secured. Footnote (b) requires only one position indication channel per penetration flow path with one installed channel located in the control room. One channel per steam generator is provided for Steam Generator Water Level (Wide Range) (Function 11). One channel is provided for Condensate Storage Tank Level (Function 12). Two channels are provided for Containment Hydrogen Concentration (Function 17). ITS 3.3.9 ACTION A has been added to cover the Condition when one or more Functions have one required channel inoperable. ITS 3.3.9 Required Action A.1 allows 30 days to restore the required channel to OPERABLE status. If this Required Action and associated Completion Time of Condition A is not met, then ITS Required Action B.1 requires the immediate initiation of the actions specified in Specification 5.6.4. ITS 3.3.9 ACTION C has been added to cover the Condition when one or more Functions have two required channels inoperable. ITS 3.3.9 Required Action C.1 requires restoration of one channel to OPERABLE status within 7 days. If this cannot be met, then ITS 3.3.9 Condition E must be entered, which will then require entry into Condition F where ITS 3.3.9 Required Action F.1 will require the unit to be in MODE 3 within 6 hours and MODE 4 within 12 hours. A Note has been added to the ACTIONS to allow Separate Condition entry for each Function. In addition, separate Condition entry is allowed within a Function as follows: (a) for Function 8 on a penetration flow path basis and b) for Function 11 on a steam generator basis. In addition, SRs are added for each Function. These SRs are a CHANNEL CHECK for each required instrumentation channel that is normally energized (SR 3.3.9.1) and a CHANNEL CALIBRATION (SR 3.3.9.2). For the CHANNEL CALIBRATION of the Excore Neutron Flux Function channels, SR 3.3.9.2 is modified by a note that states "Neutron detectors are excluded from CHANNEL CALIBRATION." This changes the CTS by adding new Functions, Footnotes, a Note, applicable ACTIONS, and SRs.

This change is acceptable because a plant specific evaluation has concluded that these instrumentation channels are required to provide the primary, unambiguous information to the operator necessary to perform manual actions for which no automatic controls exist and that are required for safety systems to accomplish their safety functions for design basis accident (DBA) events. The change is designated as more restrictive because 8 new instrumentation functions are added to the Unit 1 Technical Specifications and 4 new instrumentation functions are added to the Unit 2 Technical Specifications.

M03 CTS 3.3.3.1 Action c states that the provisions of Specification 3.0.3 are not applicable. ITS 3.3.9 does not include an LCO 3.0.3 exception. This changes the CTS by eliminating the CTS 3.0.3 exception. CTS 3.0.3 requires the unit to be shutdown when the requirements of LCOs and associated Actions are not satisfied. In CTS or ITS, an exception to CTS 3.0.3 (ITS LCO 3.0.3) is not provided to the PAM instrumentation Specification. The containment radiation high range instrumentation is a PAM instrument and is being appropriately moved to the PAM Instrumentation Specification. Eliminating the CTS 3.0.3 exception ensures that the operators are provided guidance regarding actions to take in the event the required PAM instrumentation is inoperable and associated ACTIONS are not satisfied within the required time periods. This change is designated as more restrictive because an explicit exception provided in the CTS is eliminated.

M04 CTS Table 3.3-6 Instrument 1.c (Containment Area – Hi Range), in part, requires one channel to be OPERABLE. ITS Table 3.3.9-1 Function 9 (Containment Radiation (high range)) requires two channels to be OPERABLE. ITS 3.3.9 also includes actions when one of the two Containment Radiation (high range) channels is inoperable. ACTION A requires the inoperable channel to be restored to OPERABLE status within 30 days and ACTION B requires immediately initiating action in accordance with Specification 5.6.4 (i.e., prepare and submit a report to the NRC) if the channel cannot be restored to OPERABLE status within 30 days. This changes the CTS by changing the number of OPERABLE containment radiation high range monitoring channels from one to two and provides ACTIONS when one of two channels is inoperable.

The availability of PAM instrumentation is important so that responses to corrective actions can be observed and the need for, and magnitude of, further actions can be determined. The containment radiation high range instruments are essential PSL identified instruments addressing the recommendations of Regulatory Guide 1.97, as required by Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements." This change is acceptable because the ITS reflects the requirements for diversity and redundancy stated in Regulatory Guide 1.97 and NRC Generic Letter 82-33. This provides the operator an unambiguous source of information for decisions needed following design basis events. The change is designated as a more restrictive because the number of required channels for the containment radiation high range Function is increased from one to two. Remedial actions are provided consistent with actions in the ISTS associated with the inoperability of a redundant channel of other PAM instruments.

RELOCATED SPECIFICATIONS

R01 Unit 1 CTS Table 3.3-11 and Unit 2 CTS Table 3.3-10 provide requirements for Post-Accident Monitoring Instrumentation channels. Each individual post accident monitoring parameter has a specific purpose, however, the general purpose for all accident monitoring instrumentation is to ensure sufficient information is available following an accident to allow an operator to verify the response of automatic safety systems, and to take preplanned manual actions to accomplish a safe shutdown of the plant.

The NRC position on application of the screening criteria to post-accident monitoring instrumentation is documented in a letter dated May 9, 1988 from T.E. Murley (NRC) to the C-E Owners Group. Regulatory Guide (RG) 1.97, Type A variables provide primary information; i.e., information that is essential for the direct accomplishment of the specified manual actions (including long term recovery actions) for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for DBAs or transients. Additionally, it could not be confirmed that RG 1.97, non-Type A Category 1 variables are not of prime importance in limiting risk. Therefore, the NRC position is that the post-accident monitoring instrumentation list should contain Type A instruments and non-Type A Category 1 instruments specified in the plant's safety evaluation report (SER) on RG 1.97. Accordingly, this position has been applied to the PSL Units 1 and 2 RG 1.97 instruments. Those instruments meeting these criteria are retained in the Technical Specifications. The instruments not meeting these criteria will be relocated from the Technical Specifications to the Technical Requirements Manual (TRM).

A review of the PSL Units 1 and 2 UFSAR and the NRC Regulatory Guide 1.97 Safety Evaluation for PSL Units 1 and 2 shows that the following Unit 1 CTS Table 3.3-11 and Unit 2 CTS Table 3.3.10 Instruments do not meet Category 1 or Type A requirements.

Unit 1 CTS Table 3.3-11

Instrument 2 Auxiliary Feedwater Flow Rate

Instrument 3	RCS Subcooling Margin Monitor
Instrument 4	PORV Position Indicator – Acoustic Flow Monitor
Instrument 5	PORV Block Valve Position Indicator
Instrument 6	Safety Valve Position Indicator
Instrument 8	Containment Sump Level

<u>Unit 2 CTS Table 3.3-10</u>

Instrument 6	Steam Generator Pressure
Instrument 7	Steam Generator Water Level – Narrow Range
Instrument 9	Refueling Water Tank Water Level
Instrument 10	Auxiliary Feedwater Flow Rate
Instrument 11	RCS Subcooling Margin Monitor
Instrument 12	PORV Position/Flow Indicator
Instrument 13	PORV Block Valve Position Indicator
Instrument 14	Safety Valve Position/Flow Indicator
Instrument 15	Containment Sump Water Level (Narrow Range)

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. These instruments are not used for, nor capable of, detecting a significant abnormal degradation of the reactor coolant pressure boundary.

2. The monitored parameters are not process variables, design features, or operating restrictions that are initial conditions of a DBA or transient analysis that either assumes the failure of or challenge to the integrity of a fission product barrier.

3. These instruments are not structures, systems, or components that are part of the primary success path or which function or actuate 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. These post-accident monitoring instrument functions are not addressed in the PSL PRA and do not represent a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been satisfied for instruments which do not meet Regulatory Guide 1.97 Type A or non-Type A, Category 1 variable requirements, the requirements for these instruments may be relocated outside the Technical Specifications. The Technical Specification requirements for these instruments will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as a relocation because the requirements for these instruments do not meet the criteria in 10 CFR 50.36(c)(2)(ii) and have been relocated to the TRM.

<u>REMOVED DETAIL CHANGES</u>

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Unit 1 CTS Table 3.3-11, Instrument 10 and Unit 2 CTS Table 3.3-

10, Instrument 18, Reactor Vessel Level Monitoring channel OPERABILITY requirements are modified by Unit 1 footnote ** and Unit 2 footnote ***** that states "Definition of OPERABLE: A channel is composed of eight (8) sensors in a probe, of which four (4) sensors must be OPERABLE." ITS Table 3.3.9-1 Function 5 requires two channels to be OPERABLE but the details of what constitutes an OPERABLE channel are moved to the Bases. This changes the CTS by moving the details of what constitutes an OPERABLE channel to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for two channels of Reactor Vessel Level Indication to be OPERABLE and to perform CHANNEL CHECKS and CHANNEL CALIBRATIONS of the channels and ITS retains the definition of OPERABLE – OPERABILITY in ITS Section 1.1. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5 of the ITS. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 3 - Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Unit 1 CTS 3.3.3.8 Actions 4 and 5 and Unit 2 CTS 3.3.3.6 Actions c and d require restoring the channel to OPERABLE status within 7 days and 48 hours, respectively, “if repairs are feasible without shutting down.” In addition, Unit 1 CTS Action 5 and Unit 2 CTS Action d include the requirement to “Restore the Channel to OPERABLE status at the next scheduled refueling.” ITS SR 3.3.9 ACTIONS do not contain these details. This changes the CTS by removing the unnecessary detail in meeting the Action requirement. (See DOC L02 for additional discussion.)

The removal of these details from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the shutdown requirement as applicable. This change is designated as a less restrictive removal of detail change because operational details for meeting Technical Specifications requirements are being removed from the Technical Specification.

<u>LESS RESTRICTIVE CHANGES</u>

L01 (*Category 3 - Relaxation of Completion Time*) Unit 1 CTS 3.3.3.8 Actions 1 and 4 and Unit 2 CTS 3.3.3.6 Actions a and c address a single inoperable channel in one or more PAM Functions. Unit 1 CTS Action 4 and Unit 2 CTS Action a and c are revised to extend the allowed restoration time of 7 days to 30 days. In addition, the Unit 1 CTS Action 1 and Unit 2 Action a requirement to place the plant in HOT SHUTDOWN (Mode 4) if the affected channel is not restored to operable status is replaced with ITS ACTION B. ITS ACTION B requires that action be "initiated immediately in accordance with Specification 5.6.4." Specification 5.6.4 requires a report to be submitted to the NRC outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status. This changes the CTS by removing the shutdown requirement and allowing continued operation with one inoperable channel provided the reporting requirement is initiated immediately.

The proposed changes are acceptable due to the passive function of the PAM instrumentation (indication only) and the ability to adequately respond to an accident or event using redundant or alternate indications. In addition, the Completion Time extension is justified based on the low likelihood of an event occurring within the allowed Completion Time that would require the affected PAM Function to be Operable. If the channel cannot be restored to Operable status within 30 days, ITS ACTION B requires initiation of action to submit a report to the NRC describing the plan to restore the function to operable status and the alternate method of monitoring during post-accident conditions. The change to submit a report to the NRC in lieu of a plant shutdown is acceptable, because it takes into account the adequacy of indication(s) available to monitor the required parameter. In addition, the proposed ITS Action Condition B requires a report to be issued to advise the NRC of the circumstances and expected duration of the inoperability. The proposed changes are designated less restrictive as they result in additional time being allowed to restore the inoperable PAM instrumentation to operable status.

L02 (*Category 3 - Relaxation of Completion Time*) Unit 1 CTS Table 3.3-11 Actions 5 and 6 and Unit 2 CTS 3.3.3.6 Actions b and d address the condition of instruments with less than the minimum channels operable and requires the inoperable channel(s) to be restored to operable status in 48 hours. Unit 1 CTS Table 3.3-6 Action 15 and Unit 2 CTS Table 3.3-6 Action 27 address, in part, the condition of containment area hi range instrument with less than the minimum channels operable and requires the inoperable channel(s) to be restored to OPERABLE status in 72 hours. The corresponding ITS 3.3.9 Conditions C, D, E and F address one or more Functions with two or more inoperable channels. Required Action C.1 allows 7 days to restore all but one of the inoperable channels (which effectively leaves the inoperability within ITS Action Condition A for a single inoperable channel). Failure to meet Required Action C.1 results in entry into ITS Action Condition D. Required Action D.1 requires entry into the Action Condition referenced on Table 3.3.9-1 for the affected Function.

The significant changes introduced by the new ITS Actions used in place of Unit 1 CTS Table 3.3-11 Actions 5 and 6, Unit 2 CTS 3.3.3.6 Actions b and d, and CTS Table 3.3-6 Unit 1 Action 15 and Unit 2 Action 27 include:

- The extension of the 48 hour restoration time to 7 days (by ITS Action Condition C), and
- The extension of the 72 hour CTS restoration time to 7 days (by ITS Action Condition C).

The proposed change extends the existing limit on operation from 48 hours and 72 hours to 7 days for all instrument Functions. The proposed change is consistent with the industry standard operating limits in the ISTS (i.e., NUREG-1432) for this equipment. The changes are acceptable because they take into consideration the relatively low likelihood of an event that would require the use of the affected PAM Function, the availability of alternate means to obtain the information, and the fact that the indication is passive and does not provide any automatic protective actions. In addition, the proposed change provides additional restoration time that reduces the potential for a unit transient (i.e., reduces risk) introduced by a plant shutdown and restart due solely to inoperable indicating instruments that provide no automatic protective features. These changes are designated less restrictive because additional time is allowed in the ITS to restore channels to OPERABLE status than was allowed in the CTS.

L03 (*Category 1 – Relaxation of LCO Requirements*) CTS 3.3.3.1 and CTS Table 3.3-6, Instrument 1.c provide alarm setpoint requirements for the Containment Area Hi Range instrument. CTS 3.3.3.1 Action a provides actions to take when the Containment Area Hi Range instrument alarm setpoint exceeds the specified value. ITS 3.3.9 does not include alarm setpoint for the Containment Radiation (high range) instrumentation. This changes the CTS by eliminating the alarm setpoint requirements for the Containment Area Hi Range instrument, including the associated actions and alarm setpoint value.

The purpose of the Containment Area Hi Range PAM instrumentation is to provide the control room operator with indication of radiation in the containment to monitor for the potential of significant radiation releases and to provide indication for release assessment used by operators in determining the need to invoke site emergency plans. This change is acceptable because the alarm setpoint is not assumed to acuate in any design basis accident or transient nor required to mitigate any design basis accident or transient. Additionally, the alarm setpoint is not necessary for the Containment Area Hi Range PAM instrumentation to perform its specified function of providing indication to the control room operators. ITS 3.3.9 requires the Containment Radiation (high range) instrumentation to be OPERABLE. The ITS 3.3.9 requirement and the definition of OPERABLE-OPERABILITY are adequate to ensure that the Containment Radiation (high Range) PAM instrumentation remains capable of providing indication to the control room operators. Additionally, this change does not preclude the plant from maintaining an active alarm setpoint to notify operators of high radiation conditions within the containment. This change is consistent with the ISTS and is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L04 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-6 requires the Containment Area Hi Range instrument to be OPERABLE in MODES 1, 2, 3, and 4. ITS 3.3.9 requires the Containment Radiation (high range) PAM Function to be OPERABLE in MODES 1, 2, and 3. This changes the CTS by deleting the requirements for the Function in MODE 4.

The purpose of the Containment Area Hi Range PAM instrumentation is to provide the control room operator with indication of radiation in the containment to monitor for the potential of significant radiation releases and to provide indication for release assessment used by operators in determining the need to invoke site emergency plans. This change is acceptable because the requirements continue to ensure that the instruments are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. The Containment Radiation (high range) PAM instrumentation is required to be OPERABLE in MODES 1, 2, and 3. This is acceptable because in MODES 4, 5, and 6, accidents of the type that would require these instruments are less likely to occur because of reduced temperature and pressure in the RCS and secondary system. This change is consistent with the ISTS and is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~11~~ 9 Post Accident Monitoring (PAM) Instrumentation ~~(Analog)~~ (2)

3.3.3.8
3.3.3.1

LCO 3.3.~~11~~ 9 The PAM instrumentation for each Function in Table 3.3.~~11~~ 9-1 shall be OPERABLE. (2)

Applicability
DOC L04

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

DOC A02

---NOTE---
Separate Condition entry is allowed for each Function.

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Table 3.3-11 Actions 1 & 4 DOC M04	A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	
DOC L01 DOC M04	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.~~5~~ 4.	Immediately	(5)
Table 3.3-11 Actions 5 & 6 Table 3.3-6 Action 15 DOC L02	C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days	
Table 3.3-11 Actions 5 & 6 Table 3.3-6 Action 15 DOC L02	D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.~~11~~ 9-1 for the channel.	Immediately	(2)

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-11 Action 6	E. As required by Required Action D.1 and referenced in Table 3.3.~~11~~ 9-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours
Table 3.3-11 Action 5 Table 3.3-6 Action 15	F. ~~[~~ As required by Required Action D.1 and referenced in Table 3.3.~~11~~ 9-1.	F.1 Initiate action in accordance with Specification 5.6.~~5~~ 4.	Immediately ~~]~~

SURVEILLANCE REQUIREMENTS

DOC A03

-----NOTE-----

These SRs apply to each PAM instrumentation Function in Table 3.3.~~11~~ 9-1.

	SURVEILLANCE	FREQUENCY
4.3.3.8 4.3.3.1	SR 3.3.~~11~~ 9.1 Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
4.3.3.8 4.3.3.1 SR 3.3.~~11~~ 9 .2	------------------------------NOTE--------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	2 ~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 3

CTS

Table 3.3-11

Table 3.3.~~11~~ 9 -1 (page 1 of 1) (2)
Post Accident Monitoring Instrumentation

CTS		FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	
DOC M02	1.	~~[Logarithmic]~~ Excore Neutron Flux (wide range)	2	E	(1)
	2.	Reactor Coolant System Hot Leg Temperature	2 per loop	E	
	3.	Reactor Coolant System Cold Leg Temperature	2 per loop	E	
	4.	~~Reactor Coolant System~~ Pressurizer Pressure ~~(wide range)~~	2	E	(1)
Instrument 10	5.	Reactor Vessel Water Level	2	~~[~~F~~]~~	(3)
Instrument 9 DOC M01	6.	Containment ~~Sump~~ Water Level (wide range)	2	E	(1)
Instrument 11	7.	Containment Pressure (wide range)	2	E	
DOC M02	8.	Penetration Flow Path Containment Isolation Valve Position	2 per penetration flow path[(a)(b)]	E	
Table 3.3-6 Instrument 1.c DOC M04 & L03	9.	Containment ~~Area~~ Radiation (high range)	2	~~[~~F~~]~~	(3) (1)
Instrument 1	10.	Pressurizer Water Level	2	E	
DOC M02	11.	Steam Generator Water Level (wide range)	2 per steam generator	E	
	12.	Condensate Storage Tank Level	2	E	(3)
Instrument 7	13.	Core Exit Temperature - Quadrant ~~[~~1~~]~~	2[(c)]	E	
	14.	Core Exit Temperature - Quadrant ~~[~~2~~]~~	2[(c)]	E	
	15.	Core Exit Temperature - Quadrant ~~[~~3~~]~~	2[(c)]	E	
	16.	Core Exit Temperature - Quadrant ~~[~~4~~]~~	2[(c)]	E	
DOC M02	~~17.~~	~~Auxiliary Feedwater Flow~~ Insert 1	~~2~~	~~E~~	(1)

DOC M02

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) A channel consists of two or more core exit thermocouples.

~~REVIEWER'S NOTE~~
~~Table 3.3.11-1 shall be amended for each unit as necessary to list:~~
~~1. All Regulatory Guide 1.97, Type A instruments and~~
~~2. All Regulatory Guide 1.97, Category I, non-Type A instruments specified in the unit's Regulatory Guide 1.97, Safety Evaluation Report.~~
(4)

1

Insert 1

DOC M01	17.	Containment Hydrogen Concentration	2	E

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~11~~ 9 Post Accident Monitoring (PAM) Instrumentation ~~(Analog)~~ (2)

3.3.3.6
3.3.3.1

LCO 3.3.~~11~~ 9 The PAM instrumentation for each Function in Table 3.3.~~11~~ 9-1 shall be OPERABLE. (2)

Applicability
DOC L04

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

DOC A02

---NOTE---
Separate Condition entry is allowed for each Function.

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Actions a & c DOC M04	A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	
DOC L01 DOC M04	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.~~5~~ 4.	Immediately	(5)
Actions b & d Table 3.3-6 Action 27 DOC L02	C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days	
Actions b & d Table 3.3-6 Action 27 DOC L02	D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.~~11~~ 9-1 for the channel.	Immediately	(2)

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action b	E. As required by Required Action D.1 and referenced in Table 3.3.~~11~~ 9-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours	2
Action d.2 Table 3.3-6 Action 27	F. ~~[~~ As required by Required Action D.1 and referenced in Table 3.3.~~11~~ 9-1.	F.1 Initiate action in accordance with Specification 5.6.~~5~~ 4.	Immediately ~~]~~	3 5 2

SURVEILLANCE REQUIREMENTS

---NOTE---

DOC A03 These SRs apply to each PAM instrumentation Function in Table 3.3.~~11~~ 9-1. 2

	SURVEILLANCE	FREQUENCY	
4.3.3.6 4.3.3.1	SR 3.3.~~11~~ 9.1 Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 3

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
4.3.3.6 4.3.3.1 SR 3.3.~~11~~ 9 .2	-------------------------------NOTE---------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	2 ~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 3

CTS

Table 3.3-10

Table 3.3.~~11~~-1 (page 1 of 1) 9 2
Post Accident Monitoring Instrumentation

CTS		FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	
DOC M02	1.	~~[Logarithmic]~~ Excore Neutron Flux (wide range)	2	E	1
Instrument 2	2.	Reactor Coolant System Hot Leg Temperature	2 per loop	E	
Instrument 3	3.	Reactor Coolant System Cold Leg Temperature	2 per loop	E	
Instrument 4	4.	~~Reactor Coolant System~~ Pressurizer Pressure ~~(wide range)~~	2	E	1
Instrument 18	5.	Reactor Vessel Water Level	2	~~[~~F~~]~~	3
Instrument 16 DOC M01	6.	Containment ~~Sump~~ Water Level (wide range)	2	E	1
Instrument 1	7.	Containment Pressure (wide range)	2	E	
DOC M02	8.	Penetration Flow Path Containment Isolation Valve Position	2 per penetration flow path(a)(b)	E	
Table 3.3-6 Instrument 1.c DOC M04 & L03	9.	Containment ~~Area~~ Radiation (high range)	2	~~[~~F~~]~~	3 1
Instrument 5	10.	Pressurize r Water Level	2	E	
Instrument 8	11.	Steam Generator Water Level (wide range)	2 per steam generator	E	
DOC M02	12.	Condensate Storage Tank Level	2	E	3
Instrument 17	13.	Core Exit Temperature - Quadrant ~~[~~1~~]~~	2(c)	E	3
Instrument 17	14.	Core Exit Temperature - Quadrant ~~[~~2~~]~~	2(c)	E	3
Instrument 17	15.	Core Exit Temperature - Quadrant ~~[~~3~~]~~	2(c)	E	3
Instrument 17	16.	Core Exit Temperature - Quadrant ~~[~~4~~]~~	2(c)	E	3
DOC M02	~~17.~~	~~Auxiliary Feedwater Flow~~ Insert 1	~~2~~	~~E~~	1

DOC M02

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) A channel consists of two or more core exit thermocouples.

~~REVIEWER'S NOTE~~
~~Table 3.3.11-1 shall be amended for each unit as necessary to list:~~
~~1. All Regulatory Guide 1.97, Type A instruments and~~
~~2. All Regulatory Guide 1.97, Category I, non-Type A instruments specified in the unit's Regulatory Guide 1.97, Safety Evaluation Report.~~
4

1

Insert 1

DOC M01	17.	Containment Hydrogen Concentration	2	E

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.9, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.11 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2) and Chemical and Volume Control System (CVCS) Isolation Signal (ISTS 3.3.9). Therefore, ISTS 3.3.2 and ISTS 3.3.9 are not included in the PSL ITS. The successive Specifications are renumbered as necessary.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Changes have been made to reflect change to numbering in ISTS Specification 5.6.5.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~11~~ Post Accident Monitoring (PAM) Instrumentation ~~(Analog)~~

9 2

BASES

BACKGROUND

The primary purpose of the post accident monitoring (PAM) instrumentation is to display plant variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety Functions for Design Basis Events.

The OPERABILITY of the PAM instrumentation ensures that there is sufficient information available on selected plant parameters to monitor and assess plant status and behavior following an accident.

The availability of PAM instrumentation is important so that responses to corrective actions can be observed and the need for, and magnitude of, further actions can be determined. These essential instruments are identified in Reference 1 by ~~plant specific documents (Ref. 1)~~ addressing the recommendations of Regulatory Guide 1.97 (Ref. 2), as required by Supplement 1 to NUREG-0737, "TMI Action Items" (Ref. 3). 1

Type A variables are included in this LCO because they provide the primary information required to permit the control room operator to take specific manually controlled actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety functions for Design Basis Accidents (DBAs). ~~Because the list of Type A variables differs widely between plants, Table 3.3.11-1, in the accompanying LCO, contains no examples of Type A variables, except for those that may also be Category I.~~ 1

Category I variables are the key variables deemed risk significant because they are needed to:

- Determine whether other systems important to safety are performing their intended functions,
- Provide information to the operators that will enable them to determine the potential for causing a gross breach of the barriers to radioactivity release, and
- Provide information regarding the release of radioactive materials to allow for early indication of the need to initiate action necessary to protect the public and for an estimate of the magnitude of any impending threat.

BASES

BACKGROUND (continued)

These key variables are identified by plant specific Regulatory Guide 1.97 analyses (Ref. 1). These analyses identified the plant specific Type A and Category I variables and provided justification for deviating from the NRC proposed list of Category I variables.

~~REVIEWER'S NOTE~~
~~Table 3.3.11-1, in the accompanying LCO, provides a list of variables typical of those identified by plant specific Regulatory Guide 1.97 analyses. Table 3.3.11-1 in the plant specific Technical Specifications shall list all Type A and Category I variables identified by plant specific Regulatory Guide 1.97 analyses, as amended by NRC's Safety Evaluation Report (SER) (Ref. 4). The specific instrument Functions listed in Table 3.3.11-1 are discussed in the LCO Bases.~~

4

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the OPERABILITY of Regulatory Guide 1.97 Type A variables, so that the control room operating staff can:

- Perform the diagnosis specified in the emergency operating procedures. These variables are restricted to preplanned actions for the primary success path of DBAs and
- Take the specified, preplanned, manually controlled actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety functions.

The PAM instrumentation also ensures OPERABILITY of Category I, non-Type A variables. This ensures the control room operating staff can:

- Determine whether systems important to safety are performing their intended functions,
- Determine the potential for causing a gross breach of the barriers to radioactivity release,
- Determine if a gross breach of a barrier has occurred, and
- Initiate action necessary to protect the public as well as to obtain an estimate of the magnitude of any impending threat.

BASES

APPLICABLE SAFETY ANALYSES (continued)

PAM instrumentation that satisfies the definition of Type A in Regulatory Guide 1.97 meets Criterion 3 of 10 CFR 50.36(c)(2)(ii).

Category I, non-Type A PAM instruments are retained in the Specification because they are intended to assist operators in minimizing the consequences of accidents. Therefore, these Category I variables are important in reducing public risk.

LCO

9 LCO 3.3.~~11~~ requires two OPERABLE channels for all but one Function to ensure no single failure prevents the operators from being presented with the information necessary to determine the status of the plant and to bring the plant to, and maintain it in, a safe condition following that accident. 2

Furthermore, provision of two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information.

~~[More than two channels may be required at some units if the Regulatory Guide 1.97 analysis determined that failure of one PAM channel results in information ambiguity (that is, the redundant displays disagree) that could lead operators to defeat or to fail to accomplish a required safety function.]~~ 3

The exception to the two channel requirement is Penetration Flow Path Containment Isolation Valve Position. In this case, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active containment isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE. The applicable CIVs are identified in UFSAR Table 6.2-16. 1

9 Listed below are discussions of the specified instrument Functions listed in Table 3.3.~~11~~-1. ~~These discussions are intended as examples of what should be provided for each Function when the plant specific list is prepared.~~ 2 1

BASES

LCO (continued)

Excore (wide range)

1. ~~[Logarithmic]~~ Neutron Flux

a Type A and Category 1 variable

~~[Logarithmic]~~ Neutron Flux ~~indication~~ is provided to verify reactor shutdown. Excore

~~[At this unit, the [Logarithmic]~~ Neutron Flux PAM channels consist of ~~the following:]~~ Insert 1

1 3

2, 3. Reactor Coolant System (RCS) Hot and Cold Leg Temperature

Type A and

RCS Hot and Cold Leg Temperatures are Category I variables provided for verification of core cooling and long term surveillance.

coolant loop / consists of two channels per reactor coolant loop.

Each channel consists of a resistance temperature detector

Reactor outlet temperature ~~inputs to the PAM are provided by two fast response resistance elements~~ and associated transmitter~~s~~ in each loop. The channels provide indication over a range of ~~32~~ 212°F to 70~~0~~ 5°F. Insert 2

Pressurizer

4. ~~Reactor Coolant System~~ Pressure (wide range)

Pressurizer / Type A and

~~RCS~~ wide range pressure is a Category I variable provided for verification of core cooling and RCS integrity long term surveillance.

Pressurizer

Wide range ~~RCS loop~~ pressure is measured by pressure transmitters with a span of 0 ~~psig~~ to 3000 psi~~g~~ a. The pressure transmitters are located ~~out~~ inside the containment. Redundant monitoring capability is provided by two trains of instrumentation. Control room indications are provided through the ~~inadequate core cooling (ICC) plasma~~ QSPDS display. The ~~ICC plasma~~ display is the primary indication used by the operator during an accident. Therefore, the PAM instrumentation LCO deals specifically with this portion of the instrument channel.

1

Pressurizer

~~In some plants, RCS~~ pressure is a Type A variable because the operator uses this indication to monitor the cooldown of the RCS following a steam generator tube rupture or small break loss of coolant accident (LOCA). Operator actions to maintain a controlled cooldown, such as adjusting steam generator pressure or level, would use this indication. Furthermore, ~~RCS~~ Pressurizer pressure is one factor that may be used in decisions to terminate reactor coolant pump operation.

Insert 1

two channels; each consisting of a fission chamber detector assembly providing continuous independent indication in the Control Room and on the Hot Shutdown Panel. This signal is processed for a wide range of 2 x 10^{-8} to 200% power.

Insert 2

Channel output is provided to the Qualified Safety Parameter Display System (QSPDS) which provides control room indication. Although the temperature range of 212°F to 705°F deviates from RG 1.97 Rev. 3 criteria. For temperatures where RCS temperature is below 350°F the shutdown cooling system would be in operation and hot leg temperatures would be closely represented by the core exit thermocouples which have a range of 32°F to 2300°F and cold leg temperature would be closely represented by the shutdown cooling system temperature element that has a range of 0°F to 400°F, therefore the range of 212°F to 705°F is acceptable (Ref. 4).

BASES

LCO (continued)

5. Reactor Vessel Water Level

Reactor Vessel Water Level is a Category 1 variable provided for verification and long term surveillance of core cooling. 1

The Reactor Vessel Water Level monitoring system provides a direct measurement of the collapsed liquid level above the fuel alignment plate. The collapsed level represents the amount of liquid mass that is in the reactor vessel above the core. Measurement of the collapsed water level is selected because it is a direct indication of the water inventory. The collapsed level is obtained over the same temperature and pressure range as the saturation measurements, thereby encompassing all operating and accident conditions where it must function. Also, it functions during the recovery interval. Therefore, it is designed to survive the high steam temperature that may occur during the preceding core recovery interval.

The level range extends from the top of the vessel down to the top of the fuel alignment plate. The response time is short enough to track the level during small break LOCA events. The resolution is sufficient to show the initial level drop, the key locations near the hot leg elevation, and the lowest levels just above the alignment plate. This provides the operator with adequate indication to track the progression of the accident and to detect the consequences of its mitigating actions or the functionality of automatic equipment. Each channel consists of eight sensors in a probe. A channel is OPERABLE if four sensors, with one sensor in the upper head and three sensors in the upper plenum, are OPERABLE.

6. Containment ~~Sump~~ Water Level (wide range)

Containment ~~Sump~~ Water Level is a Category 1 variable provided for verification and long term surveillance of RCS integrity. 1

~~[For this unit,~~ Containment ~~Sump~~ Water Level instrumentation consists of ~~the following:]~~ Insert 3 3

7. Containment Pressure (wide range)

Containment Pressure is a Category 1 variable provided for verification of RCS and containment OPERABILITY. 1

~~[For this unit,~~ Containment Pressure instrumentation consists of ~~the following:]~~ Insert 4 3

1 3

Insert 3

two channels. Each channel consists of a level transmitter with output to an indicator in the control room. One channel is recorded. The wide range containment level transmitters are located inside containment. The wide range containment water level monitors have a range of -1 ft (bottom of the containment) to elevation 26 feet 1 inch of the containment.

Insert 4 1 3

two channels. Each channel consists of a pressure transmitter mounted outside containment with output to an indicator in the control room. One channel is recorded. The containment wide range pressure monitors have a range of -5 to 175 psig.

BASES

LCO (continued)

8. Penetration Flow Path Containment Isolation Valve Position

Penetration Flow Path Containment Isolation Valve (CIV) Position is a Category 1 variable provided for verification of containment OPERABILITY. 1

CIV position is provided for verification of containment integrity. In the case of CIV position, the important information is the isolation status of the containment penetration. The LCO requires one channel of valve position indication in the control room to be OPERABLE for each active CIV in a containment penetration flow path, i.e., two total channels of CIV position indication for a penetration flow path with two active valves. For containment penetrations with only one active CIV having control room indication, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to redundantly verify the isolation status of each isolable penetration via indicated status of the active valve, as applicable, and prior knowledge of passive valve or system boundary status. If a penetration flow path is isolated, position indication for the CIV(s) in the associated penetration flow path is not needed to determine status. Therefore, the position indication for valves in an isolated penetration flow path is not required to be OPERABLE. Each penetration is treated separately and each penetration flow path is considered a separate function. Therefore, separate Condition entry is allowed for each inoperable penetration flow path.

~~[For this unit, the CIV position PAM instrumentation consists of the following:]~~ 3

9. Containment Area Radiation (high range)

Containment Area Radiation is a Category 1 variable provided to monitor for the potential of significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. 1

~~[For this unit,~~ Containment Area Radiation instrumentation consists of ~~the following:~~ Insert 5 ~~]~~ 3

Insert 5 1 3

two channels. Each channel consists of an ambient radiation detector mounted inside containment transmitting to an indicator in the control room. One channel is recorded. The containment wide range radiation monitors have a range of 1 r/hr to 10^8 r/hr.

BASES

LCO (continued)

10. Pressurizer Level

Pressurizer Level is a Category 1 variable used to determine whether to terminate safety injection (SI), if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer water level is also used to verify the plant conditions necessary to establish natural circulation in the RCS and to verify that the plant is maintained in a safe shutdown condition. 1

~~[For this unit,~~ Pressurizer Level instrumentation consists of ~~the following:]~~ Insert 6 3

11. Steam Generator Water Level

Steam Generator Water Level is a Type A and Category 1 variable provided to monitor operation of decay heat removal via the steam generators. The Category I indication of steam generator level ~~is the extended startup range level instrumentation. The extended startup range level~~ covers a span of ~~6~~ 0 inches to ~~394~~ 132 inches ~~above the lower tubesheet~~. The measured differential pressure is converted and displayed as 0 – 100% level. ~~in inches of water at 68°F~~. ~~Temperature compensation of this indication is performed manually by the operator.~~ Redundant monitoring capability is provided by two trains of instrumentation. ~~The uncompensated level signal is input to the plant computer, a control room indicator, and the [Auxiliary Feedwater (AFW)] Control System~~. 1 1

~~At some plants, o~~ O operator action is based on the control room indication of Steam Generator Water Level. The RCS response during a design basis small break LOCA is dependent on the break size. ~~For a certain range of break sizes, the boiler condenser mode of heat transfer is necessary to remove decay heat. At these plants, extended~~ Steam Generator Water L ~~startup range~~ level is a Type A variable because the operator must manually raise and control the steam generator level to establish steaming ~~boiler condenser heat transfer~~. Operator action is initiated on a loss of subcooled margin. Feedwater flow is increased until the indicated ~~extended startup range~~ level reaches the minimum required level ~~boiler condenser setpoint~~. 1

1

<u>Insert 6</u> 3

two channels. Each channel consists of a differential pressure instrument transmitting to an indicator in the control room. One channel is recorded. The pressurizer level instrument has a calibration range of 175 inches to 349 inches (0 – 100% indicated level).

BASES

LCO (continued)

12. Condensate Storage Tank (CST) Level

CST Level is a Category 1 variable provided to ensure water supply for ~~[~~AFW~~]~~. The CST provides the ensured safety grade water supply for the ~~[~~AFW~~]~~ System. ~~The CST consists of two identical tanks connected by a common outlet header.~~ Inventory is monitored by a 0 to ~~144 inch~~ 40 foot level indication ~~for each tank~~. CST Level is displayed on a control room indicator~~, strip chart recorder, and plant computer~~. In addition, a control room annunciator alarms on low level. 1 3 1

~~At some plants, CST Level is considered a Type A variable because the control room meter and annunciator are considered the primary indication used by the operator. The DBAs that require [AFW] are the loss of electric power, steam line break (SLB), and small break LOCA~~. The CST is the initial source of water for the ~~[~~AFW~~]~~ System. However, as the CST is depleted, manual operator action is necessary to replenish the CST or align suction to the ~~[AFW] pumps from the hotwell~~ Unit 2 CST. 3 3 1

13, 14, 15, 16. Core Exit Temperature

Core Exit Temperature is a Category 1 variable provided for verification and long term surveillance of core cooling. 1

An evaluation was made of the minimum number of valid core exit thermocouples necessary for inadequate core cooling detection. The evaluation determined the reduced complement of core exit thermocouples necessary to detect initial core uncovery and trend the ensuing core heatup. The evaluations account for core nonuniformities including incore effects of the radial decay power distribution and excore effects of condensate runback in the hot legs and nonuniform inlet temperatures. Based on these evaluations, adequate or inadequate core cooling detection is ensured with two valid core exit thermocouples per quadrant.

The design of the Incore Instrumentation System includes a Type K (chromel alumel) thermocouple within each of the 56 incore instrument detector assemblies.

BASES

LCO (continued)

The junction of each thermocouple is located a few inches above the fuel assembly, inside a structure that supports and shields the incore instrument detector assembly string from flow forces in the outlet plenum region. These core exit thermocouples monitor the temperature of the reactor coolant as it exits the fuel assemblies.

The core exit thermocouples have a usable temperature range from 32°F to 2300°F, although accuracy is reduced at temperatures above 1800°F.

17. ~~[Auxiliary Feedwater (AFW)] Flow~~ Insert 7 3

~~[AFW] Flow is provided to monitor operation of decay heat removal via the steam generators.~~

~~The [AFW] Flow to each steam generator is determined from a differential pressure measurement calibrated to a span of 0 gpm to 1200 gpm. Redundant monitoring capability is provided by two independent trains of instrumentation for each steam generator. Each differential pressure transmitter provides an input to a control room indicator and the plant computer. Since the primary indication used by the operator during an accident is the control room indicator, the PAM instrumentation Specification deals specifically with this portion of the instrument channel.~~ 1

~~At some plants [AFW] Flow is a Type A variable because operator action is required to throttle flow during an SLB accident in order to prevent the [AFW] pumps from operating in runout conditions. [AFW] Flow is also used by the operator to verify that the [AFW] System is delivering the correct flow to each steam generator. However, the primary indication used by the operator to ensure an adequate inventory is steam generator level.~~

Two channels are required to be OPERABLE for all but one Function. Two OPERABLE channels ensure that no single failure, within either the PAM instrumentation or its auxiliary supporting features or power sources (concurrent with the failures that are a condition of or result from a specific accident), prevents the operators from being presented the information necessary for them to determine the safety status of the plant and to bring the plant to and maintain it in a safe condition following that accident.

1

Insert 7

Containment Hydrogen Concentration

Containment Hydrogen Concentration is a Type A and Category 1 variable provided to allow an ability to measure containment hydrogen concentration without laboratory analysis. The channels provide indication over a range of 0 – 10%.

BASES

LCO (continued)

9

In Table 3.3.~~11~~-1 the exception to the two channel requirement is Containment Isolation Valve Position. 2

Two OPERABLE channels of core exit thermocouples are required for each channel in each quadrant to provide indication of radial distribution of the coolant temperature rise across representative regions of the core. Power distribution symmetry was considered in determining the specific number ~~and locations~~ provided for diagnosis of local core problems. ~~Therefore, two randomly selected thermocouples may not be sufficient to meet the two thermocouples per channel requirement in any quadrant. The two thermocouples in each channel must meet the additional requirement that one be located near the center of the core and the other near the core perimeter, such that the pair of core exit thermocouples indicate the radial temperature gradient across their core quadrant. Plant specific evaluations in response to Item II.F.2 of NUREG-0737 should have identified the thermocouple pairings that satisfy these requirements.~~ 1 Two sets of two thermocouples in each quadrant ensure a single failure will not disable the ability to determine the radial temperature gradient.

Core uniformities including in-core effects of the radial decay power distribution, ex-core effects of condensate runback in the hot legs and non-uniform inlet temperatures were accounted for in the evaluation.

For loop and steam generator related variables, the required information is individual loop temperature and individual steam generator level. In these cases two channels are required to be OPERABLE for each loop of steam generator to redundantly provide the necessary information.

In the case of Containment Isolation Valve Position, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active containment isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE.

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, plant conditions are such that the likelihood of an event occurring that would require PAM instrumentation is low; therefore, PAM instrumentation is not required to be OPERABLE in these MODES.

BASES

ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.~~11~~-1. The Completion Time(s) of the inoperable channel(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function. When the Required Channels in Table 3.3.~~11~~-1 are specified (e.g., on a ~~per steam line,~~ per loop, per SG, etc., basis) then Condition may be entered separately for each steam line, loop, SG, etc., as appropriate. 9 2 1

A.1

When one or more Functions have one required channel that is inoperable, the required inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel (or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval.

B.1

This Required Action specifies initiation of actions in accordance with Specification 5.6.~~5~~, which requires a written report to be submitted to the Nuclear Regulatory Commission. This report discusses the cause of the inoperability and identifies proposed restorative Required Actions. This Required Action is appropriate in lieu of a shutdown requirement, given the likelihood of plant conditions that would require information provided by this instrumentation. Also, alternative Required Actions are identified before a loss of functional capability condition occurs. 4 5

C.1

When one or more Functions have two required channels inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrumentation operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable

BASES

ACTIONS (continued)

because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

D.1

This Required Action directs entry into the appropriate Condition referenced in Table 3.3.~~11~~-1. The applicable Condition referenced in the Table is Function dependent. Each time Required Action C.1 is not met, and the associated Completion Time has expired, Condition D is entered for that channel and provides for transfer to the appropriate subsequent Condition.

E.1 and E.2

If the Required Action and associated Completion Time of Condition D is not met, and Table 3.3.~~11~~-1 directs entry into Condition E, the plant must be brought to a MODE in which the requirements of this LCO do not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

F.1

~~[At this plant,~~ alternate means of monitoring Reactor Vessel Water Level and Containment Area Radiation have been developed and tested. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the plant, but rather to follow the directions of Specification 5.6.~~5~~. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. ~~]~~

BASES

SURVEILLANCE REQUIREMENTS

A Note at the beginning of the Surveillance Requirements specifies that the following SRs apply to each PAM instrumentation Function in Table 3.3.~~11~~-1. 9 2

SR 3.3.~~11~~.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of 31 days is based upon plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel during normal operational use of the displays associated with this LCO's required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ (4)
~~---~~ ~~]~~ (3)

SR 3.3.~~11~~9.2 (2)

A CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies the channel responds to the measured parameter within the necessary range and accuracy. A Note allows exclusion of neutron detectors from the CHANNEL CALIBRATION.

~~[At this unit,~~ CHANNEL CALIBRATION shall find measurement errors are within the following acceptance criteria: ~~]~~ (3)

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~[The Frequency is based upon operating experience and consistency with the typical industry refueling cycle and is justified by an [18] month calibration interval for the determination of the magnitude of equipment drift.~~ (3)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ 3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~ 3

REFERENCES

1. ~~Plant specific document (e.g., FSAR, NRC Regulatory Guide 1.97, SER letter).~~ St. Lucie Unit No. 1 Engineering Evaluation of Instrumentation System for Regulatory Guide 1.97, Rev. 3 (ML17216A336). 1
2. Regulatory Guide 1.97, Rev. 3.
3. NUREG-0737, Supplement 1.
4. NRC Safety Evaluation Report (SER).

B 3.3 INSTRUMENTATION ~~(Analog)~~

9

B 3.3.~~11~~ Post Accident Monitoring (PAM) Instrumentation ~~(Analog)~~ 2

BASES

BACKGROUND

The primary purpose of the post accident monitoring (PAM) instrumentation is to display plant variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety Functions for Design Basis Events.

The OPERABILITY of the PAM instrumentation ensures that there is sufficient information available on selected plant parameters to monitor and assess plant status and behavior following an accident.

The availability of PAM instrumentation is important so that responses to corrective actions can be observed and the need for, and magnitude of, further actions can be determined. These essential instruments are identified in Reference 1 by ~~plant specific documents (Ref. 1)~~ addressing the recommendations of Regulatory Guide 1.97 (Ref. 2), as required by Supplement 1 to NUREG-0737, "TMI Action Items" (Ref. 3). 1

Type A variables are included in this LCO because they provide the primary information required to permit the control room operator to take specific manually controlled actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety functions for Design Basis Accidents (DBAs). ~~Because the list of Type A variables differs widely between plants, Table 3.3.11-1, in the accompanying LCO, contains no examples of Type A variables, except for those that may also be Category I.~~ 1

Category I variables are the key variables deemed risk significant because they are needed to:

- Determine whether other systems important to safety are performing their intended functions,
- Provide information to the operators that will enable them to determine the potential for causing a gross breach of the barriers to radioactivity release, and
- Provide information regarding the release of radioactive materials to allow for early indication of the need to initiate action necessary to protect the public and for an estimate of the magnitude of any impending threat.

BASES

BACKGROUND (continued)

These key variables are identified by plant specific Regulatory Guide 1.97 analyses (Ref. 1). These analyses identified the plant specific Type A and Category I variables and provided justification for deviating from the NRC proposed list of Category I variables.

~~REVIEWER'S NOTE~~
~~Table 3.3.11-1, in the accompanying LCO, provides a list of variables typical of those identified by plant specific Regulatory Guide 1.97 analyses. Table 3.3.11-1 in the plant specific Technical Specifications shall list all Type A and Category I variables identified by plant specific Regulatory Guide 1.97 analyses, as amended by NRC's Safety Evaluation Report (SER) (Ref. 4). The specific instrument Functions listed in Table 3.3.11-1 are discussed in the LCO Bases.~~

4

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the OPERABILITY of Regulatory Guide 1.97 Type A variables, so that the control room operating staff can:

- Perform the diagnosis specified in the emergency operating procedures. These variables are restricted to preplanned actions for the primary success path of DBAs and

- Take the specified, preplanned, manually controlled actions, for which no automatic control is provided, that are required for safety systems to accomplish their safety functions.

The PAM instrumentation also ensures OPERABILITY of Category I, non-Type A variables. This ensures the control room operating staff can:

- Determine whether systems important to safety are performing their intended functions,

- Determine the potential for causing a gross breach of the barriers to radioactivity release,

- Determine if a gross breach of a barrier has occurred, and

- Initiate action necessary to protect the public as well as to obtain an estimate of the magnitude of any impending threat.

BASES

APPLICABLE SAFETY ANALYSES (continued)

PAM instrumentation that satisfies the definition of Type A in Regulatory Guide 1.97 meets Criterion 3 of 10 CFR 50.36(c)(2)(ii).

Category I, non-Type A PAM instruments are retained in the Specification because they are intended to assist operators in minimizing the consequences of accidents. Therefore, these Category I variables are important in reducing public risk.

LCO

LCO 3.3.~~11~~ 9 requires two OPERABLE channels for all but one Function to ensure no single failure prevents the operators from being presented with the information necessary to determine the status of the plant and to bring the plant to, and maintain it in, a safe condition following that accident. 2

Furthermore, provision of two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information.

~~[More than two channels may be required at some units if the Regulatory Guide 1.97 analysis determined that failure of one PAM channel results in information ambiguity (that is, the redundant displays disagree) that could lead operators to defeat or to fail to accomplish a required safety function.]~~ 3

The exception to the two channel requirement is Penetration Flow Path Containment Isolation Valve Position. In this case, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active containment isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE. The applicable CIVs are identified in UFSAR Table 6.2-52. 1

Listed below are discussions of the specified instrument Functions listed in Table 3.3.~~11~~ 9-1. ~~These discussions are intended as examples of what should be provided for each Function when the plant specific list is prepared.~~ 2 1

BASES

LCO (continued)

1. Excore ~~[Logarithmic]~~ Neutron Flux (wide range) 1 3

Excore ~~[Logarithmic]~~ Neutron Flux ~~indication~~ is a Category 1 variable provided to verify reactor shutdown.

~~[At this unit, the [Logarithmic]~~ Excore Neutron Flux PAM channels consist of ~~the following:]~~ Insert 1

2, 3. Reactor Coolant System (RCS) Hot and Cold Leg Temperature

RCS Hot and Cold Leg Temperatures are Type A and Category I variables provided for verification of core cooling and long term surveillance. 1

Reactor coolant loop outlet temperature ~~inputs to the PAM are provided by two fast response resistance elements~~ consists of two channels per reactor coolant loop. Each channel consists of a resistance temperature detector and associated transmitter~~s~~ in each loop. The channels provide indication over a range of ~~32~~ 50°F to 7~~0~~ 5 0°F. Insert 2

4. ~~Reactor Coolant System~~ Pressurizer Pressure (wide range)

~~RCS~~ Pressurizer wide range pressure is a Type A and Category I variable provided for verification of core cooling and RCS integrity long term surveillance.

Wide range ~~RCS loop~~ Pressurizer pressure is measured by pressure transmitters with a span of 0 ~~psig~~ to 3000 psi~~g~~ a. The pressure transmitters are located ~~out~~ in side the containment. Redundant monitoring capability is provided by two trains of instrumentation. Control room indications are provided through the ~~inadequate core cooling (ICC) plasma~~ QSPDS display. The ~~ICC plasma~~ display is the primary indication used by the operator during an accident. Therefore, the PAM instrumentation LCO deals specifically with this portion of the instrument channel.

~~In some plants, RCS~~ Pressurizer pressure is a Type A variable because the operator uses this indication to monitor the cooldown of the RCS following a steam generator tube rupture or small break loss of coolant accident (LOCA). Operator actions to maintain a controlled cooldown, such as adjusting steam generator pressure or level, would use this indication. Furthermore, ~~RCS~~ Pressurizer pressure is one factor that may be used in decisions to terminate reactor coolant pump operation.

1

Insert 1

two channels; each consisting of a fission chamber detector assembly providing continuous independent indication in the Control Room and on the Hot Shutdown Panel. This signal is processed for a wide range of 2 x 10^{-8} to 200% power.

1

Insert 2

Channel output is provided to the Qualified Safety Parameter Display System (QSPDS) which provides control room indication.

BASES

LCO (continued)

5. Reactor Vessel Water Level

Reactor Vessel Water Level is a Category 1 variable provided for verification and long term surveillance of core cooling.

The Reactor Vessel Water Level monitoring system provides a direct measurement of the collapsed liquid level above the fuel alignment plate. The collapsed level represents the amount of liquid mass that is in the reactor vessel above the core. Measurement of the collapsed water level is selected because it is a direct indication of the water inventory. The collapsed level is obtained over the same temperature and pressure range as the saturation measurements, thereby encompassing all operating and accident conditions where it must function. Also, it functions during the recovery interval. Therefore, it is designed to survive the high steam temperature that may occur during the preceding core recovery interval.

The level range extends from the top of the vessel down to the top of the fuel alignment plate. The response time is short enough to track the level during small break LOCA events. The resolution is sufficient to show the initial level drop, the key locations near the hot leg elevation, and the lowest levels just above the alignment plate. This provides the operator with adequate indication to track the progression of the accident and to detect the consequences of its mitigating actions or the functionality of automatic equipment.

Each channel consists of eight sensors in a probe. A channel is OPERABLE if four sensors, with one sensor in the upper head and three sensors in the upper plenum, are OPERABLE.

6. Containment ~~Sump~~ Water Level (wide range)

Containment ~~Sump~~ Water Level is a Category 1 variable provided for verification and long term surveillance of RCS integrity.

~~[For this unit,~~ Containment ~~Sump~~ Water Level instrumentation consists of ~~the following:~~ Insert 3 ~~]~~

7. Containment Pressure (wide range)

Containment Pressure is a Category 1 variable provided for verification of RCS and containment OPERABILITY.

~~[For this unit,~~ Containment Pressure instrumentation consists of ~~the following:~~ Insert 4 ~~]~~

Insert 3

two channels. Each channel consists of a level transmitter with output to an indicator in the control room. Both channels are recorded. The wide range containment level transmitters are located outside containment. The wide range containment water level monitors have a range of -1 foot (bottom of the containment) to elevation 26 feet of the containment.

Insert 4

two channels. Each channel consists of a pressure transmitter mounted outside containment with output to an indicator in the control room. One channel is recorded. The containment wide range pressure monitors have a range of -5 to 175 psig.

BASES

LCO (continued)

8. Penetration Flow Path Containment Isolation Valve Position

Penetration Flow Path Containment Isolation Valve (CIV) Position is a Category 1 variable provided for verification of containment OPERABILITY. 1

CIV position is provided for verification of containment integrity. In the case of CIV position, the important information is the isolation status of the containment penetration. The LCO requires one channel of valve position indication in the control room to be OPERABLE for each active CIV in a containment penetration flow path, i.e., two total channels of CIV position indication for a penetration flow path with two active valves. For containment penetrations with only one active CIV having control room indication, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to redundantly verify the isolation status of each isolable penetration via indicated status of the active valve, as applicable, and prior knowledge of passive valve or system boundary status. If a penetration flow path is isolated, position indication for the CIV(s) in the associated penetration flow path is not needed to determine status. Therefore, the position indication for valves in an isolated penetration flow path is not required to be OPERABLE. Each penetration is treated separately and each penetration flow path is considered a separate function. Therefore, separate Condition entry is allowed for each inoperable penetration flow path.

~~[For this unit, the CIV position PAM instrumentation consists of the following:]~~ 3

9. Containment Area Radiation (high range)

Containment Area Radiation is a Category 1 variable provided to monitor for the potential of significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. 1

~~[For this unit,~~ Containment Area Radiation instrumentation consists of ~~the following:~~ Insert 5 ~~]~~ 3

Insert 5

1

3

two channels. Each channel consists of an ambient radiation detector mounted inside containment transmitting to an indicator in the control room. Both channels are recorded. The containment wide range radiation monitors have a range of 1 r/hr to 10^8 r/hr.

BASES

LCO (continued)

10. Pressurizer Level

a Category 1 variable 1

Pressurizer Level is used to determine whether to terminate safety injection (SI), if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer water level is also used to verify the plant conditions necessary to establish natural circulation in the RCS and to verify that the plant is maintained in a safe shutdown condition.

~~[For this unit,~~ Pressurizer Level instrumentation consists of ~~the following:]~~ 3

Insert 6

11. Steam Generator Water Level

a Type A and Category 1 variable

Steam Generator Water Level is provided to monitor operation of decay heat removal via the steam generators. The Category I indication of steam generator level ~~is the extended startup range level instrumentation. The extended startup range level~~ covers a span of 0 ~~6~~ inches to 183 ~~394~~ inches ~~above the lower tubesheet~~. The measured differential pressure is converted and displayed as 0 – 100% level. ~~in inches of water at 68°F~~. ~~Temperature compensation of this indication is performed manually by the operator.~~ Redundant monitoring capability is provided by two trains of instrumentation. ~~The uncompensated level signal is input to the plant computer, a control room indicator, and the [Auxiliary Feedwater (AFW)] Control System~~. 1

O

~~At some plants, o~~ Operator action is based on the control room indication of Steam Generator Water Level. The RCS response during a design basis small break LOCA is dependent on the break size. ~~For a certain range of break sizes, the boiler condenser mode of heat transfer is necessary to remove decay heat. At these plants, extended startup range~~ Steam Generator Water L level is a Type A variable because the operator must manually raise and control the steam generator level to establish steaming ~~boiler condenser heat transfer~~. Operator action is initiated on a loss of subcooled margin. Feedwater flow is increased until the indicated ~~extended startup range~~ level reaches the minimum required level ~~boiler condenser setpoint~~. 1

1

Insert 6 3

two channels. Each channel consists of a differential pressure instrument transmitting to an indicator in the control room. One channel is recorded. The pressurizer level instrument has a calibration range of 145.6 inches to 331.8 inches (0 – 100% indicated level).

BASES

LCO (continued)

12. Condensate Storage Tank (CST) Level

CST Level is a Category 1 variable provided to ensure water supply for ~~[~~AFW~~]~~. The CST provides the ensured safety grade water supply for the ~~[~~AFW~~]~~ System. ~~The CST consists of two identical tanks connected by a common outlet header.~~ Inventory is monitored by a 0 to ~~144 inch~~ 50 foot level indication ~~for each tank~~. CST Level is displayed on a control room indicator~~, strip chart recorder, and plant computer~~. In addition, a control room annunciator alarms on low level. 1 3

~~At some plants, CST Level is considered a Type A variable because the control room meter and annunciator are considered the primary indication used by the operator. The DBAs that require [AFW] are the loss of electric power, steam line break (SLB), and small break LOCA~~. The CST is the initial source of water for the ~~[~~AFW~~]~~ System. However, as the CST is depleted, manual operator action is necessary to replenish the CST ~~or align suction to the [AFW] pumps from the hotwell~~. 1 3 3 1

13, 14, 15, 16. Core Exit Temperature

Core Exit Temperature is a Category 1 variable provided for verification and long term surveillance of core cooling. 1

An evaluation was made of the minimum number of valid core exit thermocouples necessary for inadequate core cooling detection. The evaluation determined the reduced complement of core exit thermocouples necessary to detect initial core uncovery and trend the ensuing core heatup. The evaluations account for core nonuniformities including incore effects of the radial decay power distribution and excore effects of condensate runback in the hot legs and nonuniform inlet temperatures. Based on these evaluations, adequate or inadequate core cooling detection is ensured with two valid core exit thermocouples per quadrant.

The design of the Incore Instrumentation System includes a Type K (chromel alumel) thermocouple within each of the 56 incore instrument detector assemblies.

BASES

LCO (continued)

The junction of each thermocouple is located a few inches above the fuel assembly, inside a structure that supports and shields the incore instrument detector assembly string from flow forces in the outlet plenum region. These core exit thermocouples monitor the temperature of the reactor coolant as it exits the fuel assemblies.

The core exit thermocouples have a usable temperature range from 32°F to 2300°F, although accuracy is reduced at temperatures above 1800°F.

17. ~~[Auxiliary Feedwater (AFW)] Flow~~ Insert 7 3

~~[AFW] Flow is provided to monitor operation of decay heat removal via the steam generators.~~

~~The [AFW] Flow to each steam generator is determined from a differential pressure measurement calibrated to a span of 0 gpm to 1200 gpm. Redundant monitoring capability is provided by two independent trains of instrumentation for each steam generator. Each differential pressure transmitter provides an input to a control room indicator and the plant computer. Since the primary indication used by the operator during an accident is the control room indicator, the PAM instrumentation Specification deals specifically with this portion of the instrument channel.~~ 1

~~At some plants [AFW] Flow is a Type A variable because operator action is required to throttle flow during an SLB accident in order to prevent the [AFW] pumps from operating in runout conditions. [AFW] Flow is also used by the operator to verify that the [AFW] System is delivering the correct flow to each steam generator. However, the primary indication used by the operator to ensure an adequate inventory is steam generator level.~~

Two channels are required to be OPERABLE for all but one Function. Two OPERABLE channels ensure that no single failure, within either the PAM instrumentation or its auxiliary supporting features or power sources (concurrent with the failures that are a condition of or result from a specific accident), prevents the operators from being presented the information necessary for them to determine the safety status of the plant and to bring the plant to and maintain it in a safe condition following that accident.

1

Insert 7

Containment Hydrogen Concentration

Containment Hydrogen Concentration is a Type A and Category 1 variable provided to allow an ability to measure containment hydrogen concentration without laboratory analysis. The channels provide indication over a range of 0 – 10%.

BASES

LCO (continued)

9

In Table 3.3.~~11~~-1 the exception to the two channel requirement is Containment Isolation Valve Position. 2

Two OPERABLE channels of core exit thermocouples are required for each channel in each quadrant to provide indication of radial distribution of the coolant temperature rise across representative regions of the core. Power distribution symmetry was considered in determining the specific number ~~and locations~~ provided for diagnosis of local core problems. ~~Therefore, two randomly selected thermocouples may not be sufficient to meet the two thermocouples per channel requirement in any quadrant. The two thermocouples in each channel must meet the additional requirement that one be located near the center of the core and the other near the core perimeter, such that the pair of core exit thermocouples indicate the radial temperature gradient across their core quadrant. Plant specific evaluations in response to Item II.F.2 of NUREG-0737 should have identified the thermocouple pairings that satisfy these requirements.~~ Two sets of two thermocouples in each quadrant ensure a single failure will not disable the ability to determine the radial temperature gradient. 1

Core uniformities including in-core effects of the radial decay power distribution, ex-core effects of condensate runback in the hot legs and non-uniform inlet temperatures were accounted for in the evaluation.

For loop and steam generator related variables, the required information is individual loop temperature and individual steam generator level. In these cases two channels are required to be OPERABLE for each loop of steam generator to redundantly provide the necessary information.

In the case of Containment Isolation Valve Position, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active containment isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE.

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, plant conditions are such that the likelihood of an event occurring that would require PAM instrumentation is low; therefore, PAM instrumentation is not required to be OPERABLE in these MODES.

BASES

ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.~~11~~-1. The Completion Time(s) of the inoperable channel(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function. When the Required Channels in Table 3.3.~~11~~-1 are specified (e.g., on a ~~per steam line,~~ per loop, per SG, etc., basis) then Condition may be entered separately for each steam line, loop, SG, etc., as appropriate.

9 9 2 1

A.1

When one or more Functions have one required channel that is inoperable, the required inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel (or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval.

B.1

This Required Action specifies initiation of actions in accordance with Specification 5.6.~~5~~, which requires a written report to be submitted to the Nuclear Regulatory Commission. This report discusses the cause of the inoperability and identifies proposed restorative Required Actions. This Required Action is appropriate in lieu of a shutdown requirement, given the likelihood of plant conditions that would require information provided by this instrumentation. Also, alternative Required Actions are identified before a loss of functional capability condition occurs.

4 5

C.1

When one or more Functions have two required channels inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrumentation operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable

BASES

ACTIONS (continued)

because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

D.1

This Required Action directs entry into the appropriate Condition referenced in Table 3.3.~~11~~-1. The applicable Condition referenced in the Table is Function dependent. Each time Required Action C.1 is not met, and the associated Completion Time has expired, Condition D is entered for that channel and provides for transfer to the appropriate subsequent Condition. 9 2

E.1 and E.2

If the Required Action and associated Completion Time of Condition D is not met, and Table 3.3.~~11~~-1 directs entry into Condition E, the plant must be brought to a MODE in which the requirements of this LCO do not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. 9 2

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

F.1

~~[At this plant,~~ alternate means of monitoring Reactor Vessel Water Level and Containment Area Radiation have been developed and tested. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the plant, but rather to follow the directions of Specification 5.6.~~5~~. 4 The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. ~~]~~ 3 5

BASES

SURVEILLANCE REQUIREMENTS

A Note at the beginning of the Surveillance Requirements specifies that the following SRs apply to each PAM instrumentation Function in Table 3.3.~~11~~-1. 9 2

SR 3.3.~~11~~.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of 31 days is based upon plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel during normal operational use of the displays associated with this LCO's required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 3

SR 3.3.~~11~~.2 9 2

A CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies the channel responds to the measured parameter within the necessary range and accuracy. A Note allows exclusion of neutron detectors from the CHANNEL CALIBRATION.

~~[At this unit,~~ CHANNEL CALIBRATION shall find measurement errors are within the following acceptance criteria: ~~]~~ 3

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~[The Frequency is based upon operating experience and consistency with the typical industry refueling cycle and is justified by an [18] month calibration interval for the determination of the magnitude of equipment drift.~~ 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ 3

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-----]~~ 3

REFERENCES

1. ~~Plant specific document (e.g., FSAR, NRC Regulatory Guide 1.97, SER letter).~~ St. Lucie Unit No. 2 Engineering Evaluation of Instrumentation System for Regulatory Guide 1.97, Rev. 3 (ML17216A337). 1
2. Regulatory Guide 1.97, Rev. 3.
3. NUREG-0737, Supplement 1.
4. NRC Safety Evaluation Report (SER).

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.9 BASES, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.11 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2) and Chemical and Volume Control System (CVCS) Isolation Signal (ISTS 3.3.9). Therefore, ISTS 3.3.2 and ISTS 3.3.9 are not included in the PSL ITS. The successive Specifications are renumbered as necessary.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Changes have been made to reflect the change to numbering in ISTS Specification 5.6.5.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.9, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 10

3.3.10, REMOTE SHUTDOWN SYSTEM

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

A01

INSTRUMENTATION

REMOTE SHUTDOWN ~~INSTRUMENTATION~~ SYSTEM

LIMITING CONDITION FOR OPERATION

LCO 3.3.10 ~~3.3.3.5~~ The Remote Shutdown ~~monitoring instrumentation channels~~ System Functions ~~shown in Table 3.3-9~~ shall be OPERABLE ~~with readouts displayed external to the control room~~. LA01 LA02

Applicability **APPLICABILITY:** MODES 1, 2 and 3.

ACTION: Add proposed ACTIONS Note A02

Condition A ~~With the number of OPERABLE remote shutdown monitoring channels less than required by Table 3.3-9, either:~~ One or more required Functions inoperable

ACTION A.1 ~~a.~~ Restore ~~the inoperable channel~~ required Functions to OPERABLE status within 30 days, or

Add proposed ACTION B.1 M01

ACTION B.2 ~~b.~~ Be in ~~HOT SHUTDOWN~~ MODE 4 within ~~the next~~ 12 hours.

SURVEILLANCE REQUIREMENTS

~~**NOTE**~~
~~CHANNEL CALIBRATION is not applicable to the reactor trip breaker indication.~~ L01

SR 3.3.10.1 SR 3.3.10.2 ~~4.3.3.5~~ Each ~~remote shutdown monitoring~~ required instrumentation channel that is normally energized shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION ~~operations~~ in accordance with the Surveillance Frequency Control Program.

Add proposed SR 3.3.10.3 M02

LCO 3.3.10

~~TABLE 3.3-9~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~

LA01

~~INSTRUMENT~~	~~READOUT LOCATION~~	~~MEASUREMENT RANGE~~	~~MINIMUM CHANNELS OPERABLE~~
~~1. Reactor Trip Breaker Indication~~	~~SWGR~~	~~OPEN-CLOSE~~	~~1/trip breaker~~
~~2. Pressurizer Pressure~~	~~Hot Shutdown Panel~~	~~1500-2500 psia~~	~~1~~
~~3. Pressurizer Level~~	~~Hot Shutdown Panel~~	~~0-100%~~	~~1~~
~~4. Main Steam Pressure~~	~~Hot Shutdown Panel~~	~~0-1200 psig~~	~~1/steam generator~~
~~5. Steam Generator Level~~	~~Hot Shutdown Panel~~	~~0-100%~~	~~1/steam generator~~
~~6. Cold Leg Temperature~~	~~Hot Shutdown Panel~~	~~0-600°F~~	~~1~~

A01

~~DELETED~~

A01

~~DELETED~~

~~Pages 3/4 3-38 through 3/4 3-40 (Amendment No. 115) have been deleted from the Technical Specifications. The next page is 3/4 3-41.~~

INSTRUMENTATION

REMOTE SHUTDOWN SYSTEM ~~INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.10 ~~3.3.3.5~~ The remote shutdown system Functions ~~transfer switches, control and instrumentation channels shown in Table 3.3-9~~ shall be OPERABLE. LA01

Applicability **APPLICABILITY:** MODES 1, 2, and 3.

ACTION: Add proposed ACTIONS Note A02

Condition A ~~a.~~ One or more required Functions inoperable ~~With the number of OPERABLE remote shutdown channels less than the Required Number of Channels shown in Table 3.3-9, either~~ restore required Functions ~~the inoperable channel~~ to OPERABLE status within 30 days or be in MODE 4 ~~HOT SHUTDOWN~~ within ~~the next~~ 12 hours.

ACTION A.1
ACTION B.2
Add proposed ACTION B.1 M01

~~b. With the number of OPERABLE remote shutdown channels less than the Minimum Channels OPERABLE requirements of Table 3.3-9, either restore the inoperable channel to OPERABLE status within 7 days, or be in HOT SHUTDOWN within the next 12 hours.~~ L02

SURVEILLANCE REQUIREMENTS

~~**NOTE**~~
~~CHANNEL CALIBRATION is not applicable to reactor trip breaker indication.~~

L01

SR 3.3.10.1 SR 3.3.10.2 ~~4.3.3.5.1~~ Each required ~~remote shutdown monitoring~~ instrumentation channel that is normally energized shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION ~~operation~~s in accordance with the Surveillance Frequency Control Program.

Add proposed SR 3.3.10.3 M02

SR 3.3.10.4 ~~4.3.3.5.2~~ Each required ~~remote shutdown system~~ instrumentation transfer switch and control circuit ~~shall be demonstrated OPERABLE by verifying~~ its capabil~~ity~~ to perform the ~~its~~ intended function~~(s)~~ in accordance with the Surveillance Frequency Control Program.

ITS A01 ITS 3.3.10

LCO 3.3.10

~~TABLE 3.3-9~~

~~REMOTE SHUTDOWN SYSTEM INSTRUMENTATION~~

LA01 L02

~~INSTRUMENT~~	~~READOUT LOCATION~~	~~CHANNELS RANGE~~	~~REQUIRED NUMBER OF CHANNELS~~	~~MINIMUM CHANNELS OPERABLE~~
~~1. Power Range Neutron Flux~~	~~Hot Shutdown Panel~~	~~2 x 10^{-8}% - 200%~~	~~2~~	~~1~~
~~2. Reactor Trip Breaker Indication~~	~~Reactor Trip Switch Gear (RB)~~	~~OPEN-CLOSE~~	~~1/trip breaker~~	~~1/trip breaker~~
~~3. Reactor Coolant Temperature – T_{Cold}~~	~~Hot Shutdown Panel~~	~~0°F - 600°F~~	~~2~~	~~1~~
~~4. Pressurizer Pressure~~	~~Hot Shutdown Panel~~	~~0 - 3000 psia~~	~~2~~	~~1~~
~~5. Pressurizer Level~~	~~Hot Shutdown Panel~~	~~0 - 100% level~~	~~2~~	~~1~~
~~6. Steam Generator Pressure~~	~~Hot Shutdown Panel~~	~~0 - 1200 psia~~	~~1/steam generator~~	~~1/steam generator~~
~~7. Steam Generator Level~~	~~Hot Shutdown Panel~~	~~0 - 100% level~~	~~2/steam generator~~	~~1/steam generator~~
~~8. Shutdown Cooling Flow Rate~~	~~Hot Shutdown Panel~~	~~0 - 5000 gpm~~	~~2~~	~~1~~
~~9. Shutdown Cooling Temperature~~	~~Hot Shutdown Panel~~	~~0°F - 350°F~~	~~2~~	~~1~~
~~10. Diesel Generator Voltage~~	~~Hot Shutdown Panel~~	~~0 - 5250 V~~	~~1/diesel generator~~	~~1/diesel generator~~
~~11. Diesel Generator Power~~	~~Hot Shutdown Panel~~	~~0 - 5000 kW~~	~~1/diesel generator~~	~~1/diesel generator~~
~~12. Atmospheric Dump Valve Pressure~~	~~Hot Shutdown Panel~~	~~0 - 1200 psig~~	~~1/steam generator~~	~~1/steam generator~~
~~13. Charging Flow/Pressure~~	~~Hot Shutdown Panel~~	~~0 - 150 gpm/ 0 - 3000 psia~~	~~2~~	~~1~~
~~CONTROLS/ISOLATE SWITCHES~~				
~~1. Atmospheric Stm Dump Controllers~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A.~~	~~2/steam generator~~	~~1/steam generator~~
~~2. Aux. Spray Valves~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~2~~	~~1~~
~~3. Charging Pump Controls~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~3~~	~~2~~
~~4. Letdown Isol Valve~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~3~~	~~2~~
~~5. AFW Pump/Valve Controls~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~3~~	~~2~~
~~6. AFW Pump Steam Inlet Valve~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~2~~	~~1~~
~~7. Pzr Heater Controls~~	~~Hot Shutdown Panel/ RAB431~~	~~N.A~~	~~6~~	~~3~~

~~DELETED~~

DISCUSSION OF CHANGES
ITS 3.3.10, REMOTE SHUTDOWN SYSTEM

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2, Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications-Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 Unit 1 CTS 3.3.3.5 Action a , and Unit 2 CTS 3.3.3.5 Actions a and b, provide the compensatory actions to take when remote shutdown monitoring instrumentation is inoperable. ITS 3.3.10 ACTIONS provide the compensatory actions for inoperable remote shutdown monitoring instrumentation. The ITS 3.3.10 ACTIONS include a Note that allows separate Condition entry for each Function. This modifies the CTS by providing a specific allowance to enter the Action for each inoperable remote shutdown monitoring instrumentation Function. This change is acceptable because it clearly states the current requirement. The CTS considers each remote shutdown monitoring instrumentation Function to be separate and independent from the others. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.5 Action a requires that if an inoperable channel cannot be restored to OPERABLE status within the allowed completion time, then the unit shall be placed in HOT SHUTDOWN within the next 12 hours. ITS 3.3.10 ACTION B requires, if a required channel cannot be returned to OPERABLE status within the associated Completion Time, then the unit shall be in MODE 3 (HOT STANDBY) within 6 hours and MODE 4 (HOT SHUTDOWN) within 12 hours. This changes the CTS requirements by specifying that MODE 3 must be achieved within 6 hours. The purpose of ITS 3.3.10 Required Action B.1 is to specify consistent Completion Times to shutdown the unit from full power to MODE 3. This change is acceptable because the proposed Completion Time is sufficient to allow an operator to reduce power from full power to MODE 3 in a controlled manner without challenging unit safety systems. The 6 hour time provided to reach MODE 3 is also consistent with the time provided in similar actions in both the CTS and ITS. The change has been designated as more restrictive because it specifies the amount of time within which the unit must be placed in MODE 3.

M02 ITS SR 3.10.3.3 states "Perform CHANNEL FUNCTIONAL TEST of the reactor trip circuit breaker open/closed indication." CTS does not require this Surveillance. This changes CTS by adding a requirement to verify the OPERABILITY of the reactor trip circuit breaker (RTCB) open/closed indication by actuating the RTCBs at a Frequency in accordance with the Surveillance Frequency Control Program with an initial Frequency of 18 months.

The purpose of ITS SR 3.3.10.3 is to provide assurance that the reactor trip circuit breaker (RTCB) open/closed indication represents the correct position of the RTCBs when open and closed. This change is necessary to ensure sufficient testing is conducted at a frequency to assure that the correct open/closed position of the RTCBs is indicated and that the LCO will be met. This SR verifies the RCTB open/closed indication represents the correct position of the RTCBs when open and closed.

PSL controls periodic Frequencies for Surveillances in accordance with the Surveillance Frequency Control Program (SFCP) per CTS 6.8.4.o (Unit 1) and CTS 6.8.4.q (Unit 2). The performance Frequency of ITS SR 3.3.10.3 is in accordance with the SFCP. The initial periodic Frequency established in accordance with the SFCP will be 18 months consistent with the ISTS SR 3.3.12.4 and necessary because the RTCBs cannot be exercised while the unit is at power. Industry operating experience has shown that these components usually pass the Surveillance when performed at a Frequency of once every 18 months. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. See FPL (PSL Unit 1 and Unit 2) "Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program" (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066), which approved the adoption of a SFCP at PSL.

This change is designated as more restrictive because a Surveillance Requirement is added to the Technical Specifications.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.3.3.5 requires the remote shutdown monitoring instrumentation in Table 3.3-9 to be OPERABLE. CTS Table 3.3-9 lists each of the required remote shutdown monitoring instruments, the location of each instrument readout, the measurement range of each instrument, the minimum number of channels required for each instrument, and the minimum channels OPERABLE for each instrument (Unit 2). ITS LCO 3.3.10 states that the remote shutdown monitoring instrumentation Functions shall be OPERABLE. This changes the CTS by moving the details in Tables 3.3-9 from the Technical Specifications to the ITS Bases. Note that Discussion of Change L02 (Unit 2) describes deleting the minimum channels OPERABLE column in Unit 2 Table 3.3-9, while retaining the minimum number of channels required for each instrument requirement.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the remote shutdown monitoring instrumentation to be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 **Unit 1 only:** *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.3.3.5 states that the remote shutdown monitoring instrumentation channels shown in Table 3.3-9 shall be OPERABLE "with readouts displayed external to the control room." ITS LCO 3.3.10 states that the remote shutdown monitoring instrumentation Functions shall be OPERABLE. This changes the CTS by moving the requirement for readouts displayed external to the control room from the Technical Specifications to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the remote shutdown monitoring instrumentation to be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 5 – Deletion of Surveillance Requirement)* Unit 1 CTS 4.3.3.5 and Unit 2 CTS 4.3.3.5.1 include a Surveillance Requirements Note that states the CHANNEL CALIBRATION is not applicable to reactor trip breaker indication. ITS 3.3.10 Surveillance Requirements do not provide this note. Rather than a Note, ITS 3.3.10 provides Surveillance SR 3.3.10.3 which requires performing a CHANNEL FUNCTIONAL TEST of the reactor trip circuit breaker (RTCB) open/closed indication. This changes the CTS by deleting the Surveillance Requirements Note and adding ITS SR 3.3.10.3 to perform a CHANNEL FUNCTIONAL TEST of the reactor trip circuit breaker open/closed indication.

The purpose of Unit 1 CTS 4.3.3.5 and Unit 2 CTS 4.3.3.5.1 Surveillance Requirements Note is to clarify that CHANNEL CALIBRATION is not applicable to the reactor trip breaker indication. The purpose of ITS SR 3.3.10.3 is to perform a CHANNEL FUNCTIONAL TEST. This Surveillance verifies the OPERABILITY of the RTCB open/closed indication by actuating the RTCBs.

This change is acceptable because the deleted Surveillance Requirement Note is not necessary to verify that the remote shutdown reactor trip breaker indication used to meet the LCO can perform its required function. The addition of ITS SR 3.3.10.3 to perform a CHANNEL FUNCTIONAL TEST is appropriate to assure the remote shutdown reactor trip breaker indication continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L02 **Unit 2 only:** *(Category 4 – Relaxation of Required Action)* CTS LCO 3.3.3.5 requires the remote shutdown system instrumentation channels shown in Table 3.3.9 to be OPERABLE. CTS Action a requires that with the number of OPERABLE remote shutdown channels less than the required number of channels shown in Table 3.3-9, restore the inoperable channel to OPERABLE status within 30 days, or be in HOT SHUTDOWN within the next 12 hours. CTS Action b requires that with the number of OPERABLE remote shutdown channels less than the Minimum Channels OPERABLE shown in Table 3.3-9, restore the inoperable channel to OPERABLE status within 7 days, or be in HOT SHUTDOWN within the next 12 hours." ITS LCO 3.3.10 states that the Remote Shutdown System Functions shall be OPERABLE. ITS 3.3.10 Required Action A.1 states that with one or more required Functions inoperable, restore the required Functions to OPERABLE status within 30 days. If Required Action A.1 is not completed within the associated Completion Time, ACTION B is entered, and the unit must be in MODE 3 in 6 hours and MODE 4 in 12 hours. ITS 3.3.10 does not contain an Action to restore the inoperable channel to OPERABLE status within 7 days with the number of OPERABLE remote shutdown channels less than the Minimum Channels OPERABLE shown in Table 3.3-9. This changes the Unit 2 CTS by allowing 30 days instead of 7 days for a remote shutdown Function to be inoperable when the number of OPERABLE remote shutdown channels is less than the minimum channels OPERABLE shown in CTS Table 3.3-9 before requiring the unit to shutdown. This changes the CTS by retaining the required number of channels requirement and deleting the minimum channels OPERABLE requirement for each Function in Table 3.3-9. With the change from the 7-day to 30-day Completion Time when a Function does not meet the minimum channel OPERABLE requirement, deleting the minimum channels OPERABLE requirement for each Function in Table 3.3-9 is bounded by the fact that is most cases the required number of channels, which are retained in the CTS, is greater than the minimum required channels. In some cases the required number of channels is the same as the minimum channels OPERABLE. It should be noted that the PSL Unit 1 CTS 3.3.3.5 provides a 30 day allowed outage time when the number of OPERABLE remote shutdown channels is less than the Minimum Channels OPERABLE shown in CTS Table 3.3-9, so this change does not apply to Unit 1.

The proposed change is acceptable considering that the operability of the Remote Shutdown System instrumentation is not a specific assumption of a design basis accident analysis and the proposed 30-day Completion Time continues to provide a sufficient limit on plant operation if a Remote Shutdown Function is not restored to operable status. As such, the 30-day Completion is acceptable due to the lower safety significance of the Remote Shutdown System instrumentation relative to systems and components necessary to mitigate design basis accidents and considering the low probability of an event occurring within this time that would require the use of the Remote Shutdown System (i.e., control room evacuation). The proposed change provides additional operational flexibility for equipment restoration without significantly affecting the safe operation of the plant. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~12~~ 10 Remote Shutdown System ~~(Analog)~~ 3

3.3.3.5 LCO 3.3.~~12~~ 10 The Remote Shutdown System Functions shall be OPERABLE. 3

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTE---

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.3.3.5 Action a.	A. One or more required Functions inoperable.	A.1 Restore required Functions to OPERABLE status.	30 days	
DOC M01	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	6 hours	
3.3.3.5 Action b.		B.2 Be in MODE 4.	~~[~~12~~]~~ hours	2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.3.3.5 Table 3.3.3-9 DOC LA01	SR 3.3.~~12~~.1 10	~~[~~ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	3 2 2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
~~SR 3.3.12.2~~	~~Verify each required control circuit and transfer switch is capable of performing the intended function.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	1
4.3.3.5 Table 3.3.3-9 DOC LA01 SR 3.3.~~12.3~~ 10.2	------------------------------NOTE------------------------------ Neutron detectors are excluded from the CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
DOC M02 SR 3.3.~~12.4~~ 10.3	~~[~~ Perform CHANNEL FUNCTIONAL TEST of the reactor trip circuit breaker open/closed indication.	~~[18 months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	3 2 2

 3

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.~~12~~ 10 Remote Shutdown System ~~(Analog)~~ 3

3.3.3.5 LCO 3.3.~~12~~ 10 The Remote Shutdown System Functions shall be OPERABLE. 3

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

DOC A02
----------NOTE----------
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.3.3.5 Action a.	A. One or more required Functions inoperable.	A.1 Restore required Functions to OPERABLE status.	30 days	
DOC M01	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND	6 hours	
3.3.3.5 Action b.		B.2 Be in MODE 4.	~~[~~12~~]~~ hours	2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.3.3.5.1 Table 3.3.3-9 DOC LA01	SR 3.3.~~12~~ 10.1 ~~[~~ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	3 2 2

 3 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.3.3.5.2 Table 3.3.3-9 DOC LA01	SR 3.3.~~12.2~~ 10.4	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
4.3.3.5.1 Table 3.3.3-9 DOC LA01	SR 3.3.~~12.3~~ 10.2	------------------------------NOTE------------------------------ Neutron detectors are excluded from the CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 2 2
DOC M02	SR 3.3.~~12.4~~ 10.3	~~[~~ Perform CHANNEL FUNCTIONAL TEST of the reactor trip circuit breaker open/closed indication.	~~[18 months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	3 2 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.10, REMOTE SHUTDOWN SYSTEM

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~12~~ 10 Remote Shutdown System ~~(Analog)~~ 3

BASES

BACKGROUND

The Remote Shutdown System provides the control room operator with sufficient instrumentation and controls to place and maintain the unit in a safe shutdown condition from a location other than the control room. This capability is necessary to protect against the possibility that the control room becomes inaccessible. A safe shutdown condition is defined as MODE 3. With the unit in MODE 3, the ~~[~~Auxiliary Feedwater (AFW) System~~]~~ and ~~the steam generator safety valves or~~ the steam generator atmospheric dump valves can be used to remove core decay heat and meet all safety requirements. The long term supply of water for the ~~[~~AFW System~~]~~ and the ability to borate the Reactor Coolant System (RCS) from outside the control room allow extended operation in MODE 3. 2 1 2

In the event that the control room becomes inaccessible, the operators can establish control at the ~~remote~~ hot shutdown panel and place and maintain the unit in MODE 3. ~~Not all controls and necessary transfer switches are located at the remote shutdown panel. Some controls and transfer switches will be operated locally at the switchgear, motor control panels, or other local stations.~~ The unit automatically reaches MODE 3 following a unit shutdown and can be maintained safely in MODE 3 for an extended period of time. 1 1

The OPERABILITY of the Remote Shutdown System control and instrumentation Functions ensures that there is sufficient information available on selected plant parameters to place and maintain the plant in MODE 3, should the control room become inaccessible.

APPLICABLE SAFETY ANALYSES

The Remote Shutdown System is required to provide equipment at appropriate locations outside the control room with a capability to promptly shut down and maintain the plant in a safe condition in MODE 3.

The criteria governing the design and the specific system requirements of the Remote Shutdown System are located in 10 CFR 50, Appendix A, GDC 19 (Ref. 1).

The Remote Shutdown System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

LCO

The Remote Shutdown System LCO provides the requirements for the OPERABILITY of the instrumentation ~~and controls~~ necessary to place and maintain the unit in MODE 3 from a location other than the control room. The instrumentation ~~and controls~~ required are listed in Table B 3.3.~~12~~ 10-1. 1 1 3

BASES

LCO (continued)

~~The controls, instrumentation, and transfer switches are those required for:~~

- ~~Core Reactivity Control (initial and long term),~~
- ~~RCS Pressure Control,~~
- ~~Decay Heat Removal via the [AFW System] and the safety valves or steam generator ADVs,~~
- ~~RCS Inventory Control via charging flow, and~~
- ~~Safety support systems for the above Functions, as well as service water, component cooling water, and onsite power including the diesel generators.~~

A Function of a Remote Shutdown System is OPERABLE if all instrument ~~and control~~ channels needed to support the remote shutdown Functions are OPERABLE. ~~In some cases, Table B 3.3.12-1 may indicate that the required information or control capability is available from several alternate sources. In these cases, the Function is OPERABLE as long as one channel of any of the alternate information or control sources for each Function is OPERABLE.~~

The Remote Shutdown System instrumentation ~~and control circuits~~ covered by this LCO do not need to be energized to be considered OPERABLE. This LCO is intended to ensure that the instruments ~~and control circuits~~ will be OPERABLE if plant conditions require that the Remote Shutdown System be placed in operation.

APPLICABILITY

The Remote Shutdown System LCO is applicable in MODES 1, 2, and 3. This is required so that the unit can be placed and maintained in MODE 3 for an extended period of time from a location other than the control room.

This LCO is not applicable in MODE 4, 5, or 6. In these MODES, the unit is already subcritical and in the condition of reduced RCS energy. Under these conditions, considerable time is available to restore necessary instrument ~~control~~ Functions if control room instruments ~~or control~~ become unavailable.

BASES

ACTIONS

A Remote Shutdown System ~~division~~ channel is inoperable when ~~each~~ a Function ~~is not accomplished by at least one designated Remote Shutdown System channel that satisfies the~~ does not satisfy the minimum channels OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases.

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function.

A.1

Condition A addresses the situation where one or more ~~channels~~ required Functions of the Remote Shutdown System are inoperable. ~~This includes the control and transfer switches for any required Function.~~

The Required Action is to restore the ~~divisions~~ required Functions to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

B.1 and B.2

If the Required Action and associated Completion Time of Condition A are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

~~[~~ SR 3.3.~~12~~10.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. As specified in the Surveillance, a CHANNEL CHECK is only required for those channels that are normally energized. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of 31 days is based on plant operating experience that demonstrates channel failure is rare.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~

~~SR 3.3.12.2~~ 1

~~SR 3.3.12.2 verifies that each required Remote Shutdown System transfer switch and control circuit performs its intended function. This verification is performed from the reactor shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the plant can be placed and maintained in MODE 3 from the reactor shutdown panel and the local control stations. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an~~ 1

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~unplanned transient if the Surveillance were performed with the reactor at power. Operating experience demonstrates that Remote Shutdown System control channels seldom fail to pass the Surveillance when performed at a Frequency of once every [18] months.~~ 1

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ 1

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~

SR 3.3.~~12.3~~ 10.2 3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to the measured parameter within the necessary range and accuracy. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~[The 18 month Frequency is based upon 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.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ 4

The SR is modified by a Note, which excludes neutron detectors from the CHANNEL CALIBRATION.

[SR 3.3.~~12.4~~ 10.3 3

SR 3.3.~~12.4~~ 10.3 is the performance of a CHANNEL FUNCTIONAL TEST. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This Surveillance should verify the OPERABILITY of the reactor trip circuit breaker (RTCB) open/closed indication ~~on the remote shutdown panels~~ by actuating the RTCBs. ~~[The Frequency of 18 months was chosen because the RTCBs cannot be exercised while the unit is at power. Operating experience has shown that these components usually pass the Surveillance when performed at a Frequency of once every 18 months. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ 1 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]]~~ 4

BASES

REFERENCES	1.	10 CFR 50, Appendix A, GDC 19.
	2.	NRC Safety Evaluation Report (SER).

Table B 3.3.~~12~~ 10-1 (page 1 of 1)
Remote Shutdown System Instrumentation ~~and Controls~~

~~NOTE~~
~~This Table is for illustration purposes only. It does not attempt to encompass every Function used at every unit, but does contain the types of Functions commonly found.~~

INSERT 1

~~FUNCTION/INSTRUMENT OR CONTROL PARAMETER~~	~~REQUIRED NUMBER OF DIVISIONS~~
~~1. Reactivity Control~~	
~~a. Log Power Neutron Flux~~	~~[1]~~
~~b. Source Range Neutron Flux~~	~~[1]~~
~~c. Reactor Trip Circuit Breaker Position~~	~~[1 per trip breaker]~~
~~d. Manual Reactor Trip~~	~~[2]~~
~~2. Reactor Coolant System Pressure Control~~	
~~a. Pressurizer Pressure or RCS Wide Range Pressure~~	~~[1]~~
~~b. Pressurizer Power Operated Relief Valve Control and Block Valve Control~~	~~[1, controls must be for power operated relief valve and block valves on same line]~~
~~3. Decay Heat Removal via Steam Generators~~	
~~a. Reactor Coolant\ Hot Leg Temperature~~	~~[1 per loop]~~
~~b. Reactor Coolant Cold Leg Temperature~~	~~[1 per loop]~~
~~c. Auxiliary Feedwater Controls~~	~~[1]~~
~~d. Steam Generator Pressure~~	~~[1 per steam generator]~~
~~e. Steam Generator Level or Auxiliary Feedwater Flow~~	~~[1 per steam generator]~~
~~f. Condensate Storage Tank Level~~	~~[1]~~
~~4. Reactor Coolant System Inventory Control~~	
~~a. Pressurizer Level~~	~~[1]~~
~~b. Reactor Coolant Charging Pump Controls~~	~~[1]~~

~~REVIEWER'S NOTE~~
~~The number of channels that fulfill GDC 19 requirements for the number of OPERABLE channels required depends upon the plant's licensing basis as described in the NRC plant specific Safety Evaluation Report (SER) (Ref. 2). Generally, two divisions are required to be OPERABLE. However, only one channel is required if the plant has justified such a design and the NRC's SER accepted the justification.~~

3 1 1 4 5 3 1

1

INSERT 1

	INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	REQUIRED CHANNELS
1.	Reactor Trip Breaker Indication	SWGR	Open-Close	1/trip breaker
2.	Pressurizer Pressure	Hot Shutdown Panel	1500-2500 psia	1
3.	Pressurizer Level	Hot Shutdown Panel	0-100%	1
4.	Steam Generator Pressure	Hot Shutdown Panel	0-1200 psig	1/steam generator
5.	Steam Generator Level	Hot Shutdown Panel	0-100%	1/steam generator
6.	Cold Leg Temperature	Hot Shutdown Panel	0-600°F	1

3

B 3.3 INSTRUMENTATION ~~(Analog)~~

B 3.3.~~12~~ 10 Remote Shutdown System ~~(Analog)~~

3

BASES

BACKGROUND	The Remote Shutdown System provides the control room operator with sufficient instrumentation and controls to place and maintain the unit in a safe shutdown condition from a location other than the control room. This capability is necessary to protect against the possibility that the control room becomes inaccessible. A safe shutdown condition is defined as MODE 3. With the unit in MODE 3, the ~~[~~Auxiliary Feedwater (AFW) System~~]~~ and ~~the steam generator safety valves or~~ the steam generator atmospheric dump valves can be used to remove core decay heat and meet all safety requirements. The long term supply of water for the ~~[~~AFW System~~]~~ and the ability to borate the Reactor Coolant System (RCS) from outside the control room allow extended operation in MODE 3. 2 1 2 1 In the event that the control room becomes inaccessible, the operators can establish control at the ~~remote~~ hot shutdown panel and place and maintain the unit in MODE 3. Not all controls and necessary transfer switches are located at the remote shutdown panel. Some controls and transfer switches will be operated locally at the switchgear, motor control panels, or other local stations. The unit automatically reaches MODE 3 following a unit shutdown and can be maintained safely in MODE 3 for an extended period of time. The OPERABILITY of the Remote Shutdown System control and instrumentation Functions ensures that there is sufficient information available on selected plant parameters to place and maintain the plant in MODE 3, should the control room become inaccessible.
APPLICABLE SAFETY ANALYSES	The Remote Shutdown System is required to provide equipment at appropriate locations outside the control room with a capability to promptly shut down and maintain the plant in a safe condition in MODE 3. The criteria governing the design and the specific system requirements of the Remote Shutdown System are located in 10 CFR 50, Appendix A, GDC 19 (Ref. 1). The Remote Shutdown System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).
LCO	The Remote Shutdown System LCO provides the requirements for the OPERABILITY of the instrumentation and controls necessary to place and maintain the unit in MODE 3 from a location other than the control room. The instrumentation and controls required are listed in Table B 3.3.~~12~~ 10-1. 3

3

BASES

LCO (continued)

~~The controls, instrumentation, and transfer switches are those required for:~~

- ~~Core Reactivity Control (initial and long term),~~
- ~~RCS Pressure Control,~~
- ~~Decay Heat Removal via the [AFW System] and the safety valves or steam generator ADVs,~~
- ~~RCS Inventory Control via charging flow, and~~
- ~~Safety support systems for the above Functions, as well as service water, component cooling water, and onsite power including the diesel generators.~~

1

A Function of a Remote Shutdown System is OPERABLE if all instrument and control channels needed to support the remote shutdown Functions are OPERABLE. ~~In some cases, Table B 3.3.12-1 may indicate that the required information or control capability is available from several alternate sources. In these cases, the Function is OPERABLE as long as one channel of any of the alternate information or control sources for each Function is OPERABLE.~~ 1

The Remote Shutdown System instrumentation and control circuits covered by this LCO do not need to be energized to be considered OPERABLE. This LCO is intended to ensure that the instrument s and control circuits will be OPERABLE if plant conditions require that the Remote Shutdown System be placed in operation. 1

APPLICABILITY

The Remote Shutdown System LCO is applicable in MODES 1, 2, and 3. This is required so that the unit can be placed and maintained in MODE 3 for an extended period of time from a location other than the control room.

This LCO is not applicable in MODE 4, 5, or 6. In these MODES, the unit is already subcritical and in the condition of reduced RCS energy. Under these conditions, considerable time is available to restore necessary instrument control Functions if control room instruments or control become unavailable.

3 1

BASES

ACTIONS

A Remote Shutdown System ~~division~~ channel is inoperable when ~~each~~ a Function ~~is not accomplished by at least one designated Remote Shutdown System channel that satisfies the~~ does not satisfy the required number of channels or the minimum channels OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases. 1

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function, starting from the time the Condition was entered for that Function.

A.1

Condition A addresses the situation where one or more ~~channels~~ required Functions of the Remote Shutdown System are inoperable. This includes the control and transfer switches for any required Function. 1

The Required Action is to restore the ~~divisions~~ required Functions to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room. 1

B.1 and B.2

If the Required Action and associated Completion Time of Condition A are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within ~~[~~12~~]~~ hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems. 2

SURVEILLANCE REQUIREMENTS

~~[~~ SR 3.3.~~12~~10.1 2 3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that

BASES

SURVEILLANCE REQUIREMENTS (continued)

the instrumentation continues to operate properly between each CHANNEL 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 sensor or the signal processing equipment has drifted outside its limit. As specified in the Surveillance, a CHANNEL CHECK is only required for those channels that are normally energized. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

~~[The Frequency of 31 days is based on plant operating experience that demonstrates channel failure is rare.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~

SR 3.3.~~12.2~~ 10.4 3

SR 3.3.~~12.2~~ 10.4 verifies that each required Remote Shutdown System transfer switch and control circuit performs its intended function. This verification is performed from the reactor shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the plant can be placed and maintained in MODE 3 from the reactor shutdown panel and the local control stations. ~~[The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an~~ 2

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~unplanned transient if the Surveillance were performed with the reactor at power. Operating experience demonstrates that Remote Shutdown System control channels seldom fail to pass the Surveillance when performed at a Frequency of once every [18] months.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-----]~~

SR 3.3.~~12.3~~ 10.2 3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to the measured parameter within the necessary range and accuracy. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

~~[The 18 month Frequency is based upon 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.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

3

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~

The SR is modified by a Note, which excludes neutron detectors from the CHANNEL CALIBRATION.

[SR 3.3.~~12.4~~ 10.3 3

SR 3.3.~~12.4~~ is the performance of a CHANNEL FUNCTIONAL TEST. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This Surveillance should verify the OPERABILITY of the reactor trip circuit breaker (RTCB) open/closed indication ~~on the remote shutdown panels~~ by actuating the RTCBs. ~~[The Frequency of 18 months was chosen because the RTCBs cannot be exercised while the unit is at power. Operating experience has shown that these components usually pass the Surveillance when performed at a Frequency of once every 18 months. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~ 1 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]]~~

3 1

BASES

REFERENCES	1.	10 CFR 50, Appendix A, GDC 19.
	2.	NRC Safety Evaluation Report (SER).

3

10

Table B 3.3.~~12~~-1 (page 1 of 1)
Remote Shutdown System Instrumentation ~~and Controls~~

1

~~NOTE~~
~~This Table is for illustration purposes only. It does not attempt to encompass every Function used at every unit, but does contain the types of Functions commonly found.~~

INSERT 1

1

~~FUNCTION/INSTRUMENT OR CONTROL PARAMETER~~	~~REQUIRED NUMBER OF DIVISIONS~~
~~1. Reactivity Control~~	
~~a. Log Power Neutron Flux~~	~~[1]~~
~~b. Source Range Neutron Flux~~	~~[1]~~
~~c. Reactor Trip Circuit Breaker Position~~	~~[1 per trip breaker]~~
~~d. Manual Reactor Trip~~	~~[2]~~
~~2. Reactor Coolant System Pressure Control~~	
~~a. Pressurizer Pressure or RCS Wide Range Pressure~~	~~[1]~~
~~b. Pressurizer Power Operated Relief Valve Control and Block Valve Control~~	~~[1, controls must be for power operated relief valve and block valves on same line]~~
~~3. Decay Heat Removal via Steam Generators~~	
~~a. Reactor Coolant\ Hot Leg Temperature~~	~~[1 per loop]~~
~~b. Reactor Coolant Cold Leg Temperature~~	~~[1 per loop]~~
~~c. Auxiliary Feedwater Controls~~	~~[1]~~
~~d. Steam Generator Pressure~~	~~[1 per steam generator]~~
~~e. Steam Generator Level or Auxiliary Feedwater Flow~~	~~[1 per steam generator]~~
~~f. Condensate Storage Tank Level~~	~~[1]~~
~~4. Reactor Coolant System Inventory Control~~	
~~a. Pressurizer Level~~	~~[1]~~
~~b. Reactor Coolant Charging Pump Controls~~	~~[1]~~

~~REVIEWER'S NOTE~~
~~The number of channels that fulfill GDC 19 requirements for the number of OPERABLE channels required depends upon the plant's licensing basis as described in the NRC plant specific Safety Evaluation Report (SER) (Ref. 2). Generally, two divisions are required to be OPERABLE. However, only one channel is required if the plant has justified such a design and the NRC's SER accepted the justification.~~

4

3

1

1

INSERT 1

	INSTRUMENT	LOCATION	RANGE	REQUIRED CHANNELS
1.	Power Range Neutron Flux	Hot Shutdown Panel	$2 \times 10^{-8}\%$ - 200%	2
2.	Reactor Trip Breaker Indication	Reactor Trip Switch Gear (RB)	OPEN-CLOSE	1/trip breaker
3.	Reactor Coolant Temperature – T_{Cold}	Hot Shutdown Panel	0°F - 600°F	2
4.	Pressurizer Pressure	Hot Shutdown Panel	0 - 3000 psia	2
5.	Pressurizer Level	Hot Shutdown Panel	0 - 100% level	2
6.	Steam Generator Pressure	Hot Shutdown Panel	0 - 1200 psia	1/steam generator
7.	Steam Generator Level	Hot Shutdown Panel	0 - 100% level	2/steam generator
8.	Shutdown Cooling Flow Rate	Hot Shutdown Panel	0 - 5000 gpm	2
9.	Shutdown Cooling Temperature	Hot Shutdown Panel	0°F - 350°F	2
10.	Diesel Generator Voltage	Hot Shutdown Panel	0 - 5250 V	1/diesel generator
11.	Diesel Generator Power	Hot Shutdown Panel	0 - 5000 kW	1/diesel generator
12.	Atmospheric Dump Valve Pressure	Hot Shutdown Panel	0 - 1200 psig	1/steam generator
13.	Charging Flow/Pressure	Hot Shutdown Panel	0 - 150 gpm/ 0 - 3000 psia	2
	CONTROLS / ISOLATE SWITCHES			
1.	Atmospheric Stm Dump Controllers	Hot Shutdown Panel/ RAB431	Not Applicable	2/steam generator
2.	Aux. Spray Valves	Hot Shutdown Panel/ RAB431	Not Applicable	2
3.	Charging Pump Controls	Hot Shutdown Panel/ RAB431	Not Applicable	3
4.	Letdown Isol Valve	Hot Shutdown Panel/ RAB431	Not Applicable	3
5.	AFW Pump/Valve Controls	Hot Shutdown Panel/ RAB431	Not Applicable	3
6.	AFW Pump Steam Inlet Valve	Hot Shutdown Panel/ RAB431	Not Applicable	2
7.	Pzr Heater Controls	Hot Shutdown Panel/ RAB431	Not Applicable	6

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.10, BASES, REMOTE SUTDOWN SYSTEM

1. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, licensing basis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Combustion Engineering vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

3. Changes are made to reflect the ITS Specification number and title.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. **Unit 1 only:** The ITS maintains one required channel for each Remote shutdown System Function consistent with the equivalent CTS requirement and licensing basis.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.10, REMOTE SHUTDOWN SYSTEM

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 11

3.3.11, Logarithmic Neutron Flux Monitoring

Current Technical Specifications (CTS) Markup and Discussion of Changes (DOCs)

3/4.3 INSTRUMENTATION

Logarithmic Neutron Flux Monitoring

3/4.3.1 ~~REACTOR PROTECTIVE INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.11 3.3.1.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1~~ shall be OPERABLE. A02

Two logarithmic neutron flux monitoring channels

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-1.~~

MODES 3, 4, and 5.

ACTION:

ACTIONS As shown in ~~Table 3.3-1~~. ACTION A

Add proposed SR 3.3.11.2 L01

SURVEILLANCE REQUIREMENTS

required

SR 3.3.11.1 4.3.1.1.1 Each ~~reactor protective instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION ~~and CHANNEL FUNCTIONAL TEST operations during the modes and at the frequencies shown in Table 4.3-1~~. L01

in accordance with the Surveillance Frequency Control Program

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. Each test shall include at least one channel per function.

See ITS 3.3.1

~~TABLE 3.3-1 (Continued)~~

~~REACTOR PROTECTIVE INSTRUMENTATION~~ Logarithmic Neutron Flux Monitoring

~~FUNCTIONAL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	LA01
~~11.~~ ~~Wide Range~~ Logarithmic Neutron Flux Monitor						
a. Startup and Operating -- Rate of Change of Power – High	4	2(d)	3	1**, 2 and *	2	See ITS 3.3.1
LCO 3.3.11 Applicability ACTION A ~~b. Shutdown~~	~~4~~ 6	~~0~~	2	3, 4, 5	~~3~~ A	
12. Reactor Protection System Logic	4	2	4	1, 2*	4	See ITS 3.3.2
13. Reactor Trip Breakers	4	2	4	1, 2*	4	

L02

LA01

~~TABLE 3.3-1 (Continued)~~

~~ACTION STATEMENTS~~

b. Within one hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

c. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on than channel provided the other inoperable channel is placed in the tripped condition.

See ITS 3.3.1

Add proposed Required Action A.1 and Note

M01

Required Action A.2

~~ACTION 3~~ - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1~~.1 or 3.1.1.2, as applicable,~~ within ~~1 hour~~ 4 hours and at least once per 12 hours thereafter.

L03

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.1.

See ITS 3.3.2

~~TABLE 4.3-1~~

~~REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

Logarithmic Neutron Flux Monitoring

FUNCTION~~AL UNIT~~	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
1. Manual Reactor Trip	N/A	N.A.	S/U(1)	N/A	See ITS 3.3.2
2. Power Level – High					
a. Nuclear Power	SFCP	SFCP(2), SFCP(3), SFCP(5)	SFCP	1,2	
b. ΔT Power	SFCP	SFCP(4), SFCP	SFCP	1	
3. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	
4. Pressurizer Pressure – High	SFCP	SFCP	SFCP	1, 2	
5. Containment Pressure – High	SFCP	SFCP	SFCP	1, 2	
6. Steam Generator Pressure – Low	SFCP	SFCP	SFCP	1, 2	See ITS 3.3.1
7. Steam Generator Water Level – Low	SFCP	SFCP	SFCP(6, 7)	1, 2	
8. Local Power Density – High	SFCP	SFCP	SFCP	1	
9. Thermal Margin/Low Pressure	SFCP	SFCP	SFCP	1, 2	
9a. Steam Generator Pressure Difference – High	SFCP	SFCP	SFCP	1, 2	
10. Loss of Turbine -- Hydraulic Fluid Pressure – Low	N.A.	N.A.	S/U(1)	N.A.	
SR 3.3.11.1 SR 3.3.11.2 11. ~~Wide Range~~ Logarithmic Neutron Flux Monitor	SFCP	~~N.A.~~ SFCP L01	~~S/U(1)~~ L01	1, 2, 3, 4, 5 and *	
12. Reactor Protection System Logic	N.A.	N.A.	SFCP and S/U(1)	1, 2 and *	See ITS 3.3.2
13. Reactor Trip Breakers	N.A.	N.A.	SFCP	1, 2 and *	

TABLE 4.3-1 (Continued)

TABLE NOTATION

* - With reactor trip breaker closed.

See ITS 3.3.2

~~(1) - If not performed in previous 7 days.~~

L01

(2) - Heat balance only, above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometer to null "Nuclear Pwr – ΔT Pwr." During PHYSICS TESTS, these daily calibrations of nuclear power and ΔT power may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(3) - Above 15% of RATED THERMAL POWER, recalibrate the excore detectors which monitor the AXIAL SHAPE INDEX by using the incore detectors or restrict THERMAL POWER during subsequent operations to $\leq$ 90% of the maximum allowed THERMAL POWER level with the existing Reactor Coolant Pump combination.

(4) - Adjust "ΔT Pwr Calibrate" potentiometers to make ΔT power signals agree with calorimetric calculation.

(5) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(6) - If the as-found setpoint is either outside its predefined as-found acceptance criteria band or is not conservative with respect to the Allowable Value, then the channel shall be declared inoperable and shall be evaluated to verify that it is functioning as required before returning the channel to service.

(7) - The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Field Trip Setpoint, otherwise that channel shall not be returned to OPERABLE status. The Field Trip Setpoint and the methodology used to determine the Field Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in the UFSAR Section 7.2.

See ITS 3.3.1

3/4.3 INSTRUMENTATION

Logarithmic Neutron Flux Monitoring

3/4.3.1 ~~REACTOR PROTECTIVE INSTRUMENTATION~~

LIMITING CONDITION FOR OPERATION

LCO 3.3.11 3.3.1 ~~As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1~~ shall be OPERABLE. Two logarithmic neutron flux monitoring channels

A02

Applicability **APPLICABILITY**: ~~As shown in Table 3.3-1~~. MODES 3, 4, and 5.

ACTION:

ACTIONS As shown in ~~Table 3.3-1~~. ACTION A

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1
SR 3.3.11.2 4.3.1.1 Each required ~~reactor protective instrumentation~~ channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION ~~and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1~~. in accordance with the Surveillance Frequency Control Program

A03

4.3.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing. Each test shall include at least one channel per function.

See ITS 3.3.1

A01

ITS

~~TABLE 3.3-1~~

~~REACTOR PROTECTIVE INSTRUMENTATION~~ Logarithmic Neutron Flux Monitoring

LA01

~~FUNCTIONAL UNIT~~	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
1. Manual Reactor Trip	4 4	~~2~~ ~~2~~	4 4	1, 2 3*, 4*, 5*	1 5	See ITS 3.3.2
2. Variable Power Level – High	4	2(a)(d)	3	1, 2	2	See ITS 3.3.1
3. Pressurizer Pressure – High	4	2	3	1, 2	2	
4. Thermal Margin/Low Pressure	4	2(a)(d)	3	1, 2	2	
5. Containment Pressure – High	4	2	3	1, 2	2	
6. Steam Generator Pressure – Low	4/SG	2/SG(b)	3/SG	1, 2	2	
7. Steam Generator Pressure Difference – High	4	2(a)(d)	3	1, 2	2	
8. Steam Generator Level – Low	4/SG	2/SG	3/SG	1, 2	2	
9. Local Power Density – High	4	2(c)(d)	3	1	2	
10. Loss of Component Cooling Water to Reactor Coolant Pumps	4	2	3	1, 2	2	
11. Reactor Protection System Logic	4	2	3	1, 2 3*, 4*, 5*	2 5	See ITS 3.3.2
12. Reactor Trip Breakers	4	2(f)	4	1, 2 3*, 4*, 5*	4 5	
13. ~~Wide Range~~ Logarithmic Neutron Flux Monitor						
a. Startup and Operating – Rate of Change of Power – High	4	2(e)(g)	3	1**, 2	2	See ITS 3.3.1
b. ~~Shutdown~~ (LCO 3.3.11 Applicability ACTION A)	~~4~~ 8	~~0~~	2	3, 4, 5	~~3~~ A	
14. Reactor Coolant Flow – Low	4/SG	2/SG(a)(d)	3/SG	1, 2	2	See ITS 3.3.1
15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	4	2(c)	3	1	2	

L02

LA01

~~TABLE 3.3-1 (Continued)~~

~~ACTION STATEMENTS~~

See ITS 3.3.1

ACTION 2 - (Continued)

6.	Cold Leg Temperature	Variable Power Level – High (RPS) Thermal Margin/Low Pressure (RPS) Local Power Density – High (RPS)
7.	Hot Leg Temperature	Variable Power Level – High (RPS) Thermal Margin /Low Pressure (RPS) Local Power Density – High (RPS)

ACTION A

~~ACTION 3~~ - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes*. Verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1~~.1 or 3.1.1.2, as applicable,~~ within ~~1 hour~~ 4 hours and at least once per 12 hours thereafter.

L03

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirements, STARTUP and/or POWER OPERATION may continue provided the reactor trip breakers of the inoperable channel are placed in the tripped condition within 1 hour, otherwise, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour, provided the trip breakers of any inoperable channel are in the tripped condition, for surveillance testing per Specification 4.3.1.1.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

Required Action A.1 NOTE

* Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

See ITS 3.3.2

~~TABLE 4.3-1 (Continued)~~

Logarithmic Neutron Flux Monitoring

~~REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

	FUNCTION~~AL UNIT~~	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	12. Reactor Trip Breakers	N.A.	N.A.	S/U(1), SFCP, SFCP(6)	1, 2, 3*, 4*, 5*	See ITS 3.3.2
SR 3.3.11.1 SR 3.3.11.2	13. ~~Wide Range~~ Logarithmic Neutron Flux Monitor	SFCP	SFCP	S/U(1), ~~SFCP~~	1, 2, 3, 4, 5	
	14. Reactor Coolant Flow – Low	SFCP	SFCP	SFCP	1, 2	See ITS 3.3.1
	15. Loss of Load (Turbine Hydraulic Fluid Pressure – Low)	SFCP	N.A.	SFCP	1	

Add proposed ITS SR 3.3.11.2 Note

L04

ADMINISTRATIVE CHANGES

A01 In the conversion of the St. Lucie Plant (PSL) Unit 1 and Unit 2 Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications – Combustion Engineering Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 specify requirements for reactor protective instrumentation and list the requirements for each functional unit in CTS Tables 3.3-1 and 4.3-1, including the Wide Range Logarithmic Neutron Flux Monitor – Shutdown instrumentation. ITS 3.3.11 provides requirements for Logarithmic Neutron Flux Monitoring and provides the requirements in the LCO, Applicability, ACTIONS, and Surveillance Requirements. This changes the CTS by presenting the instrument requirements without use of an instrument table. This change is acceptable as it results solely from the change in the format and presentation of the CTS necessary to conform to the ISTS. As the proposed change is the result of changes in the format and presentation of the CTS requirements, it is designated administrative.

A03 **Unit 2 only:** CTS 4.3.1.1 and Table 4.3-1, Functional Unit 13 (Wide Range Logarithmic Neutron Flux Monitor) require a CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and a CHANNEL CALIBRATION on a Frequency in accordance with the Surveillance Frequency Control Program (SFCP). ITS 3.3.11 only requires a CHANNEL CHECK and CHANNEL CALIBRATION and incorporates the CHANNEL FUNCTIONAL TEST into the CHANNEL CALIBRATION. This changes the CTS by incorporating the CHANNEL FUNCTIONAL TEST into the CHANNEL CALIBRATION requirement for the logarithmic neutron flux monitoring channels.

The purpose of the CHANNEL FUNCTIONAL TEST is to ensure components within the instrumentation circuitry are tested more frequently than a CHANNEL CALIBRATION due to the maximum calculated uncertainty of these components. The Frequency in accordance with the SFCP associated with the logarithmic neutron flux monitoring channels is 18 months for both the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION. The CTS 1.4 (ITS Section 1.1) definition for CHANNEL CALIBRATION states, in part: “The CHANNEL CALIBRATION shall encompass the entire channel… and shall include the CHANNEL FUNCTIONAL TEST.” Since the CHANNEL CALIBRATION encompasses the CHANNEL FUNCTIONAL TEST and the periodic Frequency for these Surveillances is equivalent when shutdown, it is unnecessary to present the CHANNEL FUNCTIONAL TEST as a separate test. This change is acceptable as it results solely in a format and presentation change to the CTS by incorporating the CHANNEL FUNCTIONAL TEST into the CHANNEL CALIBRATION. Both Surveillance Requirements are maintained in the ITS via the CHANNEL CALIBRATION (ITS SR 3.3.11.2). As the proposed change is the result of a change in the format and presentation of the CTS requirements and not a technical change, it is designated administrative.

MORE RESTRICTIVE CHANGES

M01 **Unit 1 only:** CTS Table 3.3-1 Action 3 provides actions for the Wide Range Logarithmic Neutron Flux Monitor – Shutdown Functional Unit (Functional Unit 11.b). Table 3.3-1, Action 3 requires verification of SHUTDOWN MARGIN (SDM) when the number of channels OPERABLE is one less than the required Minimum Channels Operable. ITS 3.3.11 ACTION A requires a similar action but also includes an additional action to immediately suspend all operations involving positive reactivity additions (Required Action A.1). The action includes a Note to allow limited plant cooldown or boron dilution activities provided the change is accounted for in the calculated SDM. This changes the CTS by adding an additional action when one or more required logarithmic neutron flux monitoring channels is inoperable when shutdown (i.e., MODES 3, 4, and 5).

The purpose of the additional required action is to eliminate many of the means by which SDM can be reduced, while allowing normal plant control operations (e.g., Reactor Coolant System inventory management and temperature control). This action is necessary because with one or more required logarithmic neutron flux monitoring channels inoperable, the ability to detect a boron dilution event is degraded. This change is designated as more restrictive because it provides an additional action requirement that is not required by the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 - Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 for reactor protective instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.11 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 **Unit 1 only:** (*Category 7- Relaxation of Surveillance Frequency*) CTS 4.3.1.1.1 and CTS Table 4.3-1 Functional Unit 11 (Wide Range Logarithmic Neutron Flux Monitor), require performance of a CHANNEL FUNCTIONAL TEST during startup if not performed in the previous 7 days in accordance with Table 4.3-1 Note (1). CTS does not require a CHANNEL CALIBRATION for the logarithmic neutron flux monitor channels. Performing the CHANNEL FUNCTIONAL TEST during startup if not performed in the previous 7 days would routinely equate to every 18 months if there was no other plant startup between refueling outages. The ITS does not require a CHANNEL FUNCTIONAL TEST "during startup if not performed in the previous 7 days," but rather, ITS SR 3.3.11.2 requires a CHANNEL CALIBRATION, which encompasses a CHANNEL FUNCTIONAL TEST, to be performed on a Frequency in accordance with the Surveillance Frequency Control Program (SFCP). A Note is included stating that the neutron detectors are excluded from the CHANNEL CALIBRATION. This changes the CTS by replacing the requirement to perform the CHANNEL FUNCTIONAL TEST during startup (routinely every 18 months) if not performed in the previous 7 days with a requirement to perform a CHANNEL CALIBRATION on a periodic frequency in accordance with the SFCP with an initial periodic Frequency of 18 months.

The purpose of the CTS Table 4.3-1 Functional Unit 11 CHANNEL FUNCTIONAL TEST is to ensure the logarithmic neutron flux monitoring channels are functioning properly. This change is acceptable because the CTS 1.4 (ITS Section) definition of a CHANNEL CALIBRATION encompasses a CHANNEL FUNCTIONAL TEST and also includes a complete check of the instrument channel and will continue to ensure the channels are functioning properly. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. The Note excluding the neutron detectors from the calibration is acceptable because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. CTS 4.0.4 (ITS SR 3.0.4) requires the normal periodic Surveillances to be performed and be current prior to entry into the applicable MODES. Once the applicable MODES are entered, the normal, periodic Surveillance Frequency provides adequate assurance of OPERABILITY. Performing the CHANNEL FUNCTIONAL TEST during startup if not performed in the previous 7 days, as specified in CTS Table 4.3-1 and Note (1) for Functional Unit 11, would routinely be every 18 months if there were no other plant startups between refueling outages. Therefore, replacing the specific Frequency of prior to startup if not performed in the previous 7 days with a specified Frequency of in accordance with the Surveillance Frequency Control Program with an initial periodic frequency of 18 months is considered acceptable.

Requiring a CHANNEL CALIBRATION instead of a CHANNEL FUNCTIONAL TEST is also acceptable because the CHANNEL CALIBRATION encompasses the CHANNEL FUNCTIONAL TEST as defined in Section 1.1 of the ITS.

PSL controls periodic Frequencies for Surveillances in accordance with the SFCP per CTS 6.8.4.o. Therefore, the initial periodic Frequency for SR 3.3.11.2 in accordance with the SFCP will be 18 months consistent with the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION testing frequencies for PSL Unit 2 CTS 4.3.1.1 and Table 4.3-1, Functional Unit 13; and ISTS SR 3.3.13.3. The periodic Frequency is acceptable based upon the assumption of a 22.5 month calibration interval (18 months plus 25% grace) for the determination of the magnitude of equipment drift and is consistent with the CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST Frequencies for the PSL Unit 2 wide range neutron monitoring instrumentation.

The SFCP was established as described in FPL (PSL Unit 1 and Unit 2) "Application for Technical Specification Change Regarding Risk-Informed Justifications for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program" (ADAMS Accession No. ML14070A087). The NRC issued Amendment No. 223 to Renewed Facility Operating License No. DPR-67 and Amendment No. 173 to Renewed Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively (ADAMS Accession No. ML15127A066). This change is designated as less restrictive because the Surveillance will be performed less frequently under the ITS than under the CTS.

L02 (*Category 1 – Relaxation of LCO Requirements*) Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 specify requirements for reactor protective instrumentation and list the requirements for each functional unit in CTS Tables 3.3-1 and 4.3-1, including the Wide Range Logarithmic Neutron Flux Monitor – Shutdown instrumentation. CTS Table 3.3-1 lists a total of 4 channels and requires a minimum of 2 channels to be OPERABLE for the Wide Range Logarithmic Neutron Flux Monitor – Shutdown Function (Functional Unit 11.b (Unit 1) and 13.b (Unit 2)). TS 3.3.11 provides requirements for Logarithmic Neutron Flux Monitoring and also requires two channels neutron flux monitoring channels to be OPERABLE when shutdown. The ITS 3.3.11 Bases describes the channels required to meet the LCO and states that the excore wide range logarithmic monitoring channels (i.e., post accident and Appendix R monitors) can be substituted for the wide range logarithmic power range channels. Additionally for Unit 2, the startup logarithmic monitoring channels can be substituted for the wide range logarithmic power range channels. This changes the CTS by explicitly stating in the ITS Bases that instruments other than the wide range logarithmic power range monitoring instruments can be used to meet the LCO. This change results in a total of six logarithmic neutron flux monitoring channels that may be used to meet the LCO for Unit 1 and a total of eight logarithmic neutron flux monitoring channels that may be used to meet the LCO for Unit 2.

The purpose of requiring the wide range logarithmic neutron flux monitors to be OPERABLE during MODES 3, 4, and 5 is to alert the operator of reactivity transients (e.g., boron dilution event) initiated from conditions in which the Reactor Protective System is not required. For Unit 1, the excore wide range logarithmic monitoring channels provide input into the boron dilution alarm and have a wide range of 2 X 10^{-8}% to 200%, which is equivalent to the wide range logarithmic power range channels, and a source range of 1 to 10^5 cps. For Unit 2, the excore wide range logarithmic monitoring channels also have a wide range of 2 X 10^{-8}% to 200%, which is equivalent to the wide range logarithmic power range channels, and a source range of 1 to 10^5 cps. However, separate startup logarithmic monitoring channels provide input to the boron dilution alarm for Unit 2. The startup logarithmic monitoring instruments have a source range of 1 to 10^5 cps. Specific neutron flux monitoring instruments are not assumed in shutdown accidents and transients. However, the timing for operators to take action to mitigate a boron dilution accident is evaluated for the shutdown modes and is based, in part, on alarms and indication of a reactivity increase. This change is acceptable because the excore wide range logarithmic monitoring channels have an instrument range equivalent to the wide range logarithmic power range channels and the Unit 1 excore wide range logarithmic monitoring channels and Unit 2 startup logarithmic monitoring channels provide input to the boron dilution alarm. Therefore, these logarithmic neutron flux monitoring instruments can also alert the operator of reactivity transients, including a boron dilution event, in MODES 3, 4, and 5. This change is designated as less restrictive because less stringent LCO requirements are being applied in ITS than were applied in the CTS.

L03 (*Category 3 - Relaxation of Completion Time*) CTS Table 3.3-1 Action 3 provides compensatory actions for the Wide Range Logarithmic Neutron Flux Monitor – Shutdown Functional Unit when the number of OPERABLE channels is less than the number of minimum required channels Operable. Action 3 requires verification of compliance with Shutdown Margin requirements within 1 hour and at least once per 12 hours thereafter. ITS Required Action A.2 specifies an equivalent action with a Completion Time of 4 hours and once per 12 hours thereafter. This changes the CTS by extending the time to initially verify SHUTDOWN MARGIN (SDM) from 1 hour to 4 hours.

The purpose of the action to verify compliance with SDM is to detect an inadvertent boron dilution of the Reactor Coolant System (RCS) providing operators with time to take action prior to a loss of SDM when the one or more required logarithmic neutron flux monitoring channels is inoperable. The proposed change is acceptable because the initial Completion Time of 4 hours to perform SDM verification takes into consideration that ITS 3.3.11, Required Action A.1 eliminates many of the means by which SDM can be reduced. In addition, the Completion Time extension is justified based on the low likelihood of an event occurring within the allowed Completion Time and the fact that plant conditions will change slowly. The proposed change is designated less restrictive as it results in additional time being allowed to perform a required action.

L04 **Unit 2 only:** *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.3.1.1 and Table 4.3-1, Functional Unit 13 (Wide Range Logarithmic Neutron Flux Monitor) require, in part, a CHANNEL CALIBRATION on a Frequency in accordance with the Surveillance Frequency Control Program (SFCP). ITS SR 3.3.11.2 also requires a CHANNEL CALIBRATION but is modified by a Note stating, “Neutron detectors are excluded from CHANNEL

CALIBRATION.". This changes the CTS by excluding neutron detectors from the CHANNEL CALIBRATION requirement for the logarithmic neutron flux monitoring channels.

The purpose of a CHANNEL CALIBRATION is to ensure that the channel responds within the necessary range and accuracy to known values of the parameter that the channel monitors. Thus, to perform a channel calibration of a neutron flux channel would require including the neutron flux detector in the calibration. Inclusion of neutron flux detectors in the CHANNEL CALIBRATION process is impractical in power reactor applications because to do so would require subjecting the detectors to known neutron fluxes. Neutron detectors are typically excluded from CHANNEL CALIBRATIONS because of the hazards associated with exposing the neutron detectors; for example, CTS Table 4.3-1 Note (4) excludes the detectors of Functional Unit 2 (Variable Power Level High) from CHANNEL CALIBRATION. The logarithmic neutron flux monitoring channels also use neutron detectors, which are subject to the same hazards. The Note excluding the neutron detectors from the calibration is acceptable because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. This proposed change is consistent with historical and current NRC staff requirements as reflected in ISTS. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.1~~3~~ 1 ~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring ~~Channels (Analog)~~ 1 2 3

Table 3.3-1 Functional Unit 11.a DOC L02

LCO 3.3.1~~3~~ 1 Two ~~channels of [~~logarithmic~~]~~ ~~power level monitoring instrumentation~~ neutron flux monitoring channels shall be OPERABLE. 1 2 3

Applicability

APPLICABILITY: MODES 3, 4, and 5~~, with the reactor trip circuit breakers open or Control Element Assembly (CEA) Drive System not capable of CEA withdrawal~~. 4

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
DOC M01 A. One or more required channel(s) inoperable.	A.1	---------------NOTE-------------- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. ------------------------------------- Suspend all operations involving positive reactivity additions.	Immediately
	AND		
Table 3.3-1 Action 3 DOC L03	A.2	Perform SDM verification in accordance with SR 3.1.1.1.	4 hours AND Once per 12 hours thereafter

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
Table 4.3-1 Functional Unit 11	SR 3.3.1~~3~~.1 1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 3 3
DOC L01	~~SR 3.3.13.2~~	~~Perform CHANNEL FUNCTIONAL TEST.~~	~~[[92] days~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	5
DOC L01	SR 3.3.1~~3.3~~ 1.2	-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 5 3 3

CTS

3.3 INSTRUMENTATION ~~(Analog)~~

3.3.1~~3~~ 1 ~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring ~~Channels (Analog)~~ 1 2 3

Table 3.3-1 Functional Unit 13.b DOC L02 LCO 3.3.1~~3~~ 1 Two ~~channels of [~~logarithmic~~]~~ ~~power level monitoring instrumentation~~ neutron flux monitoring channels shall be OPERABLE. 1 2 3

Applicability APPLICABILITY: MODES 3, 4, and 5~~, with the reactor trip circuit breakers open or Control Element Assembly (CEA) Drive System not capable of CEA withdrawal~~. 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channel(s) inoperable.	A.1 ---------------NOTE-------------- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. -------------------------------------	
	Suspend all operations involving positive reactivity additions.	Immediately
	AND	
	A.2 Perform SDM verification in accordance with SR 3.1.1.1.	4 hours AND Once per 12 hours thereafter

Table 3.3-1 Action 3 (margin annotation for Condition A)

DOC L03 (margin annotation for A.2)

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
Table 4.3-1 Functional Unit 13	SR 3.3.1~~3~~.1 (1) Perform CHANNEL CHECK.	~~[12 hours~~ 2 3 ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ 3
DOC A03	~~SR 3.3.13.2 Perform CHANNEL FUNCTIONAL TEST.~~	~~[[92] days~~ 5 ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~
DOC L04 Table 4.3-1 Functional Unit 13 DOC A03	SR 3.3.1~~3.3~~ (1.2) ------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	2 5 ~~[[18] months~~ 3 ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.11, LOGARITHMIC NEUTRON FLUX MONITORING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The heading for ISTS 3.3.11 includes the parenthetical expression (Analog). This identifying information is not included in the PSL ITS. This information is provided in the NUREG-1432, Rev. 5.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion but serves no purpose in a plant-specific implementation. In addition, PSL design does not include the Reactor Protective System (RPS) Instrumentation – Shutdown (ISTS 3.3.2) and Chemical and Volume Control System (CVCS) Isolation Signal (ISTS 3.3.9). Therefore, ISTS 3.3.2 and ISTS 3.3.9 are not included in the PSL ITS. The successive Specifications are renumbered as necessary.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The specified condition in the Applicability of ISTS 3.3.13 state states, “with the reactor trip circuit breakers open or Control Element Assembly (CEA) Drive System not capable of CEA withdrawal,” is not included in ITS 3.3.11. The ITS Applicability of MODES 3, 4, and 5 is consistent with the Applicable Mode in PSL CTS Table 3.3-1 for Functional Unit 11.b (Unit 1) and 13.b (Unit 2) and ensures capability to detect a boron dilution event while shutdown is available regardless of the status of the reactor trip circuit breakers.

5. ISTS 3.3.13.2 is not included in the PSL ITS. In the PSL Unit 2 CTS, the Frequency for the CHANNEL FUNCTIONAL TEST and the CHANNEL CALIBRATION is 18 months in accordance with the Surveillance Frequency Control Program. The definition for CHANNEL CALIBRATION in Section 1.1 states, in part, that the CHANNEL CALIBRATION encompasses the CHANNEL FUNCTIONAL TEST. Therefore, it is unnecessary to provide two separate requirements. This change is also made to PSL Unit 1 to be consistent with PSL Unit 2 since the instrumentation calibration tolerance is the same for both units. Refer to CTS Discussion of Change A03 for Unit 2 and L01 for Unit 1. The successive SR is renumbered to reflect this change.

Improved Standard Technical Specifications (ISTS) Bases Markup and Justification for Deviations (JFDs)

B 3.3 INSTRUMENTATION ~~(Analog)~~ 1 3

B 3.3.1~~3~~ ~~[~~Logarithmic~~]~~ ~~Power~~ Monitoring ~~Channels (Analog)~~ 2

1 Neutron Flux

2E-8% RTP to 200% RTP

BASES

wide range neutron flux

BACKGROUND

The ~~[~~logarithmic~~]~~ ~~power~~ monitoring channels provide neutron flux power indication from ~~< 1E-7% RTP to > 100% RTP~~. They also provide reactor protection when the reactor trip circuit breakers (RTCBs) are shut, in the form of a Power Rate of Change - High trip ~~(analog plants) or a [Logarithmic] Power Level - High trip (digital plants)~~. 3

1 wide range neutron flux In MODES 1 and 2 1

This LCO addresses MODES 3, 4, and 5 ~~with the RTCBs open~~. ~~When the RTCBs are shut~~, the ~~[~~logarithmic~~]~~ ~~power~~ monitoring channels are addressed by LCO 3.3.~~2~~, "Reactor Protective System (RPS) Instrumentation - ~~Shutdown~~." 3

Operating

wide range logarithmic neutron flux instrument inputs to the Power Rate of Change – High reactor trip function

~~When the RTCBs are open, two of the four wide range power channels must be available to monitor neutron flux power.~~ In this application, the RPS ~~channels~~ need not be OPERABLE since the reactor trip Function is not required~~.~~ ~~By~~ monitoring neutron flux power ~~when the RTCBs are open~~, loss of SDM caused by boron dilution can be detected as an increase in flux. ~~Alarms are also provided when power increases above the fixed bistable setpoints. For plants employing separate post accident, [logarithmic] nuclear instrumentation channels with adequate range, these can be substituted for the [logarithmic] power range channels.~~ Two channels must be OPERABLE to provide single failure protection and to facilitate detection of channel failure by providing CHANNEL CHECK capability.

Insert 1

Insert 2

in MODES 3, 4, and 5

1

APPLICABLE SAFETY ANALYSES

neutron flux

The ~~[~~logarithmic~~]~~ ~~power~~ monitoring channels are necessary to monitor core reactivity changes. They are the primary means for detecting and triggering operator actions to respond to reactivity transients initiated from conditions in which the RPS is not required to be OPERABLE. ~~They also trigger operator actions to anticipate RPS actuation in the event of reactivity transients starting from shutdown or low power conditions.~~ The ~~[~~logarithmic~~]~~ ~~power~~ monitoring channel's LCO requirements support compliance with 10 CFR 50, Appendix A, GDC 13 (Ref. 1). The FSAR, Chapters ~~[~~7~~]~~ and ~~[~~15~~]~~ (Refs. 2 and 3, respectively), describes the specific ~~[~~logarithmic~~]~~ ~~power~~ monitoring channel features ~~that are critical to comply with the GDC~~. 1 3

neutron flux 1 1 3 U 1 3

neutron flux

neutron flux

The OPERABILITY of ~~[~~logarithmic~~]~~ ~~power~~ monitoring channels is necessary to ~~meet the assumptions of the safety analyses and provide for the mitigation of accident and transient conditions~~. 1 3

alert the operator of a boron dilution event and other postulated reactivity transients while shutdown

neutron flux

The ~~[~~logarithmic~~]~~ ~~power~~ monitoring channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1 3

Insert 1

1

in MODES 3, 4, and 5. The manual reactor trip Function is required in MODES 3, 4, and 5 with any reactor trip circuit breaker (RTCB) closed and any control element assemblies (CEA) capable of being withdrawn. However, by

Insert 2

2

The excore wide range logarithmic monitoring channels (i.e., post accident / Appendix R monitors) can be substituted for the wide range logarithmic power range channels. The excore wide range logarithmic monitoring instruments include fission detectors and have a wide range of 2 X 10^{-8}% to 200% RTP and a source range of 1 to 10^{5} cps. The boron dilution alarm channels utilize the excore wide range logarithmic monitoring channels, which subsequently provide an alarm signal to the plant annunciation system upon detection of a dilution event.

BASES

LCO

neutron flux

The LCO on the [logarithmic] ~~power~~ monitoring channels ensures that adequate information is available to verify core reactivity conditions while shut down. 3

neutron flux

A minimum of two [logarithmic] ~~power~~ monitoring channels are required to be OPERABLE. ~~Some plants may have either four or~~ six channels capable of performing this function. ~~In these cases,~~ multiple failures may be tolerated while ~~the plants are still~~ complying with LCO requirements. 3 1

are

APPLICABILITY

In MODES 3, 4, and 5, ~~with RTCBs open or the Control Element Assembly (CEA) Drive System not capable of CEA withdrawal,~~ [logarithmic] ~~power~~ monitoring channels must be OPERABLE to monitor core power for reactivity changes. In MODES 1 and 2, ~~and in MODES 3, 4, and 5 with the RTCBs shut and the CEAs capable of withdrawal,~~ the [logarithmic] ~~power~~ monitoring channels are addressed as part of the RPS in LCO 3.3.1, "Reactor Protective System (RPS) Instrumentation - Operating." 3 1

neutron flux

wide range

In MODES 3, 4, and 5 with any RTCB closed and any CEA capable of being withdrawn, manual reactor trip channels are required and addressed by LCO 3.3.2, "Reactor Protection System (RPS) Logic and Trip Initiation."

The requirements for source range neutron flux monitoring in MODE 6 are addressed in LCO 3.9.2, "Nuclear Instrumentation." The source range nuclear instrumentation channels provide neutron flux coverage ~~extending an additional one to two decades below the [logarithmic] channels for use~~ during refueling, when neutron flux may be extremely low. ~~They are built into the [logarithmic] neutron flux channels in the analog plants and in many of the post accident channels used in both the digital and analog plants.~~ 3 1

ACTIONS

<u>A.1 and A.2</u>

With one required channel inoperable, it may not be possible to perform a CHANNEL CHECK to verify that the other required channel is OPERABLE. Therefore, with one or more required channels inoperable, the [logarithmic] ~~power~~ monitoring Function cannot be reliably performed. Consequently, the Required Actions are the same for one required channel inoperable or more than one required channel inoperable. ~~The absence of reliable neutron flux indication makes it difficult to ensure SDM is maintained.~~ Required Action [A.1] is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM. 3 1 1 3

neutron flux

BASES

ACTIONS (continued)

SDM must be verified periodically to ensure that it is being maintained. Both required channels must be restored as soon as possible. The initial Completion Time of 4 hours and once every 12 hours thereafter to perform SDM verification takes into consideration that Required Action A.1 eliminates many of the means by which SDM can be reduced. These Completion Times are also based on operating experience in performing the Required Actions and the fact that plant conditions will change slowly.

SURVEILLANCE REQUIREMENTS

SR 3.3.1~~3~~.1 1 2

SR 3.3.1~~3~~.1 is the performance of a CHANNEL CHECK on each required channel. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based upon 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff and should be based on a combination of the channel instrument uncertainties including control isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limits. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

~~SR 3.3.13.2~~

~~A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel is capable of properly indicating neutron flux. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Internal test circuitry is used to feed preadjusted test signals into the preamplifier to verify channel alignment. It is not necessary to test the detector, because generating a meaningful test signal is difficult; the detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output. [The Frequency of 92 days is the same as that employed for the same channels in the other applicable MODES.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

~~[At this unit, the channel trip Functions tested by the CHANNEL FUNCTIONAL TEST are as follows:]~~

~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1~~3.3~~ 2 5

1.2 neutron flux 1

SR 3.3.1~~3.3~~ is the performance of a CHANNEL CALIBRATION. A CHANNEL CALIBRATION is performed. The Surveillance is a complete check and readjustment of the ~~[~~logarithmic~~]~~ ~~power~~ channel from the preamplifier input through to the remote indicators. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves ~~-~~the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. ~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.~~ 1 3 1

Consistent with the definition of a CHANNEL CALIBRATION, this SR encompasses a CHANNEL FUNCTIONAL TEST.

This SR is modified by a Note to indicate that it is not necessary to test the detector because generating a meaningful test signal is difficult; the detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output. ~~[The Frequency of 18 months is the same as that employed for the same channels in the other applicable MODES.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~---]~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13.
2. FSAR, Chapter ~~[~~7~~]~~. 1
3. FSAR, Chapter ~~[~~15~~]~~. 3

U

B 3.3 INSTRUMENTATION ~~(Analog)~~ 1 3

B 3.3.1~~3~~ 1 ~~[~~Logarithmic~~]~~ ~~Power~~ Neutron Flux Monitoring Channels ~~(Analog)~~ 2

BASES

BACKGROUND

The wide range ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channels provide neutron flux power indication from ~~≤ 1E-7% RTP to ≥ 100% RTP~~ 2E-8% RTP to 200% RTP. They also provide reactor protection when the reactor trip circuit breakers (RTCBs) are shut, in the form of a Power Rate of Change - High trip ~~(analog plants) or a [Logarithmic] Power Level - High trip (digital plants)~~. 3

1

This LCO addresses MODES 3, 4, and 5 ~~with the RTCBs open~~. ~~When the RTCBs are shut~~ In MODES 1 and 2, the ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channels are addressed by LCO 3.3.1~~2~~, "Reactor Protective System (RPS) Instrumentation - ~~Shutdown~~ Operating." 1 3

~~When the RTCBs are open, two of the four wide range power channels must be available to monitor neutron flux power.~~ In this application, the RPS wide range logarithmic neutron flux instrument inputs to the Power Rate of Change – High reactor trip function ~~channels~~ need not be OPERABLE since the reactor trip Function is not required~~.~~ Insert 1 ~~By~~ monitoring neutron flux power ~~when the RTCBs are open~~ in MODES 3, 4, and 5, loss of SDM caused by boron dilution can be detected as an increase in flux. ~~Alarms are also provided when power increases above the fixed bistable setpoints. For plants employing separate post accident, [logarithmic] nuclear instrumentation channels with adequate range, these can be substituted for the [logarithmic] power range channels.~~ Insert 2 Two channels must be OPERABLE to provide single failure protection and to facilitate detection of channel failure by providing CHANNEL CHECK capability. 1

APPLICABLE SAFETY ANALYSES

The ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channels are necessary to monitor core reactivity changes. They are the primary means for detecting and triggering operator actions to respond to reactivity transients initiated from conditions in which the RPS is not required to be OPERABLE. ~~They also trigger operator actions to anticipate RPS actuation in the event of reactivity transients starting from shutdown or low power conditions.~~ The ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channel's LCO requirements support compliance with 10 CFR 50, Appendix A, GDC 13 (Ref. 1). The U FSAR, Chapters ~~[~~7~~]~~ and ~~[~~15~~]~~ (Refs. 2 and 3, respectively), describes the specific ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channel features ~~that are critical to comply with the GDC~~. 1 3 1 1 3 1 3

The OPERABILITY of ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channels is necessary to ~~meet the assumptions of the safety analyses and provide for the mitigation of accident and transient conditions~~ alert the operator of a boron dilution event and other postulated reactivity transients while shutdown. 1 3

The ~~[~~logarithmic~~]~~ ~~power~~ neutron flux monitoring channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1 3

Insert 1 1

in MODES 3, 4, and 5. The manual reactor trip Function is required in MODES 3, 4, and 5 with any reactor trip circuit breaker (RTCB) closed and any control element assemblies (CEA) capable of being withdrawn. However, by

Insert 2 2

The excore wide range logarithmic monitoring channels (i.e., post accident / Appendix R monitors) and the startup logarithmic monitoring channels can be substituted for the wide range logarithmic power range channels. The excore wide range logarithmic monitoring instruments include fission detectors and have a wide range of 2 X 10^{-8}% to 200% RTP and a source range of 1 to 10^5 cps. The startup logarithmic monitoring instruments include BF3 detectors and have a range of 1 to 10^5 cps. The boron dilution alarm channels utilize the startup logarithmic monitoring channels, which subsequently provide an alarm signal to the plant annunciation system upon detection of a dilution event.

BASES

LCO

The LCO on the ~~[~~logarithmic~~] power~~ neutron flux monitoring channels ensures that adequate information is available to verify core reactivity conditions while shut down.

A minimum of two ~~[~~logarithmic~~] power~~ neutron flux monitoring channels are required to be OPERABLE. ~~Some plants may have either four or six~~ Eight channels are capable of performing this function. ~~In these cases, m~~Multiple failures may be tolerated while ~~the plants are still~~ complying with LCO requirements.

APPLICABILITY

In MODES 3, 4, and 5, ~~with RTCBs open or the Control Element Assembly (CEA) Drive System not capable of CEA withdrawal,~~ ~~[~~logarithmic~~] power~~ neutron flux monitoring channels must be OPERABLE to monitor core power for reactivity changes. In MODES 1 and 2, ~~and in MODES 3, 4, and 5 with the RTCBs shut and the CEAs capable of withdrawal,~~ the ~~[~~logarithmic~~] power~~ monitoring channels are addressed as part of the RPS in LCO 3.3.1, "Reactor Protective System (RPS) Instrumentation - Operating." In MODES 3, 4, and 5 with any RTCB closed and any CEA capable of being withdrawn, manual reactor trip channels are required and addressed by LCO 3.3.2, "Reactor Protection System (RPS) Logic and Trip Initiation."

The requirements for source range neutron flux monitoring in MODE 6 are addressed in LCO 3.9.2, "Nuclear Instrumentation." The source range nuclear instrumentation channels provide neutron flux coverage ~~extending an additional one to two decades below the [logarithmic] channels for use~~ during refueling, when neutron flux may be extremely low. ~~They are built into the [logarithmic] neutron flux channels in the analog plants and in many of the post accident channels used in both the digital and analog plants.~~

ACTIONS

A.1 and A.2

With one required channel inoperable, it may not be possible to perform a CHANNEL CHECK to verify that the other required channel is OPERABLE. Therefore, with one or more required channels inoperable, the ~~[~~logarithmic~~] power~~ neutron flux monitoring Function cannot be reliably performed. Consequently, the Required Actions are the same for one required channel inoperable or more than one required channel inoperable. ~~The absence of reliable neutron flux indication makes it difficult to ensure SDM is maintained.~~ Required Action ~~[~~A.1~~]~~ is modified by a Note to indicate that normal plant control operations that individually add limited positive reactivity (e.g., temperature or boron fluctuations associated with RCS inventory management or temperature control) are not precluded by this Action, provided they are accounted for in the calculated SDM.

BASES

ACTIONS (continued)

SDM must be verified periodically to ensure that it is being maintained. Both required channels must be restored as soon as possible. The initial Completion Time of 4 hours and once every 12 hours thereafter to perform SDM verification takes into consideration that Required Action A.1 eliminates many of the means by which SDM can be reduced. These Completion Times are also based on operating experience in performing the Required Actions and the fact that plant conditions will change slowly.

SURVEILLANCE REQUIREMENTS

SR 3.3.1~~3~~.1 1 2

SR 3.3.1~~3~~.1 is the performance of a CHANNEL CHECK on each required channel. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based upon 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 of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff and should be based on a combination of the channel instrument uncertainties including control isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limits. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of displays associated with the LCO required channels.~~ 3

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 4

~~SR 3.3.13.2~~

~~A CHANNEL FUNCTIONAL TEST is performed to ensure that the entire channel is capable of properly indicating neutron flux. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Internal test circuitry is used to feed preadjusted test signals into the preamplifier to verify channel alignment. It is not necessary to test the detector, because generating a meaningful test signal is difficult; the detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output. [The Frequency of 92 days is the same as that employed for the same channels in the other applicable MODES.~~

~~OR~~ 5

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~

~~[At this unit, the channel trip Functions tested by the CHANNEL FUNCTIONAL TEST are as follows:]~~

~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1~~3.3~~1.2

SR 3.3.1~~3.3~~1.2 is the performance of a CHANNEL CALIBRATION. A CHANNEL CALIBRATION is performed. The Surveillance is a complete check and readjustment of the ~~[~~logarithmic~~]~~ ~~power~~ neutron flux channel from the preamplifier input through to the remote indicators. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. ~~There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.~~ Consistent with the definition of a CHANNEL CALIBRATION, this SR encompasses a CHANNEL FUNCTIONAL TEST.

This SR is modified by a Note to indicate that it is not necessary to test the detector because generating a meaningful test signal is difficult; the detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output. ~~[The Frequency of 18 months is the same as that employed for the same channels in the other applicable MODES.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

REFERENCES

1. 10 CFR 50, Appendix A, GDC 13.
2. UFSAR, Chapter ~~[~~7~~]~~.
3. UFSAR, Chapter ~~[~~15~~]~~.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.11 BASES, LOGARITHMIC NEUTRON FLUX MONITORING

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes are made to reflect the ITS Specification number and title. Numbering is changed from 3.3.13 to 3.3.11 and “(Analog)” is deleted from the title.

3. The ISTS contains bracketed information and/or values that are generic to Combustion Engineering vintage plants. The brackets are removed and the proper plant information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. ISTS SR 3.3.13.2 Bases discussion is not included in the ITS to reflect the changes to the Specification in the ITS. The successive SR is renumbered to reflect this change.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.11, LOGARITHMIC NEUTRON FLUX MONITORING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 12

ISTS Not Adopted

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

~~3.3 INSTRUMENTATION (Analog)~~

~~3.3.2 Reactor Protective System (RPS) Instrumentation - Shutdown (Analog)~~

~~LCO 3.3.2~~ ~~Four Power Rate of Change - High RPS trip units and associated instrument and bypass removal channels shall be OPERABLE.~~

~~APPLICABILITY:~~ ~~MODES 3, 4, and 5, with any reactor trip circuit breakers (RTCBs) closed and any control element assembly capable of being withdrawn.~~

~~-----NOTE-----~~
~~Trip may be bypassed when THERMAL POWER is < [1E-4]% RTP. Bypass shall be automatically removed when THERMAL POWER is ≥ [1E-4]% RTP.~~
~~----------~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One Power Rate of Change - High trip unit or associated instrument channel inoperable.~~	~~A.1 Place affected trip unit in bypass or trip.~~	~~1 hour~~
	~~AND~~	
	~~A.2.1 Restore channel to OPERABLE status.~~	~~[48] hours~~
	~~OR~~	
	~~A.2.2 [Place affected trip unit in trip.~~	~~48 hours]~~

~~ACTIONS (continued)~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~B. Two Power Rate of Change - High trip units or associated instrument channel inoperable.~~	~~B.1 Place one trip unit in bypass and place the other trip unit in trip.~~	~~1 hour~~
	~~AND~~	
	~~B.2 [Restore one trip unit to OPERABLE status.~~	~~48 hours]~~
~~C. One automatic bypass removal channel inoperable.~~	~~C.1 Disable bypass channel.~~	~~1 hour~~
	~~OR~~	
	~~C.2.1 Place affected trip unit in bypass or trip.~~	~~1 hour~~
	~~AND~~	
	~~C.2.2.1 Restore bypass removal channel and affected trip unit to OPERABLE status.~~	~~[48] hours~~
	~~OR~~	
	~~C.2.2.2 [Place affected trip units in trip.~~	~~48 hours]~~
~~D. Two automatic bypass removal channels inoperable.~~	~~D.1 Disable bypass channels.~~	~~1 hour~~
	~~OR~~	
	~~D.2.1 Place one affected trip unit in bypass and place the other in trip.~~	~~1 hour~~
	~~AND~~	

~~ACTIONS (continued)~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
	~~D.2.2 Restore one bypass channel and the associated trip unit to OPERABLE status.~~	~~[48] hours~~
~~E. Required Action and associated Completion Time not met.~~	~~E.1 Open all RTCBs.~~	~~6 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.3.2.1~~	~~Perform a CHANNEL CHECK of each wide range power channel.~~	~~[12 hours~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~
~~SR 3.3.2.2~~	~~Perform a CHANNEL FUNCTIONAL TEST on the Power Rate of Change trip function.~~	~~[92 days~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.3.2.3~~	~~Perform a CHANNEL FUNCTIONAL TEST on each automatic bypass removal function.~~	~~[92 days~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~
~~SR 3.3.2.4~~	~~-----------------------------NOTE-----------------------------~~ ~~Neutron detectors are excluded from CHANNEL CALIBRATION.~~ ~~---~~ ~~Perform a CHANNEL CALIBRATION, including bypass removal functions with Allowable Value ≤ [2.6] dpm.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.2, REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION - SHUTDOWN (ANALOG)

1. ISTS 3.3.2, "Reactor Protective System (RPS) Instrumentation - Shutdown (Analog)," Specification is not included in the St. Lucie Plant (PSL) Unit 1 and Unit 2 ITS because the RPS Rate of Change trip function is not credited in any UFSAR Chapter 15 accident analysis. Monitoring of the function is addressed by ITS 3.3.11, “Logarithmic Neutron Flux Monitoring.”

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

~~B 3.3 INSTRUMENTATION (Analog)~~

~~B 3.3.2 Reactor Protective System (RPS) Instrumentation - Shutdown (Analog)~~

~~BASES~~

~~BACKGROUND~~

~~The RPS initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and reactor coolant pressure boundary integrity during anticipated operational occurrences (AOOs). By tripping the reactor, the RPS also assists the Engineered Safety Features systems in mitigating accidents.~~

~~The protection and monitoring systems 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, defined in this Specification as the Allowable Value, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits during Design Basis Accidents.~~

~~During AOOs, which are those events expected to occur one or more times during the plant life, the acceptable limits are:~~

- ~~The departure from nucleate boiling ratio shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling,~~
- ~~Fuel centerline melting shall not occur, and~~
- ~~The Reactor Coolant System pressure SL of [2750] psia shall not be exceeded.~~

~~Maintaining the parameters within the above values ensures that the offsite dose will be within the 10 CFR 50 (Ref. 1) and 10 CFR 100 (Ref. 2) criteria during AOOs.~~

~~Accidents are events that are analyzed even though they are not expected to occur during the plant life. The acceptable limit during accidents is that the offsite dose shall be maintained within an acceptable fraction of 10 CFR 100 (Ref. 2) limits. Different accident categories allow a different fraction of these limits based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event.~~

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~~BASES~~

~~BACKGROUND (continued)~~

~~The RPS is segmented into four interconnected modules. These modules are:~~

- ~~Measurement channels,~~
- ~~Bistable trip units,~~
- ~~RPS Logic, and~~
- ~~Reactor trip circuit breakers (RTCBs).~~

~~This LCO applies only to the Power Rate of Change - High trip Functions and associated instrument channels in MODES 3, 4, and 5 with any of the RTCBs closed and any Control Element Assembly (CEA) capable of being withdrawn. In MODES 1 and 2, this trip Function is addressed in LCO 3.3.1, "Reactor Protective System (RPS) Instrumentation - Operating." LCO 3.3.13, "[Logarithmic] Power Monitoring Channels," applies when the RTCBs are open or CEA Drive System is not capable of CEA withdrawal. In the case of LCO 3.3.13, the logarithmic power instrumentation channels are required for monitoring neutron flux, although the trip Function is not required.~~

~~Measurement Channels and Trip Units~~

~~The measurement channels providing input to the Power Rate of Change - High Function consist of wide range nuclear instrumentation channels using neutron flux leakage from the reactor vessel.~~

~~Other aspects of the Power Rate of Change - High trip are similar to the other measurement channels and bistable trip units. These are addressed in the Background section of LCO 3.3.1.~~

~~APPLICABLE SAFETY ANALYSES~~

~~Each of the analyzed accidents and transients can be detected by one or more RPS Functions. The accident analysis contained in Reference 3 takes credit for most RPS trip Functions. Functions not specifically credited in the accident analysis were qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the plant. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. Other Functions, such as the Loss of Load trip, are purely equipment protective, and their use minimizes the potential for equipment damage.~~

~~BASES~~

~~APPLICABLE SAFETY ANALYSES (continued)~~

~~The Power Rate of Change - High trip is used to trip the reactor when excore wide range power indicates an excessive rate of change.~~

~~The Power Rate of Change - High trip is not required for protection. It serves as a backup to the administratively enforced startup rate limit.~~

~~The Power Rate of Change - High Function minimizes transients for events such as a continuous CEA withdrawal or a boron dilution event from low power levels. The Power Rate of Change - High trip is automatically bypassed at < 1E-4% RTP, as sensed by the wide range nuclear instrument (NI) Level 2 bistable, when poor counting statistics may lead to erroneous indication. It is also bypassed at > 12% RTP, where moderator temperature coefficient and fuel temperature coefficient make high rate of change of power unlikely. This bypass is effected by the power range NI Level 1 bistable. Automatic bypass removal is also effected by these bistables. With the RTCBs open, the Power Rate of Change - High trip is not required to be OPERABLE; however, the indication and alarm Functions of at least two channels are required to be OPERABLE. LCO 3.3.13 ensures the wide range channels are available to detect and alert the operator to a boron dilution event.~~

~~The RPS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).~~

~~LCO~~

~~The LCO requires all instrumentation performing an RPS Function to be OPERABLE. Failure of any required portion of the instrument channel or bypass removal channel renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.~~

~~Actions allow maintenance (trip channel) bypass of individual channels, but the bypass activates interlocks that prevent operation with a second channel in the same Function bypassed. Plants are restricted to 48 hours in a trip channel bypass condition before either restoring the Function to four channel operation (two-out-of-four logic) or placing the channel in trip (one-out-of-three logic). At plants where adequate channel to channel independence has been demonstrated, specific exceptions have been approved by the NRC staff to permit one of the two-out-of-four channels to be bypassed for an extended period of time.~~

~~This LCO requires four channels of Power Rate of Change - High to be OPERABLE in MODES 3, 4, and 5, when the RTCBs are closed and the CEA Drive System is capable of CEA withdrawal. MODE 1 and 2 requirements are addressed in LCO 3.3.1. This trip is not credited in the safety analysis. Therefore, the Allowable Value specified in SR 3.3.4.2 is not derived from an analytical limit.~~

~~BASES~~

~~APPLICABILITY~~

~~This LCO is applicable to the Power Rate of Change - High reactor trip in MODES 3, 4 and 5. MODES 1 and 2 are addressed in LCO 3.3.1.~~

~~The power rate of change trip is required in MODES 3, 4, and 5, with the RTCBs closed and a CEA capable of being withdrawn to provide backup protection for boron dilution and CEA withdrawal events. The power rate of change trip is not credited in the safety analysis, but is part of the NRC approved licensing basis for the plant.~~

~~The power rate of change trip has operating bypasses discussed in the LCO section. In MODES 3, 4, and 5, the emphasis is placed on return to power events. The reactor is protected in these MODES by ensuring adequate SDM.~~

~~ACTIONS~~

~~The most common causes of channel inoperability are outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST when the process instrument is set up for adjustment to bring it to within specification. If the trip setpoint is less conservative than the Allowable Value in Table 3.3.1-1, the channel is declared inoperable immediately, and the appropriate Condition(s) must be entered immediately.~~

~~In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument loop, signal processing electronics, or RPS bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the plant must enter the Condition for the particular protection Function affected.~~

~~When the number of inoperable channels in a trip Function exceeds that specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 is immediately entered if applicable in the current MODE of operation.~~

~~A.1, A.2.1, and A.2.2~~

~~Condition A applies to the failure of a single channel of the Power Rate of Change - High RPS automatic trip Function.~~

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~~BASES~~

~~ACTIONS (continued)~~

~~RPS coincidence logic is normally two-out-of-four. If one RPS bistable trip unit or associated instrument channel is inoperable, startup or power operation is allowed to continue, providing the inoperable trip unit is placed in bypass or trip within 1 hour (Required Action A.1). With one channel in bypass, no additional random failure of a single channel could spuriously trip the reactor and a valid trip signal can still trip the reactor. With one channel in trip, an additional random failure of a single channel could spuriously trip the reactor. Therefore, it is preferable to place an inoperable channel in bypass rather than trip.~~

~~The Completion Time of 1 hour allotted to restore, bypass, or trip the channel is sufficient to allow the operator to take all appropriate actions for the failed channel, while ensuring that the risk involved in operating with the failed channel is acceptable.~~

~~For plants that have not demonstrated sufficient channel to channel independence, the failed channel is restored to OPERABLE status or is placed in trip within 48 hours (Required Action A.2.1 or Required Action A.2.2). Required Action A.2.1 restores the full capability of the Function. Required Action A.2.2 places the Function in a one-out-of-three configuration. In this configuration, common cause failure of dependent channels cannot prevent trip.~~

~~The [48] hour Completion Time is based on operating experience, which has demonstrated that a random failure of a second channel occurring during the [48] hour period is a low probability event.~~

~~B.1 and B.2~~

~~Condition B applies to the failure of two channels in the Power Rate of Change - High RPS automatic trip Function.~~

~~Required Action B.1 provides for placing one inoperable channel in bypass and the other channel in trip within the Completion Time of 1 hour. This Completion Time is sufficient to allow the operator to take all appropriate actions for the failed channels, while ensuring the risk involved in operating with the failed channels is acceptable. With one channel of protective instrumentation bypassed, the RPS is in a two-out-of-three logic; but with another channel failed, the RPS may be operating in a two-out-of-two logic. This is outside the assumptions made in the analyses and should be corrected. To correct the problem, the second channel is placed in trip. This places the RPS in a one-out-of-two logic. If any of the other OPERABLE channels receives a trip signal, the reactor will trip.~~

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~~BASES~~

~~ACTIONS (continued)~~

~~[The bypassed channel should be restored to OPERABLE status within 48 hours for reasons similar to those stated under Condition A. After one channel is restored to OPERABLE status, the provisions of Condition A still apply to the remaining inoperable channel. Therefore, the channel that is still inoperable after completion of Required Action B.2 shall be placed in trip if more than 48 hours have elapsed since the initial channel failure.]~~

~~C.1, C.2.1, C.2.2.1, and C.2.2.2~~

~~Condition C applies to one automatic bypass removal channel inoperable. If the bypass removal channel cannot be restored to OPERABLE status, the associated Power Rate of Change - High RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected RPS channel must be declared inoperable, as in Condition A, and the bypass either removed or the bypass removal channel repaired. The Bases for the Required Actions and Completion Times are the same as discussed for Condition A.~~

~~D.1, D.2.1, and D.2.2~~

~~Condition D applies to two inoperable automatic bypass removal channels. If the bypass removal channels cannot be restored to OPERABLE status, the associated Power Rate of Change - High RPS channel may be considered OPERABLE only if the bypass is not in effect. Otherwise, the affected RPS channels must be declared inoperable, as in Condition B, and the bypass either removed or the bypass removal channel repaired. Also, Required Action D.2.2 provides for the restoration of the one affected automatic trip channel to OPERABLE status within the rules of Completion Time specified under Condition B. Completion Times are consistent with Condition B.~~

~~E.1~~

~~Condition E is entered when the Required Actions and associated Completion Times of Condition A, B, C, or D are not met.~~

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~~BASES~~

~~ACTIONS (continued)~~

~~If Required Actions associated with these Conditions cannot be completed within the required Completion Time, opening the RTCBs brings the reactor to a MODE where the LCO does not apply and ensures no CEA withdrawal will occur. The basis for the Completion Time of 6 hours is that it is adequate to complete the Required Actions without challenging plant systems, including the insertion of CEAs for plants that normally maintain CEAs withdrawn when shut down.~~

~~SURVEILLANCE REQUIREMENTS~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~In order for a plant to take credit for topical reports as the basis for justifying Frequencies, topical reports must be supported by an NRC staff Safety Evaluation Report that establishes the acceptability of each topical report for that plant.~~
~~--~~

~~SR 3.3.2.1~~

~~Performance of the CHANNEL CHECK on each wide range channel ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on another channel. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.~~

~~Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limits.~~

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~

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~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

~~SR 3.3.2.2~~

~~A CHANNEL FUNCTIONAL TEST on the power rate of change channels is performed to ensure the entire channel will perform its intended function if required. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Power Rate of Change - High trip Function is required during startup operation and is bypassed when shut down or > 15% RTP. [Additionally, operating experience has shown that these components usually pass the Surveillance when performed at a Frequency of once every 92 days prior to each reactor startup. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

1

~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SR 3.3.2.3~~

~~SR 3.3.2.3 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.2.2, except SR 3.3.2.3 is applicable only to bypass Functions and is performed prior to each startup. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.~~

~~Proper operation of bypass permissives is critical during plant startup because the bypasses must be in place to allow startup operation and must be removed at the appropriate points during power ascent to enable certain reactor trips. Consequently, the appropriate time to verify bypass removal function OPERABILITY is just prior to startup. [The allowance to conduct this Surveillance within 92 days of startup is based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Ref. 5).~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

~~Once the operating bypasses are removed, the bypasses must not fail in such a way that the associated trip Function gets inadvertently bypassed. This feature is verified by the trip Function CHANNEL FUNCTIONAL TEST, SR 3.3.2.2. Therefore, further testing of the bypass function after startup is unnecessary.~~

~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SR 3.3.2.4~~

~~SR 3.3.2.4 is the performance of a CHANNEL CALIBRATION.~~

~~CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.~~

~~Only the Allowable Values are specified for each RPS trip Function. Nominal trip setpoints are specified in the plant specific setpoint calculations. The nominal setpoints are selected to ensure the setpoints measured by CHANNEL FUNCTIONAL TESTS do not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable, provided that operation and testing are consistent with the assumptions of the plant specific setpoint calculations. Each Allowable Value specified is more conservative than the analytical limit assumed in the safety analysis in order to account for instrument uncertainties appropriate to the trip Function. These uncertainties are defined in the "Plant Protection System Selection of Trip Setpoint Values" (Ref. 4).~~

~~The as-found and as-left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. The requirements for this review are outlined in Reference 5.~~

~~[The Frequency is based upon the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

1

~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

~~The Surveillance is modified by a Note to indicate that the neutron detectors are excluded from CHANNEL CALIBRATION because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal.~~

~~REFERENCES~~

~~1. 10 CFR 50, Appendix A.~~

~~2. 10 CFR 100.~~

~~3. FSAR, Chapter [14].~~

~~4. "Plant Protection System Selection of Trip Setpoint Values."~~

~~5. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.~~

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.2 BASES, REACTOR PROTECTIVE SYSTEM (RPS) INSTRUMENTATION - SHUTDOWN (ANALOG)

1. ISTS 3.3.2, "Reactor Protective System (RPS) Instrumentation - Shutdown (Analog)," Specification is not included in the St. Lucie Plant (PSL) Unit 1 and Unit 2 ITS because the RPS Rate of Change function is not credited in any UFSAR Chapter 15 accident analysis. Monitoring of the function is addressed by ITS 3.3.11, “Logarithmic Neutron Flux Monitoring.” Therefore, the Bases associated with ISTS 3.3.2 is not included in the PSL Unit 1 and Unit 2 ITS Bases.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

1

~~3.3 INSTRUMENTATION (Analog)~~

~~3.3.9 Chemical and Volume Control System (CVCS) Isolation Signal (Analog)~~

~~LCO 3.3.9~~ ~~Four channels of West Penetration Room/Letdown Heat Exchanger Room pressure sensing and two Actuation Logic channels shall be OPERABLE.~~

~~APPLICABILITY:~~ ~~MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One Actuation Logic channel inoperable.~~	~~A.1 Restore the channel to OPERABLE status.~~	~~48 hours~~
~~B. One CVCS isolation instrument channel inoperable.~~	~~B.1 Place the channel in bypass or trip.~~	~~1 hour~~
	~~AND~~	
	~~B.2.1 Restore the channel to OPERABLE status.~~	~~48 hours~~
	~~OR~~	
	~~B.2.2 Place the channel in trip.~~	~~48 hours~~
~~C. Two CVCS isolation instrument channels inoperable.~~	~~C.1 Place one channel in bypass and place the other channel in trip.~~	~~1 hour~~
	~~AND~~	
	~~C.2 Restore one channel to OPERABLE status.~~	~~48 hours~~

~~ACTIONS (continued)~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~D. Required Action and associated Completion Time not met.~~	~~D.1 Be in MODE 3.~~ ~~AND~~ ~~D.2 ------------NOTE------------ LCO 3.0.4.a is not applicable when entering MODE 4. -------------------------------~~ ~~Be in MODE 4.~~	~~6 hours~~ ~~12 hours~~
~~E. Two Actuation Logic channels inoperable.~~	~~E.1 Be in MODE 3.~~ ~~AND~~ ~~E.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.3.9.1 Perform a CHANNEL CHECK.~~	~~[12 hours~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

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~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.3.9.2~~	~~-----------------------------NOTES-----------------------------~~ ~~1. Testing of Actuation Logic shall include the verification of the proper operation of each initiation relay.~~ ~~2. Relays associated with plant equipment that cannot be operated during plant operation are only required to be tested during each MODE 5 entry exceeding 24 hours unless tested within the previous 6 months.~~ ~~---~~ ~~Perform a CHANNEL FUNCTIONAL TEST on each CVCS isolation channel with setpoints in accordance with the following Allowable Values:~~ ~~West Penetration Room Pressure - High ≤ .5 psig~~ ~~Letdown Heat Exchanger Room Pressure - High ≤ .5 psig~~	~~[31 days~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~
~~SR 3.3.9.3~~	~~Perform a CHANNEL CALIBRATION on each CVCS isolation pressure indicating channel.~~	~~[18 months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.9, CHEMICAL AND VOLUME CONTROL SYSTEM (CVCS) ISOLATION SIGNAL

1. ISTS 3.3.9, "Chemical and Volume Control System (CVCS) Isolation Signal, "Specification is not included in the St. Lucie Plant (PSL) Unit 1 and Unit 2 ITS because PSL Unit 1 and Unit 2 does not include a Chemical and Volume Control System Isolation Signal.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

1

~~B 3.3 INSTRUMENTATION (Analog)~~

~~B 3.3.9 Chemical and Volume Control System (CVCS) Isolation Signal (Analog)~~

~~BASES~~

~~BACKGROUND~~

~~This LCO encompasses Chemical and Volume Control System (CVCS) Isolation Signal actuation. This is a plant specific instrumentation channel that performs an actuation Function required for plant protection and is not otherwise included in LCO 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Logic and Manual Trip," or LCO 3.3.6, "Diesel Generator (DG) - Loss of Voltage Start (LOVS)." This is a non-Nuclear Steam Supply System ESFAS Function that, because of differences in purpose, design, and operating requirements, is not included in LCOs 3.3.5 and 3.3.6. Details of this LCO are for illustration only. Individual plants shall include those Functions and LCO requirements that are applicable to them.~~

~~The CVCS Isolation Signal provides protection from radioactive contamination, as well as personnel and equipment protection in the event of a letdown line rupture outside containment.~~

~~Each of the two actuation subsystems will isolate a separate letdown isolation valve in response to a high pressure condition in either the West Penetration Room or Letdown Heat Exchanger Room. Two pressure detectors in each of these rooms feed the four sensor subsystems. On a two-out-of-four coincidence, both actuation subsystems will actuate.~~

~~Trip Setpoints and Allowable Values~~

~~Trip setpoints used in the bistables are based on the analytical limits stated in Reference 1. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in SR 3.3.9.2 are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in "Plant Protection System Selection of Trip Setpoint Values" (Ref. 2). The actual nominal trip setpoint entered into the bistable is normally still more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a CHANNEL FUNCTIONAL TEST. One example of such a change in measurement error is drift during the interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.~~

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~~BASES~~

~~BACKGROUND (continued)~~

~~Setpoints in accordance with the Allowable Value will ensure that Safety Limits are not violated during anticipated operational occurrences (AOOs) and the consequences of Design Basis Accidents will be acceptable, providing the plant is operated from within the LCOs at the onset of the AOO or accident and the equipment functions as designed.~~

~~APPLICABLE SAFETY ANALYSES~~

~~The CVCS Isolation Signal is redundant to the Safety Injection Actuation Signal for letdown line breaks outside containment. In addition, an excess flow check valve is located in containment just downstream of the regenerative heat exchanger, which isolates letdown when flow exceeds 200 gpm.~~

~~[At this unit, the provision of two sensors in each room in a two-out-of-four logic configuration satisfies the single failure criterion as follows:]~~

~~The CVCS satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).~~

~~LCO~~

~~Only the Allowable Values are specified for each trip Function in the LCO. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable, provided that the difference between the nominal trip setpoint and the Allowable Value is equal to or greater than the drift allowance assumed for each trip in the transient and accident analyses.~~

~~Each Allowable Value specified is more conservative than the analytical limit assumed in the transient and accident analysis, in order to account for instrument uncertainties appropriate to the trip Function. These uncertainties are defined in the "Plant Protection System Selection of Trip Setpoint Values" (Ref. 2).~~

~~CVCS isolation consists of closing the appropriate valve. This is undesirable at power, since letdown isolation will result. The absence of letdown flow will significantly decrease the charging flow temperature due to the absence of the regenerative heat exchanger preheating, causing unnecessary thermal stress to the charging nozzle. Therefore, the preferred action is to restore the valve function to OPERABLE status.~~

~~Four channels of West Penetration Room and Letdown Heat Exchanger Room pressure sensing and two Actuation Logic channels are required to be OPERABLE.~~

~~[For this unit, the Bases for the Allowable Values are as follows:]~~

~~[For this unit, the Bases for the LCO requirement are as follows:]~~

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~~BASES~~

~~APPLICABILITY~~

~~The CVCS Isolation Signal must be OPERABLE in MODES 1, 2, 3, and 4, since the possibility of a loss of coolant accident is greatest in these MODES. In MODE 5 or 6, the probability is greatly diminished, and there is time to manually isolate CVCS.~~

~~ACTIONS~~

~~A CVCS isolation channel is inoperable when it does not satisfy the OPERABILITY criteria for the channel's Function. The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the plant specific setpoint analysis. Typically, the drift is not large and would result in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a CHANNEL FUNCTIONAL TEST, when the process instrument is set up for adjustment to bring it within specification. If the trip setpoint is not consistent with the Allowable Value in SR 3.3.9.2, the channel must be declared inoperable immediately and the appropriate Conditions must be entered.~~

~~In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the sensor, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel should be declared inoperable and the LCO Condition entered for the particular protection Function affected.~~

~~When the number of inoperable channels in a trip Function exceeds those specified in any related Condition associated with the same trip Function, then the plant is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.~~

~~A.1~~

~~Condition A applies to the failure of one CVCS Actuation Logic channel associated with the CVCS Isolation Signal. Required Action A.1 requires restoration of the inoperable channel to restore redundancy of the affected Function. The Completion Time of 48 hours is consistent with the Completion Time of other ESFAS Functions and should be adequate for most repairs, while minimizing the risk of operating with an inoperable channel.~~

~~ACTIONS (continued)~~

~~B.1, B.2.1, and B.2.2~~

~~Condition B applies if one of the four CVCS instrument channels is inoperable. The Required Actions are identical to those of ESFAS Functions employing four redundant sensors specified in LCO 3.3.4, "Engineered Safety Features Actuation System (ESFAS) Instrumentation." The channel must be placed in bypass or trip if it cannot be repaired within 1 hour (Required Action B.1). The provision of four trip channels allows one channel to be bypassed (removed from service) during operations, placing the ESFAS in two-out-of-three coincidence logic. Placing the channel in bypass is preferred, since the CVCS isolation Function will be in two-out-of-three logic. This will avoid possible inadvertent CVCS isolation if an additional channel fails. The 1 hour Completion Time to bypass or trip the channel is sufficient time to perform the Required Actions.~~

~~Once the Required Action to trip or bypass the channel has been complied with, Required Action B.2.1 and Required Action B.2.2 provide for restoring the channel to OPERABLE status or placing it in trip within 48 hours. Required Action B.2.1 restores the full capability of the Function. Required Action B.2.2 places the Function in a one-out-of-three configuration. In this configuration, common cause failure of dependent channels cannot prevent CVCS isolation actuation. The Completion Time provides the operator with time to take appropriate actions and still ensures that any risk involved in operating with a failed channel is acceptable. It is improbable that a failure of a second channel will occur during any given 48 hour period.~~

~~C.1 and C.2~~

~~Condition C applies if two of the four CVCS West Penetration Room/Letdown Heat Exchanger Room Pressure - High channels are inoperable. The Required Actions are identical to those for other ESFAS Functions employing four redundant sensors in LCO 3.3.4.~~

~~Restoring at least one channel to OPERABLE status is the preferred Required Action. If this cannot be accomplished, one channel should be placed in bypass and the other channel in trip. The allowed Completion Time of 1 hour is sufficient time to perform the Required Actions.~~

~~Once the Required Action to trip or bypass the channel has been complied with, Required Action C.2 provides for restoring one channel to OPERABLE status within 48 hours. The justification of the 48 hour Completion Time is the same as for Condition B.~~

~~BASES~~

~~ACTIONS (continued)~~

~~After one channel is restored to OPERABLE status, the provisions of Condition C still apply to the remaining inoperable channel.~~

~~D.1 and D.2~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Adoption of a MODE 4 end state requires the licensee to make the following commitments:~~

1. ~~[Licensee] will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision [4F].~~

2. ~~[Licensee] will follow the guidance established in Revision 2 of WCAP-16364-NP, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," Westinghouse, May 2010.~~

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~~Condition D is entered when the Required Actions and associated Completion Times of Condition A, B, or C are not met. The plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours.~~

~~Remaining within the Applicability of the LCO is acceptable because the plant risk in MODE 4 is similar to or lower than MODE 5 (Ref. 3). In MODE 4 there are more accident mitigation systems available and there is more redundancy and diversity in core heat removal mechanisms than in MODE 5. However, voluntary entry into MODE 5 may be made as it is also an acceptable low-risk state. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.~~

~~Required Action D.2 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 4. This Note prohibits the use of LCO 3.0.4.a to enter MODE 4 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 4, and establishment of risk management actions, if appropriate. LCO 3.0.4 is~~

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~~BASES~~

~~ACTIONS (continued)~~

~~not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.~~

~~E.1 and E.2~~

~~Condition E specifies the shutdown track to be followed if two Actuation Logic channels are inoperable. The plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The Completion Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.~~

~~SURVEILLANCE REQUIREMENTS~~

~~SR 3.3.9.1~~

~~Performance of the CHANNEL CHECK on each CVCS isolation pressure indicating channel ensures that a gross failure of instrumentation has not occurred. A CHANNEL 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 the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL 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 transmitter or the signal processing equipment has drifted outside its limit.~~

~~[The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.~~

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~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
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~~SR 3.3.9.2~~

~~A CHANNEL FUNCTIONAL TEST is performed on each channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint analysis. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.~~

[~~The Frequency of 31 days is based on plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
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~~SURVEILLANCE REQUIREMENTS (continued)~~

~~Proper operation of the individual subgroup relays is verified by de-energizing these relays during the CHANNEL FUNCTIONAL TEST of the Actuation Logic. This will actuate the Function, operating all associated equipment. Proper operation of the equipment actuated by each train is thus verified. Note 1 indicates this test includes verification of operation for each initiation relay. [At this unit, the verification is conducted as follows:]~~

~~Note 2 indicates that relays that cannot be tested at power are excepted from the SR while at power. These relays must, however, be tested during each entry into MODE 5 exceeding 24 hours unless they have been tested within the previous 6 months.~~

~~[At this unit, the basis for this test exception is as follows:]~~

~~[At this unit, the following relays excepted by this Note are:]~~

~~SR 3.3.9.3~~

~~CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. CHANNEL CALIBRATIONS must be performed consistent with the plant specific setpoint analysis.~~

~~Radiation detectors may be removed and calibrated in a laboratory, calibrated in place using a transfer source or replaced with an equivalent laboratory calibrated unit.~~

~~[The Frequency is based upon the assumptions of an 18 month calibration interval for the determination of the magnitude of equipment drift in the setpoint analysis and includes operating experience as well as consistency with an 18 month fuel cycle.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

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~~BASES~~

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
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~~REFERENCES~~

1. ~~FSAR, Section [7.3].~~
2. ~~"Plant Protection System Selection of Trip Setpoint Values."~~
3. ~~CE NPSD-1186-A, Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG PWRs, October, 2001.~~

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.9 BASES, CHEMICAL AND VOLUME CONTROL SYSTEM (CVCS) ISOLATION SIGNAL

1. ISTS 3.3.9, "Chemical and Volume Control System (CVCS) Isolation Signal, "Specification is not included in the St. Lucie Plant (PSL) Unit 1 and Unit 2 ITS because PSL Unit 1 and Unit 2 does not include a Chemical and Volume Control System Isolation Signal. Therefore, the Bases associated with ISTS 3.3.9 is not included in the PSL Unit 1 and Unit 2 ITS Bases.