Summary of Changes
ITS Section 3.3

Change Description	Affected Pages
The changes described in the KPS response to question KAB-085 have been made. This change makes changes to the P-7 Interlock requirements.	Pages 9, 21, 37, 62, 70, 75, 76, 109, and 134
A change described in KAB-083 and previously submitted in Revision 1 had a typographical error. The ISTS Markup for SR 3.3.7.3 showed JFD 5 as the justification for a change and should be JFD 6. This is corrected in this Revision.	Page 468
A change described in RPG-010 and previously submitted in Revision 1 had a typographical error. The ISTS Markup for ITS 3.3.6 Condition C (1st Condition) did not line out the word "or." This has been corrected in this Revision.	Page 430
A typographical error was noted in the ISTS Markup for Table 3.3.6-1 Function 2.a, Surveillance Requirements column. The letters "SR" were inadvertently lined out for the second listed SR in the column. The letters have been added back in. In addition, an extraneous period has been removed from the wording of the ESFAS reference (Function 3.a.,) in Table 3.3.6-1 Function 3.	Page 433

Note that the black revision bars from Volume 8, Revision 1 are still present in Volume 8, Revision 2. The Revision 2 changes described above are shown by red revision bars.

ATTACHMENT 1

VOLUME 8

KEWAUNEE POWER STATION IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.3 INSTRUMENTATION

Revision 2

LIST OF ATTACHMENTS

1. **ITS 3.3.1**
2. **ITS 3.3.2**
3. **ITS 3.3.3**
4. **ITS 3.3.4**
5. **ITS 3.3.5**
6. **ITS 3.3.6**
7. **ITS 3.3.7**
8. **Relocated/Deleted Current Technical Specifications**
9. **ISTS Not Adopted**

ATTACHMENT 1

ITS 3.3.1, REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

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

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. See ITS 3.3.2, 3.3.5, and 3.3.6

LCO 3.3.1, DOC A04

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5. See ITS 3.3.2, 3.3.5, and 3,3.6

Add proposed ACTIONS Note A02

ACTION A

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable. See ITS 3.3.2, 3.3.5, and 3.3.6

ACTIONS D, E, and K

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip. See ITS 3.3.2, 3.3.5, and 3.3.6 L12

e. The accident monitoring instrumentation in Table TS 3.5-6 shall be OPERABLE whenever the plant is above HOT SHUTDOWN. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes. A change in operational MODES or conditions is acceptable with an inoperable accident monitoring instrumentation channel(s). See ITS 3.3.3

 A01

TABLE TS 3.5-2

Table 3.3.1-1 Function   LA01   A03   LA01   Applicability

INSTRUMENT OPERATION CONDITIONS FOR REACTOR TRIP

REQUIRED

		1	2	3	4	5	6
NO.	**FUNCTIONAL UNIT**	**NO. OF CHANNELS**	**NO. OF CHANNELS TO TRIP**	**MINIMUM OPERABLE CHANNELS**	**MINIMUM DEGREE OF REDUNDANCY**	**PERMISSIBLE BYPASS CONDITIONS**	**OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET**
1 1	Manual	2	1	~~1~~ 2	-		Maintain HOT SHUTDOWN
2	Nuclear Flux Power Range(1) (See ITS 3.1.8)						
2.b	Low setting	4	2	~~3~~ 4	1	P-10	Maintain HOT SHUTDOWN
2.a	High setting	4	2	~~3~~ 4	1		
3.a	Positive rate	4	2	~~3~~ 4	1		
3.b	Negative rate	4	2	~~3~~ 4	1		
4 3	Nuclear Flux Intermediate Range	2	1	~~1~~ 2	-	P-10	Maintain HOT SHUTDOWN(3)
5 4	Nuclear Flux Source Range	2	1	~~1~~ 2	-	P-6	Maintain HOT SHUTDOWN(3)
6 5	Overtemperature ΔT	4	2	~~3~~ 4	1		Maintain HOT SHUTDOWN
7 6	Overpower ΔT	4	2	~~3~~ 4	1		Maintain HOT SHUTDOWN
8.a 7	Low Pressurizer Pressure	4	2	~~3~~ 4	1	P-7	Maintain HOT SHUTDOWN
8.b 8	High Pressurizer Pressure	3	2	~~2~~ 3	-		Maintain HOT SHUTDOWN

Add proposed ACTION B — M01
Add proposed ACTION D — M02
Add proposed ACTION E — M03
Add proposed ACTION F — M04
Add proposed ACTION H — M05
Add proposed ACTION K — M06

M03 M06 M03 M05 M01 M02 M03 M04

Table 3.3.1-1 Note (e)
Table 3.3.1-1 Note (d)
Table 3.3.1-1 Note (b)

Add proposed Applicability and ACTION J — M10
Add proposed ACTION I — M07
Add proposed ACTION G — L01
Add proposed Applicability and ACTION C — M09
A04

Amendment No. 137
06/09/98

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ITS

A01

ITS 3.3.1

TABLE TS 3.5-2

INSTRUMENT OPERATION CONDITIONS FOR REACTOR TRIP

Table 3.3.1-1 Function

LA01

REQUIRED

A03

LA01

Applicability

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	~~MINIMUM~~ OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 ~~OR 4~~ CANNOT BE MET
9 9	Pressurizer High Water Level	3	2	~~2~~ 3	-	P-7	Maintain HOT SHUTDOWN
10 10	Low Flow In One Loop	3/loop	2/loop (any loop)	~~2~~ 3/loop	-	P-8	Maintain HOT SHUTDOWN
	Low Flow Both Loops	3/loop	2/loop (both loops)	~~2~~ 3/loop	-	P-7	Maintain HOT SHUTDOWN
11	~~Deleted~~						
14 12	Lo-Lo Steam Generator Water Level	3/loop	2/loop	~~2~~/loop 3	-		~~Maintain HOT SHUTDOWN~~
12 13	Undervoltage 4-kV	2/bus	1/bus (both buses)	~~1~~/bus 2	-	P-7	Maintain HOT SHUTDOWN
11.a, 11.b, 13 14	Underfrequency 4-kV Bus(4)	2/bus	1/bus (both buses)	~~1~~/bus 2	-		Maintain HOT SHUTDOWN
15	~~Deleted~~						
15 16	Steam Flow/Feedwater Flow Mismatch	2	1	~~1~~ 2/SG	-		Maintain HOT SHUTDOWN

M03 Add proposed ACTION E

M06 Add proposed ACTION K

L13 Add proposed ACTIONS L and M

A11 Add proposed Applicability and number of Required Channels

M03

M06

M06

M03

Table 3.3.1-1 Note (e)

Table 3.3.1-1 Note (f)

Table 3.3.1-1 Note (e)

A04

Amendment No. 94
11/12/91

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ITS A01 ITS 3.3.1

TABLE TS 3.5-2

Table 3.3.1-1 Function LA01 A03 LA01 Applicability

INSTRUMENT OPERATION CONDITIONS FOR REACTOR TRIP

		1	2	3	4	5	6
NO.	**FUNCTIONAL UNIT**	**NO. OF CHANNELS**	**NO. OF CHANNELS TO TRIP**	**~~MINIMUM~~ OPERABLE CHANNELS** (REQUIRED)	**~~MINIMUM DEGREE OF REDUNDANCY~~**	**PERMISSIBLE BYPASS CONDITIONS**	**OPERATOR ACTION IF CONDITIONS OF COLUMN 3 ~~OR 4~~ CANNOT BE MET**
17	Reactor Trip Breaker (RTB)	~~2~~	~~1~~	2	~~-~~	The RTBs may be bypassed for up to ~~8~~ 4 hrs. for surveillance testing ~~or maintenance~~	~~Maintain HOT SHUTDOWN and open the RTBs~~
18	(Independently Test Shunt and Undervoltage Trip Attachments)	~~2/bkr~~	~~1~~	2	~~-~~		~~After 72 hours maintain HOT SHUTDOWN and open the RTBs~~

M13

Add proposed ACTION O L02

L02

Add proposed Required Action R.1 and associated Completion Time. L03

Add proposed Required Action R.2 and associated Completion Time. M08

Add proposed Applicability and ACTION C M09

Add proposed Functions 20.a and 20.b and ACTION S M15

Amendment No. 94
11/12/91

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TABLE TS 3.5-2

Table 3.3.1-1
Function

INSTRUMENT OPERATION CONDITIONS FOR REACTOR TRIP

NOTES

(1) One additional channel may be taken out of service for zero power physics testing. See ITS 3.1.8

(2) Deleted M07

(3) When a block condition exists, maintain normal operation. L01

11.a, 11.b (4) Underfrequency on the 4-kV buses trips the Reactor Coolant Pump breakers, which in turn trips the reactor when power is above P-7. A11

LA02

Permissive/Interlock	Channels	Coincidence (REQUIRED CHANNELS)	Setting Limit
16.a P-6	Intermediate Range Nuclear Instrument	1 of 2	> 10^{-5}% RATED POWER
16.b P-7	Power Range Nuclear Instrument (Low Power Reactor Trips Block)	3 of 4 (1 per train) A03	≤ 12.2% RATED POWER
		AND	
16.e (P-13) A10	Turbine Impulse Pressure	2 of 2	≤ 12.2% RATED POWER [(a)]
16.c P-8	Power Range Nuclear Instrument	3 of 4	< 10% RATED POWER
16.d P-10	Power Range Nuclear Instrument	2 of 4	≥ 7.8% RATED POWER

(a) Setting Limit is converted to an equivalent turbine impulse pressure LA02

Add proposed Applicability A05

Add proposed ACTIONS P and Q L04

Amendment No. 195
03/28/2008

4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SPECIFICATION

SR 3.3.1.1, SR 3.3.1.2, SR 3.3.1.3, SR 3.3.1.5, SR 3.3.1.6, SR 3.3.1.7, SR 3.3.1.8, SR 3.3.1.9, SR 3.3.1.10, SR 3.3.1.11, SR 3.3.1.12, SR 3.3.1.13

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

SR 3.3.1.4, SR 3.3.1.14

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3.

See other ITS

c. Deleted

d. Deleted

e. Deleted

ITS

ITS 3.3.1

Table 3.3.1-1 Function

SR 3.3.1.1, SR 3.3.1.3

SR 3.3.1.2, SR 3.3.1.6, SR 3.3.1.10, SR 3.3.1.12

A01

TABLE TS 4.1-1

SR 3.3.1.7, SR 3.3.1.8, SR 3.3.1.13

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

Table 3.3.1-1 Function	CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
2.a, 2.b, 3.a, 3.b, 6, 16.c, 16.d	1. Nuclear Power Range Add proposed SR 3.3.1.11 for Functions 2.a, 2.b, 3.a, and 3.b	Each shift(a) -1 M11 Effective Full Power Month(c) -3	Daily(a) -2 L05 184 days Effective Full Power Quarter(c) -6 L06 Add proposed SR 3.3.1.8 Frequencies for Function 2.b L15 18 months for Functions 16.c and 16.d	Monthly(b) -7 Quarterly(d) -8, -13 L15 A13	(a) Heat balance (b) Signal to ΔT; bistable action (permissive, rod stop, trips) LA03 (c) Upper and lower chambers for axial off-set using incore detectors. The check and calibration for axial offset shall also be performed prior to > 75% power following any core alteration. L07 (d) Permissives P8 and P10 and the 25% reactor trip are tested quarterly. L06
4	2. Nuclear Intermediate Range Add proposed SR 3.3.1.11	Each shift(a,c) -1 M11	Not applicable L06 Add proposed SR 3.3.1.8 Frequencies	Prior to each startup if not done previous week(b) -8	(a) Once/shift when in service A07 (b) Log level; bistable action (permissive, rod stop, trips) LA04 (c) Channel check required in all plant modes A08
5	3. Nuclear Source Range Add proposed SR 3.3.1.11	Each shift(a,c) -1 M11	Not applicable L06 Add proposed SR 3.3.1.8 Frequencies and Surveillance Note	Prior to each startup if not done previous week(b) -8	(a) Once/shift when in service A07 (b) Bistable action (alarm, trips) LA05 (c) Channel check required in all plant modes A08
6, 7	4. Reactor Coolant Temperature	Each shift (c) -1	Each refueling cycle -12 184 days	Monthly(a) -7 Monthly(b) -7	(a) Overtemperature ΔT (b) Overpower ΔT (c) Channel check not required below HOT SHUTDOWN A09
10	5. Reactor Coolant Flow	Each shift -1	Each refueling cycle -10	Monthly -7 184 days L05	

Add proposed SR 3.3.1.1, SR 3.3.1.7, and SR 3.3.1.11 for MODE 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods are not fully inserted

M10

Amendment No. 151
02/12/2001

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TABLE TS 4.1-1 SR 3.3.1.7, SR 3.3.1.9

SR 3.3.1.1 SR 3.3.1.10

Table 3.3.1-1 Function

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

Table 3.3.1-1 Function	CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
9	6. Pressurizer Water Level	Each shift -1	Each refueling cycle -10	Monthly -7	184 days L05
8.a, 8.b	7. Pressurizer Pressure	Each shift -1	Each refueling cycle -10	Monthly -7	
12, 13	8. a. 4-KV Voltage and Frequency	Not applicable	Each refueling cycle -10	Monthly -9	Reactor protection circuits only 92 days L10
	b. 4-KV Voltage (Loss of Voltage)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only See ITS 3.3.5
	c. 4-KV Voltage (Degraded Grid)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only
	9. Analog Rod Position	Each shift(a,b)	Each refueling cycle	Each refueling cycle	(a) With step counters (b) Following rod motion in excess of 24 steps when computer is out of service
	10. Rod Position Bank Counters	Each shift(a,b)	Not applicable	Each refueling cycle	(a) With analog rod position (b) Following rod motion in excess of 24 steps when computer is out of service

See ITS 3.1.4 and 3.1.7

ITS A01 ITS 3.3.1

TABLE TS 4.1-1

SR 3.3.1.1 SR 3.3.1.10 SR 3.3.1.7

Table 3.3.1-1 Function

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS A06

	CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
14	11. a. Steam Generator Low Level	Each shift -1	Each refueling cycle -10	~~Monthly~~ -7	184 days L05
	b. Steam Generator High Level	Each shift	Each refueling cycle	Monthly	See ITS 3.3.2
15	12. Steam Generator Flow Mismatch	Each shift -1	Each refueling cycle -10	~~Monthly~~ -7	184 days L05
	13. ~~Deleted~~				
	14. Residual Heat Removal Pump Flow	Each shift (when in operation)	Each refueling cycle	Not applicable	See ITS 3.3.2
	15. ~~Deleted~~				
	16. Refueling Water Storage Tank Level	Weekly	Annually	Not applicable	See ITS 3.3.3
	17. ~~Deleted~~				

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 A01

Table 3.3.1-1
Function

TABLE TS 4.1-1

SR 3.3.1.1 SR 3.3.1.10 SR 3.3.1.5, SR 3.3.1.13

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
16.e 24. Turbine First Stage Pressure	Each shift -1	Each refueling cycle -10	~~Monthly~~ 18 months -13	L08
~~25. Deleted~~				See ITS 3.8.1
19 26. Protective System Logic Channel Testing	Not applicable	Not applicable	~~Monthly~~ -5	Includes auto load sequencer 92 days on STAGGERED TEST BASIS L09
~~27. Deleted~~				Add proposed Applicability and number of Required Channels M12 A12
~~28. Deleted~~				Add proposed ACTION N L14
29. Seismic Monitoring System	Each refueling cycle	Each refueling cycle	Not applicable	See ITS 3.3.3
30. Fore Bay Water Level	Not applicable	Each refueling cycle	Each refueling cycle	See ITS 3.7.8
31. AFW Flow Rate	(a)	Each refueling cycle	Not applicable	(a) Flow rate indication will be checked at each unit startup and shutdown
32. PORV Position Indication	Monthly	Each refueling cycle	Not applicable	
a. Back-up (Temperature)	Monthly	Each refueling cycle	Not applicable	
33. PORV Block Valve Position Indicator	Monthly	Each refueling cycle	Not applicable	

See ITS 3.3.3

Add proposed SR 3.3.1.13 for Function 16.a

Add proposed SR 3.3.1.11 for Functions 16.a, 16.c and 16.d

Add proposed SR 3.3.1.5 for Function 16.b

M14

Add proposed SR 3.3.1.10 for Function 20.a and SR 3.3.1.15 for Functions 20.a and 20.b

M15

Amendment No. 182
04/06/2005

A01

ITS

TABLE TS 4.1-3

ITS 3.3.1

Table 3.3.1-1 Function

L11

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

A06

EQUIPMENT TESTS[1]	SR 3.3.1.4, SR 3.3.1.14 TEST	FREQUENCY	
1. Control Rods	Rod drop times of all full length rods Partial movement of all rods not fully inserted in the core	Each REFUELING outage Quarterly when at or above HOT STANDBY	See ITS 3.1.4
17 1a. Reactor Trip Breakers	Independent test[2] shunt and undervoltage trip attachments -4	Monthly	
11.a, 11.b 1b. Reactor Coolant Pump Breakers-Open-Reactor Trip	OPERABILITY -14	Each REFUELING outage	
1 1c. Manual Reactor Trip	Open trip reactor[3] trip and bypass breaker -14	Each REFUELING outage	
2. ~~Deleted~~	Add proposed SR 3.3.1.14 for MODE 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods are not fully inserted	M09	
3. ~~Deleted~~			
4. Containment Isolation Trip	OPERABILITY	Each REFUELING outage	See ITS 3.6.3
5. Refueling System Interlocks	OPERABILITY	Prior to fuel movement each REFUELING outage	See CTS 3.8.a.11
6. ~~Deleted~~			
7. ~~Deleted~~			See ITS 3.4.15
8. RCS Leak Detection	OPERABILITY	Weekly[4]	See ITS 3.8.1 and 3.8.3
9. Diesel Fuel Supply	Fuel Inventory[5]	Weekly	
10. ~~Deleted~~			See ITS 4.0
11. Fuel Assemblies	Visual Inspection	Each REFUELING outage	
12. Guard Pipes	Visual Inspection	Each REFUELING outage	See ITS 3.6.1
13. Pressurizer PORVs	OPERABILITY	Each REFUELING cycle	
14. Pressurizer PORV Block Valves	OPERABILITY	Quarterly[6]	See ITS 3.4.11
15. Pressurizer Heaters	OPERABILITY[7]	Each REFUELING cycle	See ITS 3.4.9
16. Containment Purge and Vent Isolation Valves	OPERABILITY[8]	Each REFUELING cycle	See ITS 3.6.3

---

(1) ~~Following maintenance on equipment that could affect the operation of the equipment, tests should be performed to verify OPERABILITY.~~ L11

SR 3.3.1.4 Note (2) Verify OPERABILITY of the bypass breaker undervoltage trip attachment prior to placing breaker into service.

(3) ~~Using the Control Room push-buttons, independently test the reactor trip breakers shunt trip and undervoltage trip attachments. The test shall also verify the undervoltage trip attachment on the reactor trip bypass breakers.~~ LA06

(4) When reactor is at power or in HOT SHUTDOWN condition. See ITS 3.4.15

(5) Inventory of fuel required in all plant modes. See ITS 3.8.1 and 3.8.3

(6) Not required when valve is administratively closed. See ITS 3.4.11

(7) Test will verify OPERABILITY of heaters and availability of an emergency power supply. See ITS 3.4.9

(8) This test shall demonstrate that the valve(s) close in ≤ 5 seconds. See ITS 3.6.3

A01

ITS 3.3.1

2.3 LIMITING SAFETY SYSTEM SETTINGS - PROTECTIVE INSTRUMENTATION

APPLICABILITY

Applies to trip settings for instruments monitoring reactor power and reactor coolant pressure, temperature, flow, pressurizer level, and permissives related to reactor protection.

OBJECTIVE

To prevent the principal process variables from exceeding a SAFETY LIMIT.

SPECIFICATION

a. Reactor trip settings shall be as follows:

1. Nuclear Flux

A. Source Range (high setpoint)	within span of source range instrumentation
B. Intermediate range (high setpoint)	≤ 40% of RATED POWER
C. Power range (low setpoint)	≤ 25% of RATED POWER
D. Power range (high setpoint)	≤ 109% of RATED POWER
E. Power range fast flux rate trip (positive)	15%Δq/5 sec
F. Power range fast flux rate trip (negative)	10%Δq/5 sec

LA02

2. Pressurizer

A. High pressurizer pressure	≤ 2385 psig
B. Low pressurizer pressure	≥ 1875 psig
C. High pressurizer water level	≤ 90% of full scale

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A01

ITS 3.3.1

3. Reactor Coolant Temperature

A. Overtemperature

$$\Delta T \leq \Delta T_0 \left[K_1 - K_2 (T - T') \frac{1 + \tau_1 s}{1 + \tau_2 s} + K_3 (P - P') - f_1(\Delta I) \right]$$

where

ΔT_0	=	Indicated ΔT at RATED POWER, %
T	=	Average temperature, °F
T'	≤	[*]°F
P	=	Pressurizer pressure, psig
P'	=	[*] psig
K_1	=	[*]
K_2	=	[*]
K_3	=	[*]
τ_1	=	[*] sec.
τ_2	=	[*] sec.
$f_1(\Delta I)$	=	A function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers. Selected gains are based on measured instrument response during plant startup tests, where q_t and q_b are the percent power in the top and bottom halves of the core respectively, and $q_t + q_b$ is total core power in percent of RATED POWER, such that:

1. For $q_t - q_b$ within [*], [*] %, $f_1(\Delta I) = 0$.

2. For each percent that the magnitude of $q_t - q_b$ exceeds [*] % the ΔT trip setpoint shall be automatically reduced by an equivalent of [*] % of RATED POWER.

3. For each percent that the magnitude of $q_t - q_b$ exceed -[*] % the ΔT trip setpoint shall be automatically reduced by an equivalent of [*] % of RATED POWER.

Note: [*] As specified in the COLR

LA02

A01

ITS 3.3.1

B. Overpower

$$\Delta T \leq \Delta T_0 \left[K_4 - K_5 \frac{\tau_3 s}{\tau_3 s + 1} T - K_6 (T - T') - f_2 (\Delta I) \right]$$

where

ΔT_0 = Indicated ΔT at RATED POWER, %

T = Average Temperature, °F

T' ≤ [*]°F

K_4 ≤ [*]

K_5 ≥ [*] for increasing T; [*] for decreasing T

K_6 ≥ [*] for T > T'; [*] for T < T'

τ_3 = [*] sec.

f_2 (ΔI) = 0 for all ΔI

Note: [*] As specified in the COLR

LA02

4. Reactor Coolant Flow

A. Low reactor coolant flow per loop ≥ 90% of normal indicated flow as measured by elbow taps.

B. Reactor coolant pump motor breaker open

1. Low frequency setpoint ≥ 55.0 Hz

2. Low voltage setpoint ≥ 75% of normal voltage

LA02

5. Steam Generators

Low-low steam generator water level ≥ 5% of narrow range instrument span.

LA02

A01

ITS 3.3.1

6. Reactor Trip Interlocks

Protective instrumentation settings for reactor trip interlocks shall be as follows:

A. Prior to exceeding 12.2% of RATED POWER, the low pressurizer pressure trip, high pressurizer level trip, the low reactor coolant flow trips (for both loops), and the turbine trip-reactor trip are made functional.

B. Prior to exceeding 10% of RATED POWER, the single loop loss-of-flow trip is made functional.

LA02

7. Other Trips

A. Undervoltage ≥ 75% of normal voltage

B. Turbine trip

C. Manual trip

D. Safety injection trip (Refer to Table TS 3.5-1 for trip settings)

LA02

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DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse 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 3.5.c and Table TS 3.5-2 provide the compensatory actions to take when the RPS Instrumentation is inoperable. ITS 3.3.1 ACTIONS includes a Note that allows separate condition entry for each Function. In addition, due to the manner in which the titles of ITS Table 3.3.1-1 Functions 10, 11.a, 11.b, 12, 13, 14, 15, and 17 are presented, a separate condition entry is allowed within a Function as follows:

a. For Function 10 (Reactor Coolant Flow – Low on a loop basis;

b. For Function 11.a (Reactor Coolant Pump (RCP) Breaker Position (Single Loop)) on a RCP basis;

c. For Function 11.b (Reactor Coolant Pump (RCP) Breaker Position (Two Loop)) on a RCP basis;

d. For Function 12 (Undervoltage RCPs) on a bus basis;

e. For Function 13 (Underfrequency RCPs) on a bus basis;

f. For Function 14 (Steam Generator (SG) Water Level Low Low) on a steam generator basis;

g. For Function 15 (SG Water Level – Low (Coincident with Steam Flow/Feedwater Flow Mismatch) on a steam generator basis; and

h. For Function 17 (Reactor Trip Breakers (RTBs) on a train basis.

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 loop, steam generator, or train basis.

This change is acceptable because it clearly states the current requirement. The CTS considers each RPS instrument Function to be separate and independent from the others. In addition, the channels associated with Functions 10, 11.a, 11.b, 12, 13, 14, 15, and 17 are allowed separate Condition entry on the specified basis (i.e., loop, SG, or train) since the channels associated with each loop or steam generator, as applicable, 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.

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A03 CTS Table TS 3.5-2, Column 3 specifies the "MINIMUM OPERABLE CHANNELS" associated with each RPS Functional Unit and CTS 3.5.2 specifies the actions to take when the number of channels for a particular Functional Unit is less than the Column 3 requirements. Additionally, the Notes for Table TS 3.5-2 contain a table that pertains to the RPS Permissives and Interlocks. This Note table contains a column titles "Coincident," which describes the coincidence logic needed for each permissive/interlock. ITS LCO 3.3.1 requires the RPS Instrumentation to be OPERABLE, and includes only one column in Table 3.3.1-1 titled "REQUIRED CHANNELS." This changes the CTS by changing the title of the MINIMUM OPERABLE CHANNELS" and "Coincidence" columns to "REQUIRED CHANNELS." In addition, the P-7 channel description has been changed to 1 per train.

This change is acceptable because the ITS Table 3.3.1-1 "REQUIRED CHANNELS" column reflects the requirements for when actions are required to be taken, consistent with the CTS Table TS 3.5-2 column when actions must be taken. In addition, the change is acceptable for the RPS Permissives and Interlocks Note table since the description of the coincidence logic that is required (e.g., 1 of 2 for P-6) implies that all the Permissives and Interlock channels are required. Furthermore, the P-7 receives 4 inputs from nuclear instrumentation and 2 inputs from turbine impulse pressure. These inputs are combined such that the actual P-7 has a single channel per RPS logic train. The ITS reflects this design. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table TS 3.5-2 Column 6 specifies the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." CTS Table TS 3.5-2 Column 6 requires maintaining HOT SHUTDOWN for Functional Units 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16, and 17. Based on the CTS Table TS 3.5-2 requirement to maintain HOT SHUTDOWN, the Mode of Applicability would be considered OPERATING and HOT STANDBY for Functional Units 1(Manual), 2, (Nuclear Flux Power Range (High Setting, Positive Setting, and Negative Setting)), 5 (Overtemperature ΔT), 6 (Overpower ΔT), 8 (High Pressurizer Pressure), 12 (Lo-Lo Steam Generator Water Level), 16 (Steam Flow/Feedwater Flow Mismatch), and 17 (Reactor Trip Breaker (RTB) and (Independently Test Shunt and Undervoltage Trip Attachments). For Functional Unit 2 (Nuclear Flux Power Range (Low Setting)), the Mode of Applicability is OPERATING below the P-10 interlock and HOT STANDBY for the Nuclear Flux Power Range (Low Setting) because Column 5 of Table TS 3.5-2 lists the permissible bypass condition as P-10. This means that the Nuclear Flux Power Range (Low Setting) channels are blocked above the P-10 setting. With the P-10 Setting Limit of < 7.8% RATED POWER, Nuclear Flux Power Range (Low Setting) would be required to be OPERABLE in the OPERATING MODE below the P-10 limit and in HOT STANDBY. For Functional Unit 3 (Nuclear Flux Intermediate Range), the MODE of Applicability is OPERATING below the P-10 interlock and HOT STANDBY because Column 5 of Table TS 3.5-2 lists the permissible bypass condition as P-10. This means that the Nuclear Flux Intermediate Range channels are blocked above the P-10 setting. With the P-10 Setting Limit of < 7.8% RATED POWER, Nuclear Flux Intermediate Range would be required to be OPERABLE in the OPERATING MODE below the P-10 limit. Furthermore, since the Nuclear Flux Intermediate Range are not required until above the P-6

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setting, then the HOT STANDBY requirement would only be above the P-6 setting. Therefore, the MODE of Applicability, for the Nuclear Flux Intermediate Range, would be OPERATING below the P-10 interlock and HOT STANDBY above the P-6 interlock. For Functional Unit 4 (Nuclear Source Range), the Mode of Applicability is HOT STANDBY because Column 5 of Table TS 3.5-2 lists the permissible bypass condition as P-6. This means that the Nuclear Source Range channels are blocked when above the P-6 setting. With the P-6 Setting Limit of > 10^{-5}% RATED POWER, the Nuclear Source Range would not be required to be OPERABLE above HOT STANDBY. For Functional Unit 7 (Low Pressurizer Pressure), 9 (Pressurizer High Water Level), 13 (Undervoltage 4-kV), and 14 (Underfrequency 4-kV), the Mode of Applicability is OPERATING because Column 5 of Table TS 3.5-2 lists the permissible bypass condition as P-7. This means that the Low Pressurizer Pressure channel, the Pressurizer High Water Level, the Undervoltage 4-kV, and the Underfrequency 4-kV channels are blocked when below the P-7 setting. With the P-7 Setting Limit of > 12.2% RATED POWER, the Low Pressurizer Pressure, the Pressurizer High Water Level, the Undervoltage 4-kV, and the Underfrequency 4-kV would not be required to be OPERABLE below the OPERATING MODE. For Functional Unit 10 (Low Flow in One Loop and Low Flow Both Loops), the Mode of Applicability is OPERATING because Column 5 lists the permissible bypass condition for Low Flow in One Loop as P-8 and for Low Flow in Two Loops as P-7. For the Low Flow in One Loop, this means that the channels are blocked when below the P-8 setting. With the P-8 Setting Limit of < 10% RATED POWER, Low Flow in One Loop channel would not be required to be OPERABLE below the OPERATING MODE. For the Low Flow in Two Loops, this means that the channels are blocked when below the P-7 setting. With the P-7 Setting Limit of > 12.2% RATED POWER, the channel would not be required to be OPERABLE below the OPERATING MODE. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 1, 2.a, 2.b, 3.a, 3.b, 4, 6, 7, 8.b, 14, 15, 17, and 18 state that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 and 2. ITS Table 3.3.1-1 Function 2.b (Power Range Neutron Flux – Low) states that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 below the P-10 (Power Range Neutron Flux) interlock and MODE 2. ITS Table 3.3.1-1 Function 4 states that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 below the P-10 (Power Range Neutron Flux) and MODE 2 above the P-6 (Intermediate Range Neutron Flux) Interlocks. ITS Table 3.3.1-1 Function 5 (Source Range Neutron Flux) state that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 2 below the P-6 (Intermediate Range Neutron Flux) interlocks. ITS Table 3.3.1-1 Function 8.a, 9, 12, and 13 state that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 above the P-7 (Low Power Reactor Trip Block) interlock. ITS Table 3.3.1-1 Function 10 states that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 above the P-8 (Power Range Neutron Flux) interlock. This changes the CTS by explicitly stating the MODES of Applicability for each Functional Unit.

This change is acceptable because the requirements are the same. The ITS explicitly states the MODES of Applicability in ITS Table 3.3.1-1. This change is designated as administrative because it does not result in technical changes to the CTS.

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A05 CTS Table 3.5-2 includes Channels, Coincidence, and setting limits for P-6, P-7, P-8, P-10, and P-13. However, no specific Applicability requirements are provided. ITS Table 3.3.1-1 specifies the Applicable MODES or other specified conditions associated with the P-6, P-7, P-8, P-10, and P-13 interlocks (Functions 16.a, 16.b, 16.c, 16.d, and 16.e). This changes the CTS by adding specific applicable MODES or other specified conditions associated with P-6, P-7, P-8, P-10, and P-13 interlocks.

This change is acceptable because the change provides more explicit conditions for when the interlocks are required to be OPERABLE, and is consistent with the RPS Functions they support (i.e., the RPS instruments described in the Functional Unit column of CTS Table 3.5-2). This change is designated as administrative because it does not result in a technical change to the CTS.

A06 CTS 4.1.a requires calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1. Table TS 4.1-1 requires performance of a TEST at the frequencies shown on Table TS 4.1-1. CTS 4.1.b requires, in part, equipment tests shall be conducted as specified in Table TS 4.1-3. Table TS 4.1-3 requires performance of a TEST at the frequencies shown on Table TS 4.1-3. Table TS 4.1-1 requires performance of a TEST at the frequencies shown on Table TS 4.1-1. ITS 3.3.1 requires the performance of either a CHANNEL OPERATIONAL TEST (COT), a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT), or, in the case of the Automatic Trip Logic, an ACTUATION LOGIC TEST. This changes the CTS by changing the TEST requirements to a COT, a TADOT, or an ACTUATION LOGIC TEST.

This change is acceptable because the COT, a TADOT, or an ACTUATION LOGIC TEST continue to perform tests similar to the current TEST. This change is one of format only and any technical change to the requirements is specifically addressed in an individual Discussion of Change. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 Note (a) to CTS Table TS 4.1-1, Channel Description 2 and 3 in the Remarks Section states that Channel Check is once per shift when in service. For ITS Table 3.3.1-1 Function 4 and 5, ITS SR 3.3.1.1, the equivalent CHANNEL CHECK requirement, has a frequency of 12 hours. This changes the CTS by deleting this specific Note.

While the purpose of the Note appears to require the Channel Check only when it is in service, CTS 4.0.a, which provides the general requirements of all Surveillance Requirements, specifically states that Surveillances are only required to be met during the operational MODES or other specified conditions in the LCO. ITS SR 3.0.1 provides the same general requirement for Surveillances. Therefore, it is unnecessary to reiterate that a CHANNEL CHECK is required when the instrument is in service. Therefore, the deletion of this Note is acceptable and considered administrative, since the technical requirements have not been changed.

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A08 Note (c) to CTS Table TS 4.1-1, Channel Description 2 and 3 in the Remarks Section states that the Channel Check is required in all plant modes. For ITS Table 3.3.1-1 Function 4, ITS SR 3.3.1.1, the equivalent CHANNEL CHECK requirement, is only applicable in MODE 1 below the P-10 (Power Range Neutron Flux) interlocks and in MODE 2 above the P-6 (Intermediate Range Neutron Flux) interlocks consistent with the Applicability of the LCO. For ITS Table 3.3.1-1 Function 5, ITS SR 3.3.1.1, the equivalent CHANNEL CHECK requirement is only applicable in MODE 2 below the P-6 (Intermediate Range Neutron Flux) interlocks which is also consistent with the Applicable of the LCO. This changes the CTS by deleting this specific Note.

While the purpose of the Note appears to require the Channel Check requirement to be performed in all plant modes, CTS 4.0.a, which provides the general requirements of all Surveillance Requirements, specifically states that Surveillances are only required to be met during the operational MODES or other specified conditions in the LCO. While it does state that this can be modified as stated in an individual Surveillance, it furthers states that if the Surveillance is not met, then the actions of the LCO are to be taken. However, as stated in CTS 3.0.c, the plant only has to get out of the specific Applicability. Thus, while this Note appears to require the Channel Check in all plant modes, in actuality, it only is required when the LCO has to be met. Therefore, the deletion of this Note is acceptable and considered administrative, since the technical requirements have not been changed.

A09 Note (c) to CTS Table TS 4.1-1, Channel Description 4 in the Remarks Sections states that the Channel Check is not required below HOT SHUTDOWN. For ITS Table 3.3.1-1 Functions 6 and 7, ITS SR 3.3.1.1, the equivalent CHANNEL CHECK requirement, is only applicable in MODES 1 and 2 consistent with the Applicability of the LCO. This changes the CTS by deleting this specific Note.

Note (c) to CTS Table TS 4.1-1 allows the CHANNEL CHECK to not be performed when the unit is below HOT SHUTDOWN. This Note is not necessary since CTS 4.0.a, which provides the general requirements of all Surveillance Requirements, specifically states that Surveillances are only required to be met during the operational MODES or other specified conditions in the LCO. ITS SR 3.0.1 provides the same general requirement for Surveillances. Therefore, it is unnecessary to reiterate that the CHANNEL CHECK is required when the instrument is below the required MODE of Applicability. Therefore, the deletion of this Note is acceptable and considered administrative, since the technical requirements have not been changed.

A10 CTS Table TS 3.5-2 Notes contains a table listing the permissive/interlock. In the Table, the inputs to P-7 are listed but no title is given. The inputs for P-7 are from the Power Range Neutron Flux (P-10) and the Turbine Impulse Pressure (P-13) interlock. ITS Table 3.3.1-1 Function 16.b describes the P-7 interlock as the Low Power Reactor Trips Block. Additionally, it describes the P-13 input as the Turbine Impulse Pressure. This changes the CTS by stating the titles for the P-7 and P-13 interlocks.

The P-7 interlock is actuated by input from the Power Range Neutron Flux (P-10) or the Turbine Impulse Pressure (P-13) interlock. The P-7 permissive blocks

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trips at low power to allow plant startup and shutdown. This change is acceptable because the requirements are the same. Adding the titles for the permissive does not change how the permissive works. This change is designated as administrative because it does not result in a technical change to the CTS.

A11 CTS Table TS 3.5-2 Functional Unit 14 provides the requirements for the Underfrequency 4-kV Bus reactor trip function. When the minimum number of Underfrequency 4-kV Bus channels are not maintained OPERABLE (Column 3), Column 6 requires maintaining HOT SHUTDOWN. Furthermore, CTS Table TS 3.5-2 Functional Unit 14 contains a Note that states an underfrequency on the 4-kV buses trips the Reactor Coolant Pump breakers, which in turn trips the reactor when power is above P-7. Based on the above CTS Table TS 3.5-2 Functional Unit 14 and Note 4 requirements, the Reactor Coolant Pump Breaker Position reactor trip (i.e., one channel per RCP breaker) is required to be OPERABLE above the P-7 interlock to support CTS Table 3.5-2 Functional Unit 14. ITS Table 3.3.1-1 Function 11.a (Reactor Coolant Pump (RCP) Breaker Position – Single Loop) and Function 11.b (Reactor Coolant Pump (RCP) Breaker Position – Two Loops) each require one RCP Breaker Position channel per RCP to be OPERABLE. The Applicability for these channel requirements is MODE 1 above the P-8 interlock for Function 11.a and MODE 1 above the P-7 interlock for Function 11.b. This changes the CTS by explicitly stating the RCP Breaker Position requirements, including the number of required channels and the Applicability.

This change is acceptable because the requirements are the same. ITS 3.3.1 explicitly states the number of required channels as well as the Applicability requirements in ITS Table 3.3.1-1. Although the CTS does not specify the number of Reactor Coolant Pump Breaker Position reactor trip channels that are required to be OPERABLE, there is only one channel per RCP. This change is designated as administrative because it does not result in technical changes to the CTS.

A12 CTS Table TS 4.1-1 specifies the applicable testing requirements for the Protective System Logic Channels. Although the CTS does not provide a specific Applicability nor a specific number of Required Channels, all RPS Protective System Logic Channels are required to be OPERABLE when the associated Reactor Protection System (RPS) channels are required. Therefore, the Applicability of the Protective System Logic Channels is OPERATING and HOT STANDBY, which covers the Applicability of all of the RPS channels. ITS Table 3.3.1-1 Function 19 (Automatic Trip Logic) requires two trains of the Automatic Trip Logic to be OPERABLE in MODES 1 and 2. This changes the CTS by explicitly stating the requirements for the Protective System Logic Channels, including the number of required trains and the Applicability. The change that adds the Applicability of MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted Applicability is covered by DOC M12.

This change is acceptable because the requirements are the same. ITS 3.3.1 explicitly states the number of required trains as well as the Applicability requirements in ITS Table 3.3.1-1. Although the CTS does not specify the

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number of Protective System Logic Channel trains that are required to be OPERABLE, both trains are required to support OPERABILITY of all the required RPS channels. This change is designated as administrative because it does not result in technical changes to the CTS.

A13 Note (b) to CTS Table TS 4.1-1 Channel Description 2 (Nuclear Intermediate Range) states in the Remarks Sections to "log level" during the performance of the CHANNEL FUNCTIONAL TEST. ITS Table 3.3.1-1 Function 4 (Intermediate Range Neutron Flux) requires performance of a COT (SR 3.3.1.8), but does not contain a specific requirement to "log level." This changes the CTS by deleting the specific requirement to "log level" during the performance of the COT.

The purpose of Note (b) to CTS Table TS 4.1-1 Channel Description 2 is to ensure that the Nuclear Intermediate Range instrumentation is OPERABLE. This change is acceptable because this requirement duplicates the requirements of 10 CFR 50 Appendix B, Section XVII (Quality Assurance Records) to maintain records of activities affecting quality, including the results of tests (i.e., Technical Specification Surveillances). Compliance with 10 CFR 50 Appendix B is required in the KPS Operating License, which is adequate to ensure appropriate data is taken and maintained. The details of the regulations within the Technical Specifications are repetitious and unnecessary. Therefore, retaining the requirement to perform the associated Surveillance and eliminating the details from Technical Specification that are found in 10 CFR 50 Appendix B is considered a presentation preference. As such, this change is considered an administrative change.

<u>MORE RESTRICTIVE CHANGES</u>

M01 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 1 (Manual Reactor Trip) Column 3 requires one Manual Reactor Trip channel to OPERABLE. Thus, while there are two Reactor Manual Trip channels in the KPS design, the CTS allows one of the Reactor Manual Trip channels to be inoperable for an indefinite amount of time; no actions are required when one of the two Manual Reactor Trip channels is inoperable. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 1 requires two Manual Reactor Trip channels to be OPERABLE. ITS 3.3.1 ACTION B provides compensatory actions to take with one Manual Reactor Trip channel inoperable and requires restoration of the channel to OPERABLE status within 48 hours or to be in MODE 3 within 54 hours. This changes the CTS by requiring two channels of the Manual Reactor Trip Functional Unit to be OPERABLE instead of one channel and by adding a specific ACTION to take when one of two required channels is inoperable.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Manual Reactor Trip channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of

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the installed RPS channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable for an indefinite period of time. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M02 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. CTS Table TS 3.5-2 Functional Unit 2 (Nuclear Flux Power Range) Column 3 requires three Nuclear Flux Power Range High setting channels to be OPERABLE. Thus while there are four Nuclear Flux Power Range channels for each of the listed functions, the CTS allows one of the channels, for each function, to be inoperable for an indefinite amount of time; no actions are required when one of the four Nuclear Flux Power Range channels is inoperable. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 2.a requires four Power Range Neutron Flux – High channels to be OPERABLE. ITS 3.3.1 ACTION D provides compensatory actions to take with one Power Range Neutron Flux – High channel inoperable and requires placing the channel in trip within 72 hours and reducing THERMAL POWER to ≤ 75% RTP or placing the channel in trip within 72 hours and performing SR 3.2.4.2 when the Power Range Neutron Flux input to the QPTR is inoperable once per 12 hours or to be in MODE 3 within 78 hours. Additionally, ACTION D contains a Note that allows the inoperable channel to be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. This changes the CTS by requiring four channels of the Power Range Neutron Flux – High Functional Unit to be OPERABLE instead of the three channels and by adding a specific ACTION to take when one of the four required channels are inoperable. See DOC L12 for discussion of ACTION Note.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Power Range Neutron Flux – High channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of the installed RPS channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure under all conditions. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable for an indefinite period of time. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

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M03 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 2 (Nuclear Flux Power Range), Column 3 requires three Nuclear Flux Power Range Low setting channels, three Nuclear Flux Power Range Positive rate channels, and three Nuclear Flux Power Range Negative rate channels to be OPERABLE. Thus while there are four Nuclear Flux Power Range channels in the KPS design, the CTS allows one of the Nuclear Flux Power Range to be inoperable for an indefinite amount of time; no actions are required when one of the four Nuclear Flux Power Range channels is inoperable. Table TS 3.5-2 Functional Unit 5 (Overtemperature ΔT), Column 3 requires three Overtemperature ΔT channels to be OPERABLE. Thus while there are four Overtemperature ΔT channels in the KPS design, the CTS allows one of the Overtemperature ΔT channels to be inoperable for an indefinite amount of time; no actions are required for when one of the four Overtemperature ΔT channels is inoperable. Table TS 3.5-2 Functional Unit 6 (Overpower ΔT), Column 3 requires three Overpower ΔT channels to be OPERABLE. Thus while there are four Overpower ΔT channels in the KPS design, the CTS allows one of the Overpower ΔT channels to be inoperable for an indefinite period of time; no actions are required for when one of the four Overpower ΔT channels is inoperable. Table TS 3.5-2 Functional Unit 8 (High Pressurizer Pressure), Column 3 requires two High Pressurizer Pressure channels to be OPERABLE. Thus while there are three High Pressurizer Pressure channels in the KPS design, the CTS allows one of the High Pressurizer Pressure channels to be inoperable for an indefinite period of time; no actions are required for when one of the three High Pressurizer Pressure channels is inoperable. Table TS 3.5-2 Functional Unit 12 (Lo-Lo Steam Generator Pressure Water Level), Column 3 requires two Lo-Lo Steam Generator Pressure Water Level channels per loop to be OPERABLE. Thus while there are three Lo-Lo Steam Generator Pressure Water Level channels per loop in the KPS design, the CTS allows one of the Lo-Lo Steam Generator Pressure Water Level channels per loop to be inoperable for an indefinite period of time; no actions are required for when one of the three Lo-Lo Steam Generator Pressure Water Level channels per loop is inoperable. Table TS 3.5-2 Functional Unit 16 (Steam Flow/Feedwater Flow Mismatch), Column 3 requires one Steam Flow/Feedwater Flow Mismatch channel to be OPERABLE. Thus while there are two Steam Flow/Feedwater Flow Mismatch channels in the KPS design, the CTS allows one Steam Flow/Feedwater Flow Mismatch channel to be inoperable for an indefinite amount of time; no actions are required when one Steam Flow/Feedwater Flow Mismatch channel is inoperable. ITS LCO 3.3.1 requires the RPS Instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 2.b requires four Power Range Neutron Flux – Low channels to be OPERABLE. ITS Table 3.3.1-1 Function 3.a requires four Power Range Neutron Flux – High Positive Rate channels to be OPERABLE. ITS Table 3.3.1-1 Function 3.b requires four Power Range Neutron Flux – High Negative Rate channels to be OPERABLE. ITS Table 3.3.1-1 Function 6 requires four Overtemperature ΔT channels to be OPERABLE. ITS Table 3.3.1-1 Function 7 requires four Overpower ΔT channels to be OPERABLE. ITS Table 3.3.1-1 Function 8.a requires three Pressurizer Pressure – High channels to be OPERABLE. ITS Table 3.3.1-1 Function 14 requires three Steam Generator (SG) Water Level – Low Low channels per steam generator to

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be OPERABLE. ITS Table 3.3.1-1 Function 15 requires two SG Water Level-Low – Coincident with Steam Flow/Feedwater Flow Mismatch channels per steam generator to be OPERABLE. ITS 3.3.1 ACTION E provides compensatory actions to take when one Power Range Neutron Flux – Low channel, one Power Range Neutron Flux – High Positive Rate channel, one Power Range Neutron Flux – High Negative Rate channel, one Overtemperature ΔT channel, one Overpower ΔT channel, Pressurizer Pressure – High channel, one Steam Generator (SG) Water Level – Low Low channel, or one SG Water Level – Low – Coincident with Steam Flow/Feedwater Flow Mismatch channel is inoperable and requires placing the inoperable channel in trip within 72 hours or to be in MODE 3 within 78 hours. Additionally, ACTION E contains a Note which allows the inoperable channel to be bypassed for up to 12 hours for Surveillance testing of other channels. This changes the CTS by requiring additional channels for Nuclear Flux Power Range Low setting channel, Nuclear Flux Power Range Positive rate channel, Nuclear Flux Power Range Negative rate channel, Overtemperature ΔT channel, Overpower ΔT channel, High Pressurizer Pressure channel, Lo-Lo Steam Generator Pressure Water Level channels per loop, and Steam Flow/Feedwater Flow Mismatch channel to be OPERABLE. See DOC L12 for discussion of ACTION Note.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Power Range Neutron Flux – Low, Power Range Neutron Flux – High Positive Rate, Power Range Neutron Flux – High Negative Rate, Overtemperature ΔT, Overpower ΔT, Pressurizer Pressure – High, Steam Generator (SG) Water Level – Low Low, or SG Water Level – Low – Coincident with Steam Flow/Feedwater Flow Mismatch channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of the installed RPS channels are required OPERABLE. Additionally, in the SG Water Level – Low – Coincident with Steam Flow/Feedwater Flow Mismatch channel, it will ensure sufficient channels are required OPERABLE to account for a single failure under all conditions. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable for an indefinite period of time. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M04 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 3 (Nuclear Flux Intermediate Range), requires one Nuclear Flux Intermediate Range channel to be OPERABLE. Thus while there are two Nuclear Flux Intermediate Range channels in the KPS design, the CTS allows for one of the Nuclear Flux Intermediate Range channels to be inoperable for an indefinite amount of time; no actions are required when one of the two Nuclear Flux Intermediate Range channels is inoperable. ITS LCO 3.3.1 requires the RPS Instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table

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3.3.1-1 Function 4 requires two Intermediate Range Neutron Flux channels to be OPERABLE. ITS 3.3.1 ACTION F provides compensatory actions to take when one Intermediate Range Neutron Flux channel is inoperable and requires reducing THERMAL POWER to < P-6 within 24 hours or increasing THERMAL POWER to > P-10 with 24 hours. This changes the CTS by requiring two channels of the Intermediate Range Neutron Flux Functional Unit to be OPERABLE instead of the one channel and by adding a specific ACTION to take when one of the two required channels is inoperable.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Intermediate Range Neutron Flux channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of the installed RPS channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure under all conditions. This change is also acceptable because the new Required Actions and Completion Times are used to establish remedial measures that must be taken in response to degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M05 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 4 (Nuclear Flux Source Range), Column 3 requires one Nuclear Flux Source Range channel to be OPERABLE. Thus while there are two Nuclear Flux Source Range channels in the KPS design, the CTS allows for one of the Nuclear Flux Source Range channels to be inoperable for an indefinite amount of time no actions are required when one of the two Nuclear Flux Source Range channels is inoperable. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 5 requires two Source Range Neutron Flux channels to be OPERABLE. ITS 3.3.1 ACTION H provides compensatory actions to take with one Nuclear Flux Source Range channel inoperable and requires immediate suspension of operations involving positive reactivity additions. Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. This changes the CTS by requiring two channels of the Nuclear Flux Source Range Functional Unit to be OPERABLE instead of the one channel currently required by CTS and by adding a specific ACTION to take when one of the two required channels is inoperable.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Nuclear Flux Source Range channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of the installed RPS channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure under all conditions. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable for an

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indefinite period of time. This change is also acceptable because the new Required Actions and Completion Times are used to establish remedial measures that must be taken in response to degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M06 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 7 (Low Pressurizer Pressure), Column 3 requires three Low Pressurizer Pressure channels to be OPERABLE. Thus while there are four Low Pressurizer Pressure channels in the KPS design, the CTS allows one of the Low Pressurizer Pressure channels to be inoperable for an indefinite amount of time; no actions are required when one of the four Low Pressurizer Pressure channels are inoperable. Table 3.5-2 Functional Unit 9 (Pressurizer High Water Level), Column 3 requires two Pressurizer High Water Level channels to be OPERABLE. Thus while there are three Pressurizer High Water Level channels in the KPS design, the CTS allow one of the Pressurizer High Water Level channels to be inoperable for an indefinite period of time; no actions are required when one of the three Pressurizer High Water Level channels are inoperable. Table 3.5-2 Functional Unit 10 (Low Flow in One Loop and Low Flow in Both Loops), Column 3 requires two Low Flow channels to be OPERABLE. Thus while there are three Low Flow channels per loop in the KPS design, the CTS allows one Low Flow channel in any loop to be inoperable for an indefinite period of time; no action required when one channel in any Low Flow loop channel is inoperable. Table 3.5-2 Functional Unit 13 (Undervoltage 4-kV), Column 3 requires one Undervoltage 4-kV channel per bus to be OPERABLE. Thus while there are two Undervoltage 4-kV channels per bus in the KPS design, the CTS allows one Undervoltage 4-kV channel per bus to be inoperable for an indefinite period of time; no action required when one Undervoltage 4-kV channel per bus is inoperable. Table 3.5-2 Functional Unit 14 (Underfrequency 4-kV), Column 3 requires one Underfrequency 4-kV channel per bus to be OPERABLE. Thus while there are two Underfrequency 4-kV channels per bus in the KPS design, the CTS design allows one Underfrequency 4-kV channel per bus to be inoperable for an indefinite period of time; no action required when one Underfrequency 4-kV channel per bus is inoperable. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 8.a requires four Pressurizer Pressure – Low channels to be OPERABLE. ITS Table 3.3.1-1 Function 9 requires three Pressurizer Water Level – High channels to be OPERABLE. ITS Table 3.3.1-1 Function 10 requires three Reactor Coolant Flow – Low channels per loop to be OPERABLE. ITS Table 3.3.1-1 Function 12 requires two Undervoltage RCPs per bus to be OPERABLE. ITS 3.3.1-1 Function 13 requires two Underfrequency RCPs per loop to be OPERABLE. ITS 3.3.1 ACTION K provides compensatory actions to take with one Pressurizer Pressure – Low channel inoperable, one Pressurizer Water Level – High channel inoperable, one Reactor Coolant Flow – Low channel inoperable, one Undervoltage RCP channel inoperable, or one Underfrequency RCP channel inoperable and requires placing the channel in trip within 72 hours or reducing THERMAL POWER to < P-7 within 78 hours. This

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changes the CTS by requiring four channels of the Pressurizer Pressure – Low instead of the three channels, three Pressurizer Water Level – High channels instead of the two channels, three Reactor Coolant Flow – Low channels per loop instead of the two channels per loop, two Undervoltage RCPs channels per bus instead of the one channel per bus, and two Underfrequency RCPs channels per bus instead of one channel per bus.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Pressurizer Pressure – Low channels, Pressurizer Water Level – High channels, Reactor Coolant Flow – Low channels, Undervoltage RCPs channels, or Underfrequency RCPs channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.1-1 will ensure that all of these installed RPS channels are required OPERABLE. This change is also acceptable because the new Required Actions and Completion times are used to establish remedial measures that must be taken in response to degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M07 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 4 (Nuclear Flux Source Range), Column 3 requires one Nuclear Flux Source Range channel to be OPERABLE. If both of the Nuclear Flux Source Range channels are inoperable, then Table TS 3.5-2 Functional Unit 4 Column 6 requires maintaining HOT SHUTDOWN. Since there is no required action to take when there are two Nuclear Flux Source Range channels, CTS 3.0.c must be entered. CTS 3.0.c requires action to be initiated within 1 hour and to be in HOT STANDBY (equivalent to ITS MODE 2) in the following 6 hours and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the next 6 hours. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 5 requires two Source Range Neutron Flux channels to be OPERABLE in MODE 2 when below the P-6 (Intermediate Range Neutron Flux) interlock. ITS 3.3.1 ACTION I provides actions for two inoperable Source Range Neutron Flux channels and requires the reactor trip breakers (RTBs) to be opened immediately. This changes the CTS by requiring the RTBs to be open immediately if both Source Range Neutron Flux channels become inoperable, in lieu of performing a controlled shutdown to HOT SHUTDOWN in 13 hours.

This change is acceptable because with no Source Range Neutron Flux channels OPERABLE and with the reactor in a condition of being capable of achieving criticality, the operator may have no automatic safety function capable of shutting down the unit. Therefore, the unit must be placed in a safe condition. This is accomplished by opening the RTBs, which inserts all rods. This change is designated as more restrictive because the actions added are more restrictive than are required by the CTS.

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M08 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 17 (RTB (Independently Test Shunt and Undervoltage Attachments)), Column 3 requires two Independently Test Shunt and Undervoltage Attachments per RTB to be OPERABLE. If one Independently Test Shunt and Undervoltage Attachments per RTB is inoperable, then Table 3.5-2 Column 6 requires maintaining HOT SHUTDOWN and opening of the RTBs after 72 hours. ITS Table 3.3.1-1 Function 18 requires two Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms per RTB to be OPERABLE. ITS 3.3.1 ACTION R provides compensatory actions to take with one RTB Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms per RTB inoperable and requires restoration of the inoperable trip mechanism to OPERABLE status within 48 hours or to be in MODE 3 within 54 hours. This changes the CTS by requiring entrance into MODE 3 within 54 hours instead of the 72 hours in the CTS.

The purpose of the CTS Actions is to ensure proper compensatory measures are taken in the event of an inoperable RTB trip mechanism and to place the unit in a safe condition. This change is acceptable because placing the unit in MODE 3 places the unit in a MODE where the RTB's are not required. The Completion Time of 54 hours allows 48 hours to restore the RTB trip mechanism to OPERABLE status and 6 hours to reach MODE 3. The 6 hours is a reasonable time to reach MODE 3 from full power without challenging unit systems. This change is more restrictive because the Completion Time for the unit to be placed in MODE 3 has been decreased.

M09 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 1 (Manual Reactor Trip) Column 6 requires maintaining HOT SHUTDOWN. Table TS 3.5-2 Functional Unit 17 (Reactor Trip Breakers and Independently Test Shunt and Undervoltage Trip Attachments) Column 6 requires, in part, maintaining HOT SHUTDOWN. Thus, the applicability for these Functional Units is determined to be HOT STANDBY and OPERATING. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 1 specifies the Applicability of the Manual Reactor Trip as MODES 1 and 2 (equivalent to CTS OPERATING and HOT STANDBY, respectively); and MODES 3, 4, and 5 (equivalent to CTS HOT SHUTDOWN, INTERMEDIATE SHUTDOWN and COLD SHUTDOWN, respectively) when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted. ITS Table 3.3.1-1 Function 17 specifies the Applicability of the Reactor Trip Breakers (RTBs) trains to be MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted, in addition to MODES 1 and 2. ITS Table 3.3.1-1 Function 18 requires the Applicability of the Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms to be MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted, in addition to MODES 1 and 2. Commensurate with the addition of the new MODES of Applicability, ACTION C was added to address when there is one channel or train inoperable in MODES 3, 4, and 5 when the Rod Control System

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is capable of rod withdrawal or when one or more rods are not fully inserted. ACTION C requires that with one channel or train inoperable, to either restore the channel or train to OPERABLE status within 48 hours or to initiate action to fully insert all rods within 48 hours and to place the Rod Control System in a condition incapable of rod withdrawal within 49 hours. Additionally, commensurate with the addition of the new MODES of Applicability, new Surveillance Requirements are being adding. ITS SR 3.3.1.14 has been added for Function 1 to perform a TADOT every 18 months, but is modified by a Note that states that the verification of the setpoint is not required. ITS SR 3.3.1.4 has been added for Function 17 and 18 to perform a TADOT every 31 days, but is modified by a Note, which states that the Surveillance must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service. This changes the CTS by requiring the Manual Reactor Trip channels and the Reactor Trip Breakers (RTBs) trains to be OPERABLE in MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted. Furthermore, this change adds an ACTION to take when the Manual Reactor Trip channels and the Reactor Trip Breakers (RTBs) trains are inoperable in MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted. It also adds additional Surveillance Requirements for the new MODE of Applicability.

This change is acceptable because in MODE 3, 4, or 5 if one or more shutdown rods or control rods are withdrawn or the Rod Control System is capable of withdrawing the shutdown rods or the control rods, there is a possibility of an inadvertent control rod withdrawal. Therefore, action must be taken to restore the channel or train or to place the unit in a condition where there are no withdrawn rods and the ability to withdraw rods is precluded. This change is also acceptable because the new Required Actions and Completion Times 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. Furthermore, the new Surveillance Requirements will ensure that the instrumentation is OPERABLE and able to perform it required function. This change is designated as more restrictive because additional MODES of Applicability have been added, additional Required Actions and Completion Times, and new Surveillance Requirements are being applied to the ITS that were not required in the CTS.

M10 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 4 (Nuclear Flux Source Range) Column 6 requires maintaining HOT SHUTDOWN. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 5 specifies the Applicability of the Source Range Neutron Flux to be MODE 2 below the P6 (Intermediate Range Neutron Flux) interlocks: and MODES 3, 4, and 5 (equivalent to CTS HOT SHUTDOWN, INTERMEDIATE SHUTDOWN and COLD SHUTDOWN, respectively) when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted. Commensurate with the addition of the new MODES of Applicability, ACTION J was added to address when there is one Source Range Neutron Flux channel inoperable in MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal

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or when one or more rods are not fully inserted. ACTION J requires either restoration of the channel to OPERABLE status within 48 hours or initiation of action to fully insert all rods within 48 hours and placing the Rod Control System in a condition incapable of rod withdrawal within 49 hours. Additionally, commensurate with the addition of the new MODES of Applicability, new Surveillance Requirements are being added. ITS SR 3.3.1.1 is being added to perform a CHANNEL CHECK every 12 hours. ITS SR 3.3.1.7 is being added to perform a COT every 184 days, but is modified by a Note that states that it is not required to be performed for the source range instrumentation until 4 hours after entering MODE 3 from MODE 2. ITS SR 3.3.1.11 is being added to perform a CHANNEL CALIBRATION every 18 months, but excludes the neutron detectors from the CHANNEL CALIBRATION. This changes the CTS by requiring the Source Range Neutron Flux channels to OPERABLE in MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted. Furthermore, this change adds the Applicability of MODES 3, 4, and 5 when the Rod Control System is capable of rod withdrawal or when one or more rods are not fully inserted and adds an ACTION to take when the Source Range Neutron Flux channels are inoperable in these MODES. It also adds additional Surveillance Requirements for the new MODES of Applicability. (See DOC A04 for the justification of the MODE 2 below the P6 (Intermediate Range Neutron Flux) interlocks Applicability change.)

This change is acceptable because in MODE 3, 4, or 5 if one or more shutdown rods or control rods are withdrawn or the Rod Control System is capable of withdrawing the shutdown rods or the control rods, there is a possibility of an inadvertent control rod withdrawal. Therefore, action must be taken to restore the channel or train or to place the unit in a condition where there are no withdrawn rods and the ability to withdraw rods is precluded. This change is also acceptable because the new Required Actions and Completion Times 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. Furthermore, the new Surveillance Requirements will ensure that the instrumentation is OPERABLE and able to perform it required function. This change is designated as more restrictive because additional MODES of Applicability have been added, additional Required Actions and Completion Times are being applied, and new Surveillance Requirements are being added to the ITS that were not required in the CTS.

M11 ITS Table 3.3.1-1 Functions 2.a (Power Range Neutron Flux – High), 2.b (Power Range Neutron Flux – Low), 3.a (Power Range Neutron Flux Rate – High Positive Rate), 3.b (Power Range Neutron Flux Rate – High Negative Rate), 4 (Intermediate Range Neutron Flux), and 5 (Source Range Neutron Flux) require performance of a CHANNEL CALIBRATION in accordance with the Setpoint Control Program (ITS SR 3.3.1.11) every 18 months. This CHANNEL CALIBRATION is modified by a Note, which states that the Neutron detectors are excluded from the CHANNEL CALIBRATION. CTS Table TS 4.1-1 does not contain a requirement for a CHANNEL CALIBRATION of the Nuclear Power Range, Nuclear Intermediate Range and Nuclear Source Range instrumentation. This changes the CTS by requiring a CHANNEL CALIBRATION of the Nuclear Power Range, Nuclear Intermediate Range and Nuclear Source Range instrumentation every 18 months.

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This change is acceptable because the addition of the CHANNEL CALIBRATION demonstrates that the Power Range Neutron Flux, Intermediate Range Neutron Flux and Source Range Neutron Flux instruments are OPERABLE. The CHANNEL CALIBRATION of the power range neutron detectors consists of a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP. The CHANNEL CALIBRATION of the source range and intermediate range neutron detectors consists of obtaining the detector plateau and preamp discriminator curves, evaluating those curves and comparing the curves to the manufactures data. The 18 month frequency is based on the need to perform the surveillance under conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance was performed with the reactor at power. This change is acceptable because it will ensure that the instrumentation is OPERABLE. This change is designated as more restrictive because the ITS requires a Surveillance Requirement that is not currently required in the CTS.

M12 CTS Table 4.1-1 Channel Description 26 requires a monthly test of the Protection System Logic Channel. However, the CTS does not specify an Applicability or Actions to take if these channels are inoperable or the number of Required Channels. However, all RPS Protective System Logic Channels are required to be OPERABLE when the associated RPS channels are required. Currently, this is MODES 1 and 2 as described in DOC A12. ITS Table 3.3.1-1 Function 19 provides the appropriate MODES 1 and 2 requirements. ITS Table 3.3.1-1 Function 19 also requires two trains of the Automatic Trip Logic to be OPERABLE in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. If one train of the Automatic Trip Logic is inoperable in MODES 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted, then ITS 3.3.1 ACTION C requires either restoration of the train to OPERABLE status within 48 hours or to initiate action to fully insert all rods within 48 hours and to place the Rod control System in a condition incapable of rod withdrawal within 49 hours. This changes the CTS by adding new requirements for MODES 3, 4, and 5, including a new ACTION.

The purpose of the automatic trip logic is to provide a means to interrupt power to the RTB's and allow rods to fall into the reactor core. This change is acceptable because in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted, the automatic trip logic is required because all rods are not fully inserted or they have the potential to not be fully inserted. Two trains are required to ensure that a random failure of a single train will not prevent a reactor trip. ACTION C is added for when the plant is in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. The Required Action and associated Completion Times of ACTION C are reasonable considering that the remaining OPERABLE train is adequate to perform the safety function and the low probability that an event will occur. This change is considered more restrictive because the ITS adds MODES 3, 4, and 5 requirments that were not required in the CTS.

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M13 CTS Table TS 3.5-2 Functional Unit 17 (Reactor Trip Breaker (RTB)), contains a Note that states that the RTBs may be bypassed for up to 8 hours for surveillance testing and maintenance. ITS 3.3.1 ACTION O, which provides the ACTIONS when one RTB train is inoperable, allows one train of the RTB to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. This changes the CTS by allowing only 4 hours for testing instead of 8 hours that is allowed in the CTS. See DOC L02 for changes related to the maintenance allowance if the CTS Note.

These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as more restrictive because less time is allowed in the ITS for the RTB to be bypassed than was allowed in the CTS.

M14 CTS Table TS 3.5-2 lists the Permissive/Interlock but does not specify any testing requirements. CTS Table TS 4.1-1 and TS 4.1-3 list the testing requirements for instrumentation, but do not list any specific testing requirements for the Permissive/Interlocks. ITS Table 3.3.1-1 requires performance of CHANNEL CALIBRATION (ITS SR 3.3.1.11) for the Intermediate Range Neutron Flux, P-6 (Function 16.a); the Power Range Neutron Flux, P-8 (Function 16.c); and the Power Range Neutron Flux, P-10 (Function 16.d). ITS Table 3.3.1-1 requires performance of a COT for the Intermediate Range Neutron Flux, P-6 (Function 16.a) every 18 months. Additionally, ITS Table 3.3.1-1 requires performance of an ACTUATION LOGIC TEST (ITS SR 3.3.1.5) for the Power Range Neutron Flux, P-7 (Function 16.b). ITS SR 3.3.1.5 requires performance of an ACTUATION LOGIC TEST (as modified by the Note to the SR) every 92 days on a STAGGERED TEST BASIS. ITS SR 3.3.1.11 requires performance of CHANNEL CALIBRATION in accordance with the Setpoint Control Program every 18 months. This surveillance is modified by a Note which excludes the neutron detectors from the CHANNEL CALIBRATION. ITS SR 3.3.1.13 requires performance of a COT every 18 months. This changes the CTS by requiring performance of a COT, CHANNEL CALIBRATION and an ACTUATION LOGIC TEST on the Permissive/Interlocks that was not required in the CTS.

The addition of these test is acceptable because the COT, CHANNEL CALIBRATION and ACTUATION LOGIC TEST will verify that the Permissive/Interlocks are functioning properly and will perform their required safety functions. A COT injects a signal into the channel to verify the OPERABILITY of all the devices. A CHANNEL CALIBRATION adjusts the output of the channel so that it will respond within the parameters that the channel monitors. An ACTUATION LOGIC TEST verifies that the output logic is

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appropriate for the input parameters. This change is designated as more restrictive because Surveillance Requirements are being added to the ITS that were not required in the CTS.

M15 The CTS has no specific requirements for the Turbine Trip - Fluid Oil Pressure Low and Turbine Trip - Turbine Stop Valve Closure reactor trips, except for a line item in CTS 2.3.a.7, which only specifies that there is a turbine trip. ITS Table 3.3.1-1 provides the requirements for these two trips (Functions 20.a and 20.b), including the number of required channels, the Applicability, an ACTION to take if a channel is inoperable (ACTION S), and Surveillance Requirements (ITS SR 3.3.1.10 and SR 3.3.1.15). This changes the CTS by adding specific requirements for the Turbine Trip - Fluid Oil Pressure Low and Turbine trip - Turbine Stop Valve Closure reactor trip Functions.

The Turbine Trip Functions anticipate the loss of heat removal capabilities of the secondary system following a turbine trip. While these trip Functions are not assumed in any accident or transient in the USAR, they act to minimize the pressure/temperature transient on the reactor and act as a backup trip to the Pressurizer Pressure - High reactor trip. These Functions, including the associated ACTION and Surveillance Requirements, are being added to the KPS ITS consistent with the fourth DEK response to NRC question KAB-035. In addition, the proposed ACTION (ITS 3.3.1 ACTION S) when a channel is inoperable is based upon WCAP-14333. DEK has performed an evaluation associated with the WCAP to justify the new ACTION. This change is designated as more restrictive because new requirements are being included in the ITS related to the Turbine Trip reactor trip that are not 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 TS 3.5-2 has four columns stating various requirements for each Functional Unit. These columns are titled "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," "MINIMUM OPERABLE CHANNELS," and "MINIMUM DEGREE OF REDUNDANCY." ITS Table 3.3.1-1 does not contain the "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," and "MINIMUM DEGREE OF REDUNDANCY" columns. This changes the CTS by moving the information provided in the "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," and "MINIMUM DEGREE OF REDUNDANCY" columns to the Bases. Note that Discussion of Changes M01 describes the changes to the number of channels required by the LCO and Discussion of Change A03 describes the change in the title of the "MINIMUM OPERABLE CHANNELS" column.

The removal of these details, which relate to system design, from the Technical Specifications is acceptable because this type of information is not necessary to

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be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still maintains the requirement for the number of required channels (which includes all of the installed channels) and the appropriate Condition to enter if a required channel is inoperable. 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 design is being removed from the Technical Specifications.

LA02 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, USAR, ODCM, NFQAPD, CLRT Program, IST Program, ISI Program, or Setpoint Control Program)* CTS Table TS 3.5-2 Notes contains Setting Limits for Permissive/Interlocks P-6, P-7, P-8, and P-10. CTS 2.3.a.1 specifies the reactor trip settings for Nuclear Flux instrumentation. CTS 2.3.a.2 specifies the reactor trip settings for the pressurizer. CTS 2.3.a.3.A specifies Reactor Coolant Temperature – Overtemperature settings. CTS 2.3.a.3.B specifies Reactor Coolant Temperature Overpower settings. CTS 2.3.a.4 specifies the Reactor Coolant Flow settings. CTS 2.3.a.5 specifies the Steam Generator settings. CTS 2.3.a.6 specifies the Reactor Trip Interlock settings. CTS 2.3.a.7 specifies other Trips which include Undervoltage trip, turbine trip, manual trip, and safety injection trip. ITS 3.3.1 does not contain Setting Limits for the RPS instrumentation. This changes the CTS by moving the Setting Limits and the reactor trip settings for Nuclear Flux instrumentation, pressurizer, Reactor Coolant Temperature, Steam Generator, Undervoltage trip, and safety injection trip to the Setpoint Control Program. Note that there are no Setting Limits for the Turbine Trip or the Manual Trip, thus no settings are being moved; only the line item is being deleted.

The removal of these Setting Limit values from the Technical Specifications and the subsequent addition of the methodology that controls changes to the Setting Limit values to ITS 5.5.16 will provide adequate protection of public health and safety. This change is acceptable because the removed information (i.e., the actual setting limits for the RPS Instrumentation) will be located in the Kewaunee Setpoint Control Program. The Kewaunee setpoint methodology provides a means for processing changes to instrumentation setpoints, which is controlled by the Setpoint Control Program contained in ITS 5.5.16. The ITS 5.5.16 Setpoint Control Program identifies the NRC approved setpoint methodology and requires that the Allowable Values, Nominal Trip Setpoints, and As-Found and As-Left Tolerances be calculated using this NRC approved setpoint methodology. Changes to the Kewaunee setpoint methodology are made under 10 CFR 50.59, which ensures that changes are properly evaluated. This change is designated as a less restrictive removal of detail change because Allowable Value/Setpoint Information is being removed from the Technical Specifications and relocated to the Kewaunee Setpoint Control Program.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Note (a) to CTS Table TS 4.1-1 Channel Description 1 (Nuclear Power Range) in the Remarks Section states that the weekly Channel Check

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contains a heat balance. Note (b) to CTS Table TS 4.1-1 Channel Description 1 in the Remarks Section states that the monthly CHANNEL FUNCTIONAL TEST contains the signal to ΔT and bistable action (permissive, rod stop, and trips). Note (c) to CTS Table TS 4.1-1 Channel Description 1 in the Remarks Section states that the Effective Full Power quarterly CHANNEL CALIBRATION contains upper and lower chambers for axial off-set using incore detectors. ITS 3.3.1 does not contain these requirements. This changes the CTS by moving these details to the Bases.

The removal of these details, which relate 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 maintains the requirement perform a CHANNEL CHECK, TADOT/COT, and CHANNEL CALIBRATION of the Nuclear Power Range instrumentation. 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 design is being removed from the Technical Specifications.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Note (b) to CTS Table TS 4.1-1 Channel Description 2 (Nuclear Intermediate Range) in the Remarks Section states that the CHANNEL FUNCTIONAL TEST contains the bistable action (permissive, rod stop, and trips). ITS 3.3.1 does not contain these requirements. This changes the CTS by moving these details to the Bases.

The removal of these details, which relate 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 maintains the requirement to perform a TADOT/COT of the Nuclear Intermediate Range instrumentation. 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 design is being removed from the Technical Specifications.

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Note (b) to CTS Table TS 4.1-1 Channel Description 3 (Nuclear Source Range) in the Remarks Section states that the CHANNEL FUNCTIONAL TEST contains the bistable action (alarms and trips). ITS 3.3.1 does not contain these requirements. This changes the CTS by moving these details to the Bases.

The removal of these details, which relate to system design, from the Technical Specifications is acceptable because this type of information is not necessary to

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be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still maintains the requirement to perform a TADOT/COT of the Nuclear Source Range instrumentation. 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 design is being removed from the Technical Specifications.

LA06 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS Table TS 4.1-3 Equipment Test 1.c requires testing the Reactor Trip Breaker by opening of the reactor trip and bypass breakers. This test is modified by a footnote (3) which requires the use of the Control Rom push-button to independently test the reactor trip and undervoltage trip attachments. It also requires verification of the undervoltage trip attachment on the reactor trip bypass breakers. ITS SR 3.3.1.14 does not contain the requirements in the footnote. This changes the CTS by moving these details to the Bases.

The removal of these 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 still maintains the requirement to perform a TADOT of the Nuclear Reactor Trip Breakers. 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 design is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 3 (Nuclear Flux Intermediate Range), Column 3 requires one Nuclear Flux Intermediate Range channel to be OPERABLE. If both of the Nuclear Flux Intermediate Range channels are inoperable, then Table TS 3.5-2 Functional Unit 3 Column 6 requires maintaining HOT SHUTDOWN. Since there is no required action to take when there are two Nuclear Flux Intermediate Range channels, CTS 3.0.c must be entered. CTS 3.0.c requires action to be initiated within 1 hour and to be in HOT STANDBY (equivalent to ITS MODE 2) in the following 6 hours and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the following 6 hours. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 4 requires two Nuclear Flux Intermediate Range channels to be OPERABLE. ITS 3.3.1 ACTION G provides compensatory

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actions to take with two Intermediate Range Neutron Flux channels inoperable and requires suspension of operations involving positive reactivity additions immediately, but allows limited plant cooldown or boron dilution provided that the change is accounted for in the calculated SDM and reduction of THERMAL POWER to < P-6 within 2 hours. This changes the CTS by allowing suspension of operation involving positive reactivity additions and reduction of THERMAL POWER instead of placing the unit in HOT SHUTDOWN.

This change is acceptable because the Required Actions require the unit to be placed in a condition where the Intermediate Range Nuclear Flux channels are no longer required to be OPERABLE. The proposed ACTION precludes a power level increase and allows a reasonable period of time for a slow and controlled power adjustment with no Intermediate Range channels OPERABLE. The ITS requires the actions of precluding positive reactivity additions and reducing power. These remedial actions are for safe operation. This change is designated as less restrictive because less stringent Required Actions are being applied.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 17 (Reactor Trip Breaker (RTB)), Column 3 requires two RTB channels to be OPERABLE. If one RTB channel is inoperable, then Table 3.5-2 Column 6 requires maintaining HOT SHUTDOWN and opening of the RTBs. Table 3.5-2 Column 5 also contains a Note that says that the RTBs may be bypassed for up to 8 hours for surveillance testing or maintenance. ITS LCO 3.3.1 requires the RPS instrumentation in Table 3.3.1-1 to be OPERABLE. ITS Table 3.3.1-1 Function 17 requires two Reactor Trip Breaker (RTB) trains to be OPERABLE. ITS 3.3.1 ACTION O provides compensatory actions to take with one RTB train inoperable and requires restoring the RTB train to OPERABLE status within 24 hours or to be in MODE 3 within 30 hours. The Required Actions are modified by a Note that allows one RTB train to be bypassed for up to 4 hours for surveillance testing, provided that the other train is OPERABLE. This changes the CTS by allowing restoration of the RTB train in lieu of opening the RTBs. Additionally it changes the CTS by allowing 30 hours to be in MODE 3 instead of the 13 hours required in the CTS and not allowing one train of RTB to be bypassed for up to 8 hours for maintenance. See DOC M13 for changes related to surveillance testing.

The purpose of the CTS Actions is to ensure proper compensatory measures are taken in the event of an inoperable RTB. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to 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, a reasonable time for repairs and replacement, and the low probability of a DBA occurring during the repair period. In the CTS, when a RTB is inoperable the unit is taken to HOT SHUTDOWN and the RTBs are opened. Under the same conditions in the ITS, the RTB train is allowed to be restored to

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OPERABLE within 24 hours. Additionally, if the RTB is restored to OPERABLE in the specified Completion Time, then entering MODE 3 (equivalent to HOT SHUTDOWN) is not required. Furthermore, when MODE 3 is required to be entered, it must be entered within 30 hours instead of the 13 hours required in the CTS. 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)* CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 17 (RTB (Independently Test Shunt and Undervoltage Attachments)), Column 3 requires two RTB (Independently Test Shunt and Undervoltage Attachments) channels per breaker to be OPERABLE. If one RTB (Independently Test Shunt and Undervoltage Attachments) channel per breaker is inoperable, then Table 3.5-2 Column 6 allows 72 hours before maintaining HOT SHUTDOWN and opening of the RTBs. ITS Table 3.3.1-1 Function 18 requires two Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms per RTB to be OPERABLE. ITS 3.3.1 ACTION R provides compensatory actions to take with one RTB Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms per RTB inoperable and requires restoration of the inoperable trip mechanism to OPERABLE status within 48 hours or to be in MODE 3 within 54 hours. This changes the CTS by not requiring the RTBs to be opened when in MODE 3 (CTS equivalent HOT SHUTDOWN) after 72 hours.

The purpose of the CTS Actions is to ensure proper compensatory measures are taken in the event of an inoperable RTB (Independently Test Shunt and Undervoltage Attachments). 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, a reasonable time for repairs and replacement, and the low probability of a DBA occurring during the repair period. In the CTS, when a RTB (Independently Test Shunt and Undervoltage Attachments) channel per breaker is inoperable after 72 hours the RTBs must be open and the unit must be placed in HOT SHUTDOWN. Under the same conditions in the ITS, once MODE 3 is attained, the RTBs are allowed to remain closed. This is acceptable since the reactor is shutdown. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(Category 4 – Relaxation of Required Action)* CTS Table 3.5-2 requires the Permissive/Interlocks to be OPERABLE. However, no specific ACTIONS are provided for when an interlock is inoperable. Therefore, all affected RPS instrumentation would be declared inoperable and CTS 3.0.c would be entered. CTS 3.0.c requires action to be initiated within 1 hour, to be in HOT STANDBY (equivalent to ITS MODE 2) in the next 6 hours, and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the following 6 hours. ITS Table 3.3.1-1 Function 16.a requires two Intermediate Range Neutron Flux, P-6 channels to be OPERABLE. ITS Table 3.3.1-1 Function 16.d requires four Power Range

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Neutron Flux, P-10 channels to be OPERABLE. ITS 3.3.1 ACTION P provides compensatory actions to take with one or more Intermediate Range Neutron Flux, P-6 channels or Power Range Neutron Flux, P-10 channels are inoperable and requires verification that the interlock is in the required state for existing unit conditions within 1 hour or to be in MODE 3 within 7 hours. ITS Table 3.3.1-1 Function 16.b requires four Low Power Reactor Trips Blocks, P-7 channels to be OPERABLE. ITS Table 3.3.1-1 Function 16.c requires four Power Range Neutron Flux, P-8 channels to be OPERABLE. ITS Table 3.3.1-1 Function 16.e requires two Turbine Impulse Pressure, P-13 channels to be OPERABLE. ITS 3.3.1 ACTION Q provides compensatory actions to take with one or more Power Range Neutron Flux, P-7 channel per train, Power Range Neutron Flux, P-8 channels, or Turbine Impulse Pressure, P-13 channels are inoperable and requires verification that the interlock is in the required state for existing unit conditions within 1 hours or to be in MODE 2 within 7 hours. This changes the CTS by allowing continued operation as long as the interlock is placed in the correct state for existing unit operation and providing actions if the inoperable interlock is not placed in the correct state.

The purpose of the interlocks is to ensure the associated RPS instrumentation is automatically enabled or disabled when required. This change is acceptable since the proposed ACTIONS ensure that the interlock is either manually placed in the correct state for the existing unit conditions or that the unit is placed in a MODE or specified Condition outside the Applicability of the associated interlock. ITS 3.3.1 Required Action P.1 and Q.1 require the interlock to be placed in the same state as it would be normally placed in if it were automatically functioning (i.e., this performs the intended function of the interlock). If the Required Action is not accomplished within 1 hour, then Required Action P.2 and Q.2 require the unit to be placed in a MODE that is outside of the Applicability of the associated interlock. 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 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Description 1 requires a CHANNEL FUNCTIONAL TEST of the Nuclear Power Range channels (High Setting, Positive Setting, and Negative Setting) to be performed monthly as stated in Remarks (b). CTS Table TS 4.1-1 Channel Description 4 requires a CHANNEL FUNCTIONAL TEST of the Overtemperature ΔT and the Overpower ΔT channels to be performed monthly. CTS Table TS 4.1-1 Channel Description 5 requires a CHANNEL FUNCTIONAL TEST of the Reactor Coolant Flow channels to be performed monthly. CTS Table TS 4.1-1 Channel Description 6 requires a CHANNEL FUNCTIONAL TEST of the Pressurizer Water Level channels to be performed monthly. CTS Table TS 4.1-1 Channel Description 7 requires a CHANNEL FUNCTIONAL TEST of the Pressurizer Pressure channels to be performed monthly. CTS Table TS 4.1-1 Channel Description 11.a requires a CHANNEL FUNCTIONAL TEST of the Steam Generator Low Level channels to be performed monthly. CTS Table TS 4.1-1 Channel Description 12 requires a CHANNEL FUNCTIONAL TEST of the Steam Generator Flow Mismatch channels to be performed monthly. ITS Table 3.3.1-1 Functions 2.a (Power Range Neutron Flux – High), 3.a (Power Range Neutron Flux Rate – High Positive Rate), 3.b (Power Range Neutron Flux Rate – High Negative Rate), 6 (Overtemperature ΔT), 7 (Overpower ΔT), 8.a

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(Pressurizer Pressure – Low), 8.b (Pressurizer Pressure – High), 9 (Pressurizer Water Level – High), 10 (Reactor Coolant Flow – Low), 14 (Steam Generator (SG) Water Level – Low Low), and 15 (SG Water Level – Low and SG Water Level – Low – Coincident with Steam Flow/Feedwater Flow Mismatch) requires performance of a COT (ITS SR 3.3.1.7) every 184 days. Additionally, this Surveillance Requirement is modified by a Note, which states that the SR is not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. This changes the CTS by changing the frequency of the Surveillances from monthly and quarterly to 184 days and allowing performance of the source range instrumentation COT to be delayed until 4 hours after entering MODE 3. See DOC A06 for discussion on changing the CHANNEL FUNCTIONAL TEST to COT.

The purpose of the CHANNEL FUNCTIONAL TEST/COT is to ensure that the instrumentation is functioning properly. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

L06 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Description 1 requires a CHANNEL FUNCTIONAL TEST of the Nuclear Power Range channels (25% reactor trip, i.e., the Low Setting) to be performed quarterly as stated in Remarks (d). CTS Table TS 4.1-1 Channel Description 2 requires a CHANNEL FUNCTIONAL TEST of the Nuclear Intermediate Range channels prior to each startup if not done the previous week. CTS Table TS 4.1-1 Channel Description 3 requires a CHANNEL FUNCTIONAL TEST of the Nuclear Source Range channels prior to each startup if not done the previous week. ITS Table 3.3.1-1 Functions 2.b (Power Range Neutron Flux – Low), 4 (Intermediate Range Neutron Flux), and 5 (Source Range Neutron Flux) require performance of ITS SR 3.3.1.8. ITS SR 3.3.1.8 requires performance of COT in accordance with the Setpoint Control Program prior to reactor startup and four hours after reducing power below P-6 for source range instrumentation and twelve hours after reducing power below P-10 for power and intermediate range instrumentation and every 184 days thereafter. Additionally, the Frequency contains a Note, which states that the surveillance is only required to be performed when not performed within the previous 184 days. Additionally, the Surveillance Requirement itself is modified by a Note that says that this Surveillance shall include verification that the P-6 and P-10 interlocks are in their required state for existing unit conditions. This changes the CTS by requiring the performance of a COT for the Nuclear Power Range channels every 184 days instead of the monthly and quarterly requirements of CTS.

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The purpose of the CHANNEL FUNCTIONAL TEST/COT is to ensure that the instrumentation is functioning properly. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

L07 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS Table TS 4.1-1 Channel Description 1 requires a CHANNEL CHECK every Effective Full Power Month, but Remark (c) states that the check for axial offset shall be performed prior to > 75% power following any core alterations. CTS Table TS 4.1-1 Channel Description 1 requires a CHANNEL CALIBRATION every Effective Full Power Quarter, but Remark (c) states that the check for axial offset shall be performed prior to > 75% power following any core alterations. ITS SR 3.3.1.3 requires comparing the results of the incore detector measurements to Nuclear Instrumentation (NIS) AFD with an adjustment of the NIS channel if the absolute difference is ≥ 3%. This Surveillance Requirement is modified by a Note which allows the SR to not be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. ITS SR 3.3.1.6 requires calibration of excore channels to agree with the incore detector measurements. This Surveillance also contains a Note, which allows the SR to not be performed until 24 hours after THERMAL POWER is ≥ 50% RTP. This changes the CTS by specifically requiring a comparison of the results of the incore detector measurements to the NIS AFD and allowing the SR to be performed 24 hours after THERMAL POWER is ≥ 15% RTP instead of performing the CTS required CHANNEL CHECK. Additionally, this changes the CTS by specifically requiring a calibration of the excore channels to agree with the incore detector measurements instead of a CHANNEL CALIBRATION.

The purpose of the excore to incore check and calibration is to ensure that the excore detectors are accurately measuring power. This change adds two explicit Surveillances. One is to compare the results of the incore detector measurements to Nuclear Instrumentation (NIS) AFD with an adjustment of the NIS channel if the absolute difference is ≥ 3% every 31 effective full power days with a Note which allows the performance of the Surveillance to be delayed until 24 hours after THERMAL POWER is ≥ 15% RTP. The other is to calibrate the excore channels to agree with the incore detector measurements every 92 effective full power days with a Note which allows the performance of the Surveillance to be delayed until 24 hours after THERMAL POWER is ≥ 50% RTP. This change is acceptable since the proposed Surveillances are consistent with the intent of the current allowance and ensures the incore to excore detector calibration is performed periodically. Additionally, although it is

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possible to exceed the 75% RTP requirement stated in the CTS by allowing 24 hours after reaching ≥ 15% RTP, for SR 3.3.1.3, and ≥ 50% RTP, for SR 3.3.1.6, this is acceptable since it will allow sufficient time for the instrumentation to stablize before performing the required check or calibrations. SR 3.3.1.3 and SR 3.3.1.6 are performed to compute the f_1 (delta I) input to the Overtemperature ΔT Function. This change is designated as less restrictive because with the ITS allowance for delay could cause the Surveillance to exceed the 75% RTP restriction imposed by the CTS.

L08 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table TS 4.1-1 Channel Description 24 requires a TEST of the Turbine First Stage Pressure every month. ITS Table 3.3.1-1 Function 16.e (Reactor Trip System Interlocks – Turbine Impulse Pressure – P-13) requires performance of a COT (ITS SR 3.3.1.13) every 18 months. This changes the CTS by requiring the performance of the COT for the Turbine First Stage Pressure every 18 months instead of the monthly requirement of CTS.

The purpose of the TEST/COT is to ensure that the permissive is functioning properly. This change extends the CTS requirement to perform the P13 permissive test from monthly to every 18 months. This change is acceptable because the Frequency is based on the known reliability of the interlocks and multichannel redundancy. Additionally, the proposed Frequency is reasonable, based on operating experience, for these relays. This change is designated as less restrictive because less stringent Frequencies are applied in the ITS than were applied in the CTS.

L09 *(Category 9 – Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Description 26 requires a TEST of the Protective System Logic Channel Testing every month. ITS Table 3.3.1-1 Function 19 (Automatic Trip Logic) requires performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS (ITS SR 3.3.1.5). This changes the CTS by requiring the performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS instead of the monthly requirement of CTS.

The purpose of the TEST/ACTUATION LOGIC TEST is to ensure that the instrumentation is functioning properly. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

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L10 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Description 8a requires a TEST of the 4-KV Voltage and 4-KV Frequency to be performed monthly. ITS Table 3.3.1-1 Functions 12 (Undervoltage RCPs) and 13 (Underfrequency RCPs) requires performance of a TADOT (ITS SR 3.3.1.9) every 92 days. This changes the CTS by changing the Frequency of the Surveillances from monthly to 92 days.

The purpose of the TEST/TADOT is to ensure that the instrumentation is functioning properly. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

L11 *(Category 5 – Deletion of Surveillance Requirement)* Note 1 to CTS Table TS 4.1-3 requires, in part, that the Reactor Trip Breakers, Reactor Coolant Pump Breakers – Open – Reactor Trip, and Manual Reactor Trip be tested to verify OPERABILITY following maintenance on equipment that could affect the operation. ITS 3.3.1 does not include this requirement. This changes the CTS by eliminating a post maintenance Surveillance Requirement.

This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and frequency necessary to give confidence that the equipment can perform its assumed safety function. Whenever, the OPERABILITY of a system or component has been affected by repair, maintenance, modification, or replacement of a component, post maintenance testing is required to demonstrate the OPERABILITY of the system or component. This is described in the Bases for ITS SR 3.0.1 and required under SR 3.0.1. In addition, the requirement of 10 CFR 50, Appendix B, Section XI (Test Control), provides adequate controls for test programs to ensure that testing incorporates applicable acceptance criteria. Compliance with 10 CFR 50, Appendix B is required under the unit operating license. As a result, post-maintenance testing will continue to be performed and an explicit requirement in the Technical Specifications is not necessary. This change is designated as less restrictive because a Surveillance which is required in the CTS will not be performed in the ITS.

L12 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS 3.5.d states, in part, that in the event of subsystem instrumentation channel failure permitted by CTS 3.5.b, then Table TS 3.5-2 does not need to be observed for approximately 4 hours

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

while the operable channels are tested, as long as the failed channel is blocked to prevent an unnecessary reactor trip. ITS 3.3.1 ACTION D, which provides the actions when one Power Range Neutron Flux – High channel is inoperable, includes a Note that states the inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. ITS 3.3.1 ACTION E, which provides the actions when one channel of the Power Range Neutron Flux – Low, Power Range Neutron Flux Rate – High Positive Rate, Power Range Neutron Flux Rate – High Negative Rate, Overtemperature ΔT, Overpower ΔT, Pressurizer Pressure – High, Steam Generator (SG) Water Level – Low Low, SG Water Level – Low, or SG Water Level – Low Coincident with Steam Flow/Feedwater Flow Mismatch Function is inoperable, includes a Note that states the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ITS 3.3.1 ACTION K, which provides the actions when one channel of the Pressurizer Pressure - Low, Pressurizer Water Level – High, Reactor Coolant Flow – Low, Undervoltage RCPs, or Underfrequency RCPs Function is inoperable, includes a Note that states the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. This changes the CTS by allowing an inoperable channel to be bypassed 12 hours to perform surveillance testing of other channels instead of the 4 hours allowed in the CTS.

The purpose of CTS 3.5.d is to allow time to perform testing of the operable subsystem channels without entering into the requirements specified in Table TS 3.5-2. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the testing of channels than was allowed in the CTS.

L13 *(Category 4 – Relaxation of Required Actions)* CTS Table TS 3.5-2 Note (4) requires the Reactor Coolant Pump Breakers to be OPERABLE, since they provide the direct reactor trip signal when the Underfrequency 4-kV Bus channels trip. However, CTS 3.5.2 does not provide any explicit Actions to take when the Reactor Coolant Pump Breakers are inoperable in either single loop or two loop operation. Since these channels support the Underfrequency 4-kV Bus channels, KPS would take the Column 6 actions for inoperable Underfrequency 4-kV Bus channels. This action requires the plant to be maintained in HOT SHUTDOWN. Since there is no time limit to attain HOT SHUTDOWN, KPS uses the times from CTS 3.0.c. CTS 3.0.c requires action to be initiated within 1 hour and to be in HOT STANDBY (equivalent to ITS MODE 2) in the next 6 hours and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the following 6 hours. ITS Table 3.3.1-1 Function 11.a requires one Reactor Coolant Pump (RCP) Breaker Position channel per RCP to be OPERABLE in single loop operation.

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

ITS 3.3.1 ACTION L provides compensatory actions to take when one Reactor Coolant Pump Breaker Position channel is inoperable in single loop operation, and requires the restoration of the channel to OPERABLE status within 6 hours or the reduction of THERMAL POWER to below P-8 within 10 hours. Additionally, ACTION L contains a Note which allows the inoperable channel to be bypassed for up to 4 hours for surveillance testing of other channels. ITS Table 3.3.1-1 Function 11.b requires one RCP Breaker Position channel per RCP to be OPERABLE in two loop operation. ITS 3.3.1 ACTION M provides compensatory actions to take when one Reactor Coolant Pump Breaker Position channel is inoperable in two loop operation and requires placing the inoperable channel in trip within 6 hours or the reduction of THERMAL POWER to below P-7 within 12 hours. Additionally, ACTION M contains a Note which allows the inoperable channel to be bypassed for up to 4 hours for surveillance testing of other channels. This changes the CTS by adding specific ACTIONS to take with an inoperable channel of the Reactor Coolant Pump Breaker Position when in single or two loop operation. See DOC A11 for discussion of the Applicability and required channels.

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 the inoperable feature. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features, a reasonable time for repairs and replacement, and the low probability of a DBA occurring during the repair period. Additionally, if the degraded condition cannot be corrected, the Required Actions place the unit in a MODE where the RCP Breaker Position reactor trip function is not required to be OPERABLE. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L14 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS 3.5 does not provide any explicit Actions to take when the Protective System Logic Channels are inoperable. However, since the RPS Protective System Logic Channels support OPERABILITY of the RPS trip channels, when one or more of the RPS Protective System Logic Channels are inoperable, KPS declares the associated RPS trip channels inoperable and takes the appropriate actions required by CTS Table TS 3.5-2, i.e., maintain HOT SHUTDOWN. Since there is no time limit to attain HOT SHUTDOWN, KPS uses the times from CTS 3.0.c. CTS 3.0.c requires action to be initiated within 1 hour, to be in HOT STANDBY (equivalent to ITS MODE 2) in the next 6 hours, and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the following 6 hours. ITS Table 3.3.1-1 Function 19 requires two trains of the Automatic Trip Logic to be OPERABLE in MODES 1 or 2 (as discussed in DOC A12). ITS 3.3.1 ACTION N provides the compensatory actions to take when one train of the Automatic Trip Logic is inoperable, and requires restoration of the train to OPERABLE status within 24 hours or to be in MODE 3 within 30 hours. Additionally, ACTION N contains a Note which allows the inoperable channel to be bypassed for up to 4 hours for surveillance testing of other channels. This changes the CTS by adding a specific ACTION to take when one train of the Protective System Logic is inoperable in MODES 1 and 2.

DISCUSSION OF CHANGES
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See DOC A12 for discussion of the Applicability and required channels and see DOC M12 for MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted Applicability.

The purpose of the proposed ACTION is to allow some time to restore the inoperable train prior to requiring a unit shutdown. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L15 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table TS 4.1-1 Channel Description 1, Remark d) states, in part, that Permissives P8 and P10 are tested quarterly. ITS Table 3.3.1-1 Functions 16.c (Power Range Neutron Flux, P-8) and 16.d (Power Range Neutron Flux, P-10) requires performance of COT (SR 3.3.1.13) every 18 months. This changes the CTS by extending the Surveillance Frequency from quarterly to 18 months. See DOC A06 for discussion of the CTS TEST to the ITS COT.

The purpose of the TEST/COT is to ensure that the permissives are functioning properly. This change extends the CTS requirement to perform the P8 and P10 permissive test from quarterly to every 18 months. This change is acceptable because the frequency is based on the known reliability of the interlocks and multichannel redundancy. Additionally, the proposed frequency is reasonable, based on operating experience, for these relays. This change is designated as less restrictive because less stringent Frequencies are applied in the ITS than were applied in the CTS.

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

CTS

All changes are 1 unless otherwise noted

3.3 INSTRUMENTATION

3.3.1 Reactor Trip Protection System (RTS) Instrumentation P

LCO 3.3.1 The RTS P instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

--NOTE--

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.5.c	A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s) or train(s).	Immediately
DOC M01	B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status. OR B.2 Be in MODE 3.	48 hours 54 hours
DOC M09, DOC M12	C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status. OR C.2.1 Initiate action to fully insert all rods. AND	48 hours 48 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M09	C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal. `	49 hours
3.5.d, DOC M02 D. One Power Range Neutron Flux - High channel inoperable.	[-------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. --- ----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability. One channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment. ---] 9	
	D.1.1 Place channel in trip.	72 hours
	AND	
	D.1.2 Reduce THERMAL POWER to ≤ 75% RTP.	78 hours
	OR	
	D.2.1 Place channel in trip.	72 hours
	AND	

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All changes are 1 unless otherwise noted

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.5.d, DOC M02		D.2.2 --------------NOTE-------------- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. ------------------------------------- Perform SR 3.2.4.2.	Once per 12 hours	
		OR		
		D.3 Be in MODE 3.	78 hours	
3.5.d, DOC M03	E. One channel inoperable.	[------------------NOTE------------------ The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. --		
		----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability: One channel may be bypassed for up to 12 hours for surveillance testing. --]		9
		E.1 Place channel in trip.	72 hours	
		OR		
		E.2 Be in MODE 3.	78 hours	
DOC M04	F. One Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6.	24 hours	
		OR		

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All changes are 1 unless otherwise noted

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	F.2 Increase THERMAL POWER to > P-10.	24 hours
DOC L01 G. Two Intermediate Range Neutron Flux channels inoperable.	G.1 --------------NOTE-------------- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. ------------------------------------- Suspend operations involving positive reactivity additions.	 Immediately
	AND	
	G.2 Reduce THERMAL POWER to < P-6.	2 hours
DOC M05 H. One Source Range Neutron Flux channel inoperable.	-------------------NOTE------------------- Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. --- H.1 Suspend operations involving positive reactivity additions.	 Immediately

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M07	I. Two Source Range Neutron Flux channels inoperable.	I.1 Open reactor trip breakers (RTBs).	Immediately
DOC M10	J. One Source Range Neutron Flux channel inoperable.	J.1 Restore channel to OPERABLE status. OR J.2.1 Initiate action to fully insert all rods. AND J.2.2. Place the Rod Control System in a condition incapable of rod withdrawal.	48 hours 48 hours 49 hours
3.5.d, DOC M14	K. One channel inoperable.	[-------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. --- ----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability: One channel may be bypassed for up to 12 hours for surveillance testing. ---] K.1 Place channel in trip. OR	 72 hours

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	K.2 Reduce THERMAL POWER to < P-7.	78 hours
DOC L13 L. One Reactor Coolant Pump Breaker Position (Single Loop) channel inoperable.	--------------------NOTE------------------- The inoperable channel may be bypassed for up to [4] hours for surveillance testing of other channels. ---	2
	L.1 Restore channel to OPERABLE status.	[6] hours 2
	OR	
	L.2 Reduce THERMAL POWER to < P-8.	[10] hours 2
DOC L13 M. One Reactor Coolant Pump Breaker Position (Two Loops) channel inoperable.	--------------------NOTE------------------- The inoperable channel may be bypassed for up to [4] hours for surveillance testing of other channels. ---	6 2
	M.1 Place the channel in trip.	[6] hours 2
	OR	
	M.2 Reduce THERMAL POWER to <P-7.	[12] hours 2

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All changes are 1 unless otherwise noted

RTS Instrumentation
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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M15 N. One Turbine Trip channel inoperable. (S)	[-------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. --	10
Move to after ACTION R on Page 3.3.1-9	----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability. One channel may be bypassed for up to 12 hours for surveillance testing. --]	9
	N.1 Place channel in trip. (S)	72 hours 10
	OR	
	N.2 Reduce THERMAL POWER to < [P-9]. (7)	76 hours 10
DOC L14 O. One train inoperable. (N)	-------------------NOTE------------------- One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. --	4 2
	O.1 Restore train to OPERABLE status. (N)	24 hours 4
	OR	
	O.2 Be in MODE 3. (N)	30 hours 4

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All changes are 1 unless otherwise noted

RTS Instrumentation
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ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Table TS 3.5-2 Functional Unit 17	O. One RTB train inoperable.	--------------------NOTE------------------ One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ---			4
		O.1	Restore train to OPERABLE status.	[24] hours	4 2
		OR			
		O.2	Be in MODE 3.	[30] hours	4 2
DOC L04	P. One or more channels inoperable.	P.1	Verify interlock is in required state for existing unit conditions.	1 hour	4
		OR			
		P.2	Be in MODE 3.	7 hours	4
DOC L04	Q. One or more channels inoperable.	Q.1	Verify interlock is in required state for existing unit conditions.	1 hour	4
		OR			
		Q.2	Be in MODE 2.	7 hours	4

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All changes are 1 unless otherwise noted

RTS Instrumentation
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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
S. One trip mechanism inoperable for one RTB.	S.1	Restore inoperable trip mechanism to OPERABLE status.	48 hours
	OR		
	S.2	Be in MODE 3.	54 hours

Table TS 3.5-2 Functional Unit 17

R

4

Move ACTION S here from Page 3.3.1-7

SURVEILLANCE REQUIREMENTS

P

---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	----------------------------NOTE------------------------------ Not required to be performed until [12] hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculations results exceed power range channel output by more than +2% RTP.	24 hours

Table TS 4.1-1 Channel Descriptions 1, 7, 11.a, 12, 24, DOC M10

Table TS 4.1-1 Channel Description 1

2

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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
Table TS 4.1-1 Channel Description 1	SR 3.3.1.3	----------NOTE---------- Not required to be performed until [24] hours after THERMAL POWER is ≥ [15]% RTP. -------------------- Compare results of the incore detector measurements to Nuclear Instrumentation System (NIS) AFD. Adjust NIS channel if absolute difference is ≥ 3%.	31 effective full power days (EFPD)	2
Table TS 4.1-3 Equipment Test 1.a	SR 3.3.1.4	----------NOTE---------- This Surveillance must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service. -------------------- Perform TADOT.	31 ~~62~~ days ~~on a STAGGERED TEST BASIS~~	11
Table TS 4.1-1 Channel Description 26	SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	92 days on a STAGGERED TEST BASIS	12

----------NOTE----------
For Function 16.b, when ≥ 10% RTP, the SR consists only of verifying the P-7 interlock is in its required state. However, all applicable requirements of an ACTUATION LOGIC TEST are required to be performed within 12 hours of reducing THERMAL POWER to < 10% RTP

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All changes are 1 unless otherwise noted

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RTS Instrumentation
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SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
Table TS 4.1-1 Channel Description 1	SR 3.3.1.6	-----------------------------NOTE------------------------------ Not required to be performed until [24] hours after THERMAL POWER is ≥ 50% RTP. -- Calibrate excore channels to agree with incore detector measurements.	[92] EFPD	2 2
Table TS 4.1-1 Channel Descriptions 1, 4, 5, 6, 7, 11.a, and 12; DOC L05; DOC M10	SR 3.3.1.7	-----------------------------NOTE------------------------------ Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -- Perform COT in accordance with the Setpoint Control Program.	184 days	5

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All changes are 1 unless otherwise noted

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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
Table TS 4.1-1 Channel Description 1, 2, and 3; DOC L06	SR 3.3.1.8	-----------------------------NOTE------------------------------ This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. --- Perform COT in accordance with the Setpoint Control Program.	--------NOTE-------- Only required when not performed within previous 184 days ------------------------ Prior to reactor startup AND Four hours after reducing power below P-6 for source range instrumentation AND [Twelve] hours after reducing power below P-10 for power and intermediate range instrumentation AND Every 184 days thereafter	5 2

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All changes are 1 unless otherwise noted

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SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
Table TS 4.1-1 Channel Description 2.a	SR 3.3.1.9	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	[92] days	2
Table TS 4.1-1 Channel Descriptions 5, 6, 7, 8.a, 11.a, 12 and 24, DOC M15	SR 3.3.1.10	~~-----NOTE----- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. -----~~ Perform CHANNEL CALIBRATION in accordance with the Setpoint Control Program.	[18] months	8 5 2
DOC M10, DOC M11, DOC M14	SR 3.3.1.11	-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ----- Perform CHANNEL CALIBRATION in accordance with the Setpoint Control Program.	[18] months	5 2
Table TS 4.1-1 Channel Description 4	SR 3.3.1.12	-----NOTE----- This Surveillance shall include verification of Reactor Coolant System resistance temperature detector bypass loop flow rate. ----- Perform CHANNEL CALIBRATION in accordance with the Setpoint Control Program.	[18] months	5 2
Table TS 4.1-1 Channel Description 1, DOC M14	SR 3.3.1.13	Perform COT.	18 months	
Table TS 4.1-3 Equipment Tests 1.b and 1.c	SR 3.3.1.14	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	[18] months	2

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All changes are 1 unless otherwise noted

RTS Instrumentation
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SURVEILLANCE REQUIREMENTS (continued)

DOC M15

SURVEILLANCE		FREQUENCY
SR 3.3.1.15	-----------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	Prior to exceeding the [P-9] interlock whenever the unit has been in MODE 3, if not performed within the previous 31 days
SR 3.3.1.16	-----------------------------NOTE------------------------------ Neutron detectors are excluded from response time testing. --- Verify RTS RESPONSE TIME is within limits.	[18] months on a STAGGERED TEST BASIS

7 2

7

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All changes are 1 unless otherwise noted

RTS Instrumentation P
3.3.1

Table 3.3.1-1 (page 1 of 7) 5
Reactor Trip System Instrumentation Protection 5

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL[(j)] TRIP SETPOINT	
								5
Table TS 3.5-2 Functional Unit 1, Table TS 4.1-3 Equipment Test 1.c , DOC M09	1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA	5
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	C	SR 3.3.1.14	NA	NA	5
	2. Power Range Neutron Flux							
Table TS 3.5-2 Functional Unit 2, Table TS 4.1-1 Channel Description 1	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [111.2]% RTP	[109]% RTP	5 7
Table TS 3.5-2 Functional Unit 2, Table TS 4.1-1 Channel Description 1	b. Low	$1^{(b)}$,2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ [27.2]% RTP	[25]% RTP	5 7
	3. Power Range Neutron Flux Rate							
Table TS 3.5-2 Functional Unit 2, Table TS 4.1-1 Channel Description 1	a. High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11	≤ [6.8]% RTP with time constant ≥ [2] sec	[5]% RTP with time constant ≥ [2] sec	5
Table TS 3.5-2 Functional Unit 2, Table TS 4.1-1 Channel Description 1	b. High Negative Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [6.8]% RTP with time constant ≥ [2] sec	[5]% RTP with time constant ≥ [2] sec	7 5
Table TS 3.5-2 Functional Unit 3, Table TS 4.1-1 Channel Description 2	4. Intermediate Range Neutron Flux	$1^{(b)}$, $2^{(c)}$	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ [31]% RTP	[25]% RTP	5

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully insert. ed 6

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

-----REVIEWER'S NOTE-----

~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 5

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All changes are 1 unless otherwise noted

RTS Instrumentation P
3.3.1

Table 3.3.1-1 (page 2 of 7) 5
Reactor Trip System Instrumentation Protection

5

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL[(j)] TRIP SETPOINT	
								5
Table TS 3.5-2 Functional Unit 4, Table TS 4.1-1 Channel Description 3	5. Source Range Neutron Flux	2[(d)]	2	H,I	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ [1.4 E5] cps	[1.0 E5] cps	5 7
DOC M10		3[(a)], 4[(a)], 5[(a)]	2	I,J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ [1.4 E5] cps	[1.0 E5] cps	5 7
Table TS 3.5-2 Functional Unit 5, Table TS 4.1-1 Channel Description 4	6. Overtemperature ΔT	1,2	[4]	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3.1-19)	Refer to Note 1 (Page 3.3.1-19)	5 7
Table TS 3.5-2 Functional Unit 6, Table TS 4.1-1 Channel Description 4	7. Overpower ΔT	1,2	[4]	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 2 (Page 3.3.1-20)	Refer to Note 2 (Page 3.3.1-20)	5 7
	8. Pressurizer Pressure							
Table TS 3.5-2 Functional Unit 7, Table TS 4.1-1 Channel Description 7	a. Low	1[(f)] (e)	[4]	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [1886] psig	[1900] psig	5 7
Table TS 3.5-2 Functional Unit 8, Table TS 4.1-1 Channel Description 7	b. High	1,2	[4] 3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ [2396] psig	[2385] psig	5 7
Table TS 3.5-2 Functional Unit 9, Table TS 4.1-1 Channel Description 6	9. Pressurizer Water Level - High	1[(e)]	3	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ [93.8]%	[92]%	5
Table TS 3.5-2 Functional Unit 10, Table TS 4.1-1 Channel Description 5	10. Reactor Coolant Flow - Low	1[(f)]	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [89.2]%	[90]%	5 7

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully insert. ed 6

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(e) Above the P-7 (Low Power Reactor Trips Block) interlock.

(f) Above the P-8 (Power Range Neutron Flux) interlock.

---REVIEWER'S NOTE---
(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit. 5

CTS

All changes are 1 unless otherwise noted

RTS Instrumentation P
3.3.1

Table 3.3.1-1 (page 3 of 7) 5
Reactor Trip System Instrumentation Protection

5

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT[(j)]	
Table TS 3.5-2 Functional Unit 14, Table TS 4.1-3 Equipment Test 1.a, DOC A11, DOC L13	11. Reactor Coolant Pump (RCP) BreakerPosition							5
	a. Single Loop	1[(f)]	1 per RCP	L	SR 3.3.1.14	NA	NA	5
	b. Two Loops	1[(g)] (e)	1 per RCP	M	SR 3.3.1.14	NA	NA	5
Table TS 3.5-2 Functional Unit 13, Table TS 4.1-1 Channel Description 8.a	12. Undervoltage RCPs	1[(e)]	2 [3] per bus	K	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ [4760] V	[4830] V	3 5 7
Table TS 3.5-2 Functional Unit 14, Table TS 4.1-1 Channel Description 8a	13. Underfrequency RCPs	1[(e)]	2 [3] per bus	K	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ [57.1] Hz	[57.5] Hz	3 5 7
Table TS 3.5-2 Functional Unit 12, Table TS 4.1-1 Channel Description 11a	14. Steam Generator (SG) Water Level - Low Low	1,2	3 [4 per SG]	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [30.4]%	[32.3]%	3 5 7
	15. SG Water Level - Low	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ [30.4]%	[32.3]%	5 7
Table TS 3.5-2 Functional Unit 16, Table TS 4.1-1 Channel Description 12	Coincident with Steam Flow/Feedwater Flow Mismatch	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ [42.5]% full steam flow at RTP	[40]% full steam flow at RTP	5 7
DOC M15 Move to after Function 19 on page 3.3.1-19	16 20 Turbine Trip							
	a. Low Fluid Oil Pressure	1[(h)] (e)	3	N S	SR 3.3.1.10 SR 3.3.1.15	≥ [750] psig	[800] psig	10
	b. Turbine Stop Valve Closure	1[(h)] (e)	2 4	N S	SR 3.3.1.10 SR 3.3.1.15	≥ [1]% open	[1]% open	

(e) Above the P-7 (Low Power Reactor Trips Block) interlock.

(f) Above the P-8 (Power Range Neutron Flux) interlock.

~~(g) Above the P-7 (Low Power Reactor Trips Block) interlock and below the P-8 (Power Range Neutron Flux) Interlock~~ 4

~~(h) Above the P-9 (Power Range Neutron Flux) interlock.~~ 10

~~-----REVIEWER'S NOTE-----~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~
~~----------~~ 5

CTS

All changes are 1 unless otherwise noted

RTS Instrumentation P
3.3.1

Table 3.3.1-1 (page 4 of 7) 5
Reactor Trip System Instrumentation Protection

5

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT(j)	
17. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.14	NA	NA	4 5
16 18. Reactor Trip System Interlocks (Protection)							
a. Intermediate Range Neutron Flux, P-6 (Table TS 3.5-2 Permissive/ Interlock P-6, DOC M14)	2(d)	2	P Q	SR 3.3.1.11 SR 3.3.1.13	≥ [6E-11] amp	[1E-10] amp	4 5
b. Low Power Reactor Trips Block, P-7 (Table TS 3.5-2 Permissive/ Interlock P-7, DOC M14)	1	1 per train	Q R	SR 3.3.1.5	NA	NA	4 5
c. Power Range Neutron Flux, P-8 (Table TS 3.5-2 Permissive/ Interlock P-8, Table TS 4.1-1 Channel Description 1, DOC M14)	1	4	Q R	SR 3.3.1.11 SR 3.3.1.13	≤ [50.2]% RTP	[48]% RTP	4 5
d. Power Range Neutron Flux, P-9	1	4	R	SR 3.3.1.11 SR 3.3.1.13	≤ [52.2]% RTP	[50]% RTP	4 5
e. d Power Range Neutron Flux, P-10 (Table TS 3.5-2 Permissive/ Interlock P-10, Table TS 4.1-1 Channel Description 1, DOC M14)	1,2	4	P Q	SR 3.3.1.11 SR 3.3.1.13	≥ [7.8]% RTP and ≤ [12.2]% RTP	[10]% RTP	4 5
f. e Turbine Impulse Pressure, P-13 (Table TS 3.5-2 Permissive/ Interlock P-7, Table TS 4.1-1 Channel Description 24)	1	2	Q R	[SR 3.3.1.1] SR 3.3.1.10 SR 3.3.1.13	≤ [12.2]% turbine power	10]% turbine power	2 4 5
17 19. Reactor Trip Breakers (g) (i) (RTBs) (Table TS 3.5-2 Functional Unit 17, DOC M09)	1,2	2 trains	O P	SR 3.3.1.4	NA	NA	4 5
	3(b), 4(b), 5(b)	2 trains	C	SR 3.3.1.4	NA	NA	5

(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(g) (i) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB. 4

-------------------------REVIEWER'S NOTE-------------------------

(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit. 5

CTS

All changes are 1 unless otherwise noted

RTS Instrumentation
3.3.1

Table 3.3.1-1 (page 5 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT[j]
20. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per RTB	S	SR 3.3.1.4	NA	NA
	3[b], 4[b], 5[b]	1 each per RTB	C	SR 3.3.1.4	NA	NA
21. Automatic Trip Logic	1,2	2 trains	O	SR 3.3.1.5	NA	NA
	3[b], 4[b], 5[b]	2 trains	C	SR 3.3.1.5	NA	NA

Table TS 3.5-2 Functional Unit 17, Table TS 4.1-3 Equipment Test 1.a, DOC M09

Table TS 4.1-1 Channel Description 26, DOC A12, DOC L14

Move Function 20 here from page 3.3.1-17

18 19 2 R N P 4 5 Protection

--REVIEWER'S NOTE--

(b) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.

Table 3.3.1-1 (page 6 of 7)
Reactor Trip System Instrumentation

<u>Note 1: Overtemperature ΔT</u>

The Overtemperature ΔT Function Allowable Value shall not exceed the following nominal Trip Setpoint by more than [3.8]% of ΔT span.

$$\Delta T \frac{(1+T_1 S)}{(1+T_2 S)}\left(\frac{1}{1+T_3 S}\right) \leq \Delta T_Q \left\{K_1 - K_2 \frac{(1+T_4 S)}{(1+T_5 S)}\left[T \frac{1}{(1+T_6 S)} - T'\right] + K_3 (P - P') - f_1(\Delta I)\right\}$$

Where: ΔT is measured RCS ΔT,°F.
ΔT_Q is the indicated ΔT at RTP,°F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature,°F.
T' is the nominal T_{avg} at RTP, ≤ [*]°F.

P is the measured pressurizer pressure, psig
P' is the nominal RCS operating pressure, ≥ [*] psig

K_1 ≤ [*]	K_2 ≥ [*]/°F	K_3 ≥ [*]/psig
T_1 ≥ [*] sec	T_2 ≤ [*] sec	T_3 ≤ [*] sec
T_4 ≥ [*] sec	T_5 ≤ [*] sec	T_6 ≤ [*] sec

$f_1(\Delta I)$ = [*] {[*] - (q_t - q_b)}	when q_t - q_b ≤ [*]% RTP
0% of RTP	when [*]% RTP < q_t - q_b ≤ [*]% RTP
[*] {(q_t - q_b) - [*]}	when q_t - q_b > [*]% RTP

Where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and q_t + q_b is the total THERMAL POWER in percent RTP.

*These values denoted with [*] are specified in the COLR.

5

Table 3.3.1-1 (page 7 of 7)
Reactor Trip System Instrumentation

Note 2: Overpower ΔT

The Overpower ΔT Function Allowable Value shall not exceed the following nominal Trip Setpoint by more than [3]% of ΔT span.

$$\Delta T \frac{(1+T_1 S)}{(1+T_2 S)}\left(\frac{1}{1+T_3 S}\right) \leq \Delta T_Q \left\{K_4 - K_5 \frac{T_7 S}{1+T_7 S}\left(\frac{1}{1+T_6 S}\right) T - K_6 \left[T \frac{1}{1+T_6 S} - T''\right] - f_2(\Delta I)\right\}$$

Where: ΔT is measured RCS ΔT,°F.
ΔT_Q is the indicated ΔT at RTP,°F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature,°F.
T'' is the nominal T_{avg} at RTP, ≤ [*]°F.

K_4 ≤ [*]

K_5 ≥ [*]/°F for increasing T_{avg}
[*]/°F for decreasing T_{avg}

K_6 ≥ [*]/°F when T > T''
[*]/°F when T ≤ T''

T_1 ≥ [*] sec

T_2 ≤ [*] sec

T_3 ≤ [*] sec

T_6 ≤ [*] sec

T_7 ≥ [*] sec

5

$f_2(\Delta I)$ = [*]

*These values denoted with [*] are specified in the COLR.

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

1. The ISTS 3.3.1 title, "Reactor Trip System (RTS) Instrumentation" has been changed to "Reactor Protection System (RPS) Instrumentation" consistent with the Kewaunee Power Station (KPS) site specific terminology.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

4. 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. Where a deletion has occurred, subsequent alpha-numeric designators have been changed for any applicable affected ACTIONS, SURVEILLANCE REQUIREMENTS and FUNCTIONS.

5. Changes are made to the ISTS that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. KPS has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this adoption strategy, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications. Hence the deletion of the "ALLOWABLE VALUE" and "NOMINAL TRIP SETPOINT" columns from Table 3.3.1-1 of the ITS. Included in the relocation to the licensee-controlled Setpoint Control Program is all information contained within any associated footnotes that tie to numerical values in the Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Value columns. In addition, the adoption strategy requires that each instrument surveillance requirement which verifies a LSSS (both SL and non-SL-LSSSs) contain a requirement to perform the surveillance test in accordance with the SCP. Hence, the addition of the phrase " in accordance with the Setpoint Control Program" to ITS SR 3.3.1.7, CHANNEL OPERATIONAL TEST (COT), ITS SR 3.3.1.8, COT, IST SR 3.3.1.10, CHANNEL CALIBRATION, IST SR 3.3.1.11, CHANNEL CALIBRATION, and IST SR 3.3.1.12, CHANNEL CALIBRATION.

6. Typographical error corrected.

7. The RTS RESPONSE TIME requirement, ISTS SR 3.3.1.16, has not been adopted into the KPS ITS, consistent with Kewaunee current licensing basis and current Technical Specifications. The Kewaunee USAR describes the implementation of the principles as related to the proposed IEEE-279 "Standard, Nuclear Power Plant Protection Systems," August 1968. This industry standard provides guidance and requirements for conducting periodic testing of protection systems. IEEE-279-1968 does not address response time testing. Furthermore, generic studies have shown that instrumentation response time changes

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

(increasing times), that could impact safety, do not normally vary such that they would not be detected during other required surveillances (e.g., CHANNEL CALIBRATIONS). Since the addition of these tests would be a major burden (plant design does not readily lend itself to such testing) with little gain in safety, ISTS SR 3.3.1.16 has not been added.

8. A Note to ISTS SR 3.3.1.10 requires the CHANNEL CALIBRATION to include verification that time constants are adjusted to the prescribed values. ITS SR 3.3.1.10 does not include this Note since it does not apply to any ITS Table 3.3.1-1 Functions that include time constants.

9. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. Required Actions for Conditions D, E, and K are modified by a Note that provides two options for bypassing a channel for up to 12 hours for the purpose of performing surveillance testing without requiring entry into the applicable Required Actions. One option is for plants that have installed bypass testing capabilities. The other option is for plants that do not have installed bypass testing capabilities. KPS does not have installed bypass testing capabilities. Therefore, the Note for plants that do not have bypass testing capabilities is retained for Conditions D, E, and K.

10. Based on the fourth KPS response to NRC question KAB-035, DEK has added the Turbine Trip RPS Function into the ITS submittal. Changes to the Function requirements in ITS Table 3.3.1-1 have been made based on the KPS design. The Turbine Stop Valve Closure Function does not require a CHANNEL CALIBRATION Surveillance (ISTS SR 3.3.1.10) since the Function is a limit switch. Thus, only the TADOT Surveillance (ISTS SR 3.3.1.15) has been added. In addition, both the Function number in the Table and the ACTION designator have been changed to preclude unnecessary administrative burdens since this Function and its associated ACTION have been added late in the review process.

11. ISTS Table 3.3.1-1 Functions 17 (Reactor Trip Breakers (RTBs)) and 18 (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms) requires performance of a TADOT (ISTS SR 3.3.1.4) every 62 days on a STAGGERED TEST BASIS. Based on KPS's review of 15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003, the justification used to extend the Surveillance Test Interval from monthly on a STAGGERED TEST BASIS (i.e., each breaker tested every two months) to 62 days on a STAGGERED TEST BASIS (i.e., each breaker tested every four months) is not applicable to KPS since KPS tests the breakers monthly. Therefore, ITS SR 3.3.1.4 will contain the KPS current licensing requirement and the TADOT will be performed on a 31 day frequency.

12. ISTS Table 3.3.1-1, Function 18.b, P-7 Interlock, requires SR 3.3.1.5 to be performed. SR 3.3.1.5 is an ACTUATION LOGIC TEST that is required to be performed every 92 days on a STAGGERED TEST BASIS. At KPS, this SR cannot be performed when ≥ 10% RTP, since the Turbine Impulse Pressure relays cannot be cycled at power. Therefore, a Note has been added for this Function that states "For Function 16.b, when ≥ 10% RTP, the SR consists only

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

of verifying the P-7 interlock is in its required state. However, all the applicable requirements of an ACTUATION LOGIC TEST are required to be performed within 12 hours of reducing THERMAL POWER to < 10% RTP." This will allow the SR to not be performed when ≥ 10% RTP except for verifying that the interlock is in the required state, but still require the SR to be met. Furthermore, anytime power is reduced below 10% RTP, then all requirements of an ACTUATION LOGIC TEST would either have to be current (i.e., performed within the last 92 days on a STAGGERED TEST BASIS) or be performed within 12 hours after the power reduction to below 10% RTP. In addition, prior to entering the Applicability of Function 16.b (which is MODE 1), the SR would also have to be current. This ensures the P-7 interlock is properly tested prior to entering MODE 1 and when in MODE 1 with THERMAL POWER < 10% RTP for an extended time.

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

All changes are 1 unless otherwise noted

B 3.3 INSTRUMENTATION

B 3.3.1 Reactor Trip System (RTS) Instrumentation

BASES

BACKGROUND

The RTS initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and Reactor Coolant System (RCS) pressure boundary during anticipated operational occurrences (AOOs) and to assist the Engineered Safety Features (ESF) Systems in mitigating accidents.

The protection and monitoring systems have been designed to assure safe operation of the reactor. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the RTS, as well as specifying LCOs on other reactor system parameters and equipment performance.

Technical Specifications are required by 10 CFR 50.36 to contain LSSS defined by the regulation as "...settings for automatic protective devices...so chosen that automatic protective action will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytic 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 Analytic Limit therefore ensures that the SL is not exceeded. However, in practice, the actual settings for automatic protective devices must be chosen to be more conservative than the Analytic Limit to account for instrument loop uncertainties related to the setting at which the automatic protective action would actually occur.

The trip setpoint is a predetermined setting for a protective device chosen to ensure automatic actuation prior to the process variable reaching the Analytic Limit and thus ensuring that the SL would not be exceeded. As such, the trip setpoint accounts for uncertainties in setting the device (e.g., calibration), uncertainties in how the device might actually perform (e.g., repeatability), changes in the point of action of the device 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 trip setpoint plays an important role in ensuring that SLs are not exceeded. As such, the trip setpoint meets the definition of an LSSS (Ref. 1) and could be used to meet the requirement that they be contained in the Technical Specifications.

Protection
P
for variables that have significant safety functions.
include
Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that
LSSS are
actions
protective
Analytical
safety
Analytical
protection channels
Analytical
INSERT 1
INSERT 2
2
7
[Nominal Trip Setpoint (NTSP)] specified in the SCP
protection channel
Analytical
[NTSP]
channel
[NTSP] ensures
Therefore
[NTSP]

2

INSERT 1

The LSSS values are identified and maintained in the Setpoint Control Program (SCP) controlled by 10 CFR 50.59. 5

2

INSERT 2

~~-- REVIEWER'S NOTE --~~
~~The term "Limiting Trip Setpoint (LTSP)" is generic terminology for the calculated field 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.~~

~~For most Westinghouse plants the term Nominal Trip Setpoint (NTSP) is in place of the term LTSP and NTSP will replace LTSP in the Bases descriptions. "Field setting" is the suggested terminology for the actual setpoint where margin has been added to the calculated field setting. The as-found and as-left tolerances will apply to the field setting implemented in the Surveillance procedures to confirm channel performance.~~

~~The [NTSP] and field setting are located in the SCP.~~ 7

~~--~~

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

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 functions(s)." For automatic protective devices, the required safety function is to ensure that a SL is not exceeded and therefore the LSSS as defined by 10 CFR 50.36 is the same as the OPERABILITY limit for these devices. However, use of the trip setpoint to define OPERABILITY in Technical Specifications and its corresponding designation as the LSSS required by 10 CFR 50.36 would be an overly restrictive requirement if it were applied as an OPERABILITY limit for the "as found" value of a protective device 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 protective device with a setting that has been found to be different from the trip setpoint due to some drift of the setting may still be OPERABLE since drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the trip setpoint and thus the automatic protective action would still have ensured that the SL would not be exceeded with the "as found" setting of the protective device. Therefore, the device would still be OPERABLE since it would have performed its safety function and the only corrective action required would be to reset the device to the trip setpoint to account for further drift during the next surveillance interval.

Relying solely on

NTSP

\-

protection channel

NTSP

protection channel

\-

channel

channel within

established as-left tolerance around the NTSP

2

Use of the trip setpoint to define "as found" OPERABILITY and its designation as the LSSS under the expected circumstances described above would result in actions required by both the rule and Technical Specifications that are clearly not warranted. However, there is also some point beyond which the device would have not been able to perform its function due, for example, to greater than expected drift. This value needs to be specified in the Technical Specifications in order to define OPERABILITY of the devices and is designated as the Allowable Value which, as stated above, is the same as the LSSS.

2

The Allowable Value specified in Table 3.3.1-1 serves as the LSSS such that a channel is OPERABLE if the trip setpoint is found not to exceed the Allowable Value during the CHANNEL OPERATIONAL TEST (COT). As such, the Allowable Value differs from the trip setpoint by an amount primarily equal to the expected instrument loop uncertainties, such as drift, during the surveillance interval. In this manner, the actual setting of the device will still meet the LSSS definition and ensure that a SL

2

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

is not exceeded at any given point of time as long as the device has not drifted beyond that expected during the surveillance interval. Note that, although the channel is "OPERABLE" under these circumstances, the trip setpoint should be left adjusted to a value within the established trip setpoint calibration tolerance 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. If the actual setting of the device is found to have exceeded the Allowable Value the device would be considered inoperable from a technical specification perspective. This requires corrective action including those actions required by 10 CFR 50.36 when automatic protective devices do not function as required. 2

[Note: Alternatively, a Technical Specification format incorporating an Allowable Value only column may be proposed by a licensee. In this case the trip setpoint value of Table 3.3.1-1 is located in the Technical Specification Bases or in a licensee-controlled document outside the Technical Specification. Changes to the trip setpoint value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements. At their option, the licensee may include the trip setpoint in Table 3.3.1-1 as shown, or as suggested by the licensees' setpoint methodology or license.] 2

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

1. The Departure from Nucleate Boiling Ratio (DNBR) shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling (DNB), ; 3

2. Fuel centerline melt shall not occur, and ; 3

3. The RCS pressure SL of 2750 psia shall not be exceeded.

Operation within the SLs of Specification 2.0, "Safety Limits (SLs)," also maintains the above values and assures that offsite dose will be within the 10 CFR 50 and 10 CFR ~~100~~ 50.67 criteria during AOOs.

Accidents are events that are analyzed even though they are not expected to occur during the unit life. The acceptable limit during accidents is that offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 limits. Different accident categories are allowed 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.

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

P

The RTS instrumentation is segmented into four distinct but interconnected modules as illustrated in Figure [ ], FSAR, Chapter [7] (Ref. 2), and as identified below: 7.2-2 U 4

1. Field transmitters or process sensors: provide a measurable electronic signal based upon the physical characteristics of the parameter being measured; 3

2. Signal Process Control and Protection System, including Analog Protection System, Nuclear Instrumentation System (NIS), field contacts, and protection channel sets: provides signal conditioning, bistable setpoint comparison, process algorithm actuation, compatible electrical signal output to protection system devices, and control board/control room/miscellaneous indications; 2 3

Protection Instrumentation Rack (PPIR) Reactor Channels and Channels channels bistable

3. Solid State Protection System (SSPS), including input, logic, and output bays: initiates proper unit shutdown and/or ESF actuation in accordance with the defined logic, which is based on the bistable outputs from the signal process control and protection system, and 3

Reactor Protection Logic Rack racks reactor protection logic rack;

4. Reactor trip switchgear, including reactor trip breakers (RTBs) and bypass breakers: provides the means to interrupt power to the control rod drive mechanisms (CRDMs) and allows the rod cluster control assemblies (RCCAs), or "rods," to fall into the core and shut down the reactor. The bypass breakers allow testing of the RTBs at power.

Field Transmitters or Sensors

To meet the design demands for redundancy and reliability, more than one, and often as many as four, field transmitters or sensors are used to measure unit parameters. To account for the calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in the trip setpoint and Allowable Values. The OPERABILITY of each transmitter or sensor is determined by either "as-found" calibration data evaluated during the CHANNEL CALIBRATION or by qualitative assessment of field transmitter or sensor as related to the channel behavior observed during performance of the CHANNEL CHECK. [NTSP] 2

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All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

Protection Instrumentation Rack (PPIR)

Signal Process Control and Protection System

NTSPs derived from Analytical Limits (ALs) 2

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. These setpoints are defined in FSAR, ~~Chapter [7] (Ref. 2), Chapter [6] (Ref. 3), and~~ Chapter [15] (Ref. 4). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the SSPS for decision evaluation. Channel separation is maintained up to and through the input bays. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the SSPS, while others provide input to the SSPS, the main control board, the unit computer, and one or more control systems.

ALs | the | U | 2 | 14 | reactor protection logic rack | reactor protection logic rack | reactor protection logic rack

Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If one channel fails in a direction that would not result in a partial Function trip, the Function is still OPERABLE with a two-out-of-two logic. If one channel fails, such that a partial Function trip occurs, a trip will not occur and the Function is still OPERABLE with a one-out-of-two logic.

reactor protection logic rack

Generally, if a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Again, a single failure will neither cause nor prevent the protection function actuation. These requirements are described in IEEE-279-1971 (Ref. 5). The actual number of channels required for each unit parameter is specified in Reference 2.

1968

At least

P

Two logic channels are required to ensure no single random failure of a logic channel will disable the RTS. The logic channels are designed such that testing required while the reactor is at power may be accomplished without causing trip. Provisions to allow removing logic channels from service during maintenance are unnecessary because of the logic system's designed reliability.

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

Nominal Trip

Allowable Values and RTS Setpoints

the Nominal Trip Setpoints

calculation

The 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, instrument drift, and severe environment errors for those RTS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 6), the Allowable Values specified in Table 3.3.1-1 in the accompanying LCO are conservative with respect to the analytical limits. A detailed description of the methodology used to calculate the Allowable Values and trip setpoints, including their explicit uncertainties, is provided in the "RTS/ESFAS Setpoint Methodology Study" (Ref. 7) which incorporates all of the known uncertainties applicable to each channel. The magnitudes of these uncertainties are factored into the determination of each trip setpoint and corresponding Allowable Value. The trip setpoint entered into the bistable is more conservative than that specified by the Allowable Value (LSSS) to account for measurement errors detectable by the COT. The Allowable Value serves as the Technical Specification OPERABILITY limit for the purpose of the COT. 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.

P

the SCP

[NTSP]

The as-left tolerance and as-found tolerance band methodology is provided in the SCP.

as-found

2

The trip setpoint is the value at which the bistable is set and is the expected value to be achieved during calibration. The trip setpoint value ensures the LSSS and the safety analysis limits are met for surveillance interval selected when a channel is adjusted based on stated channel uncertainties. Any bistable is considered to be properly adjusted when the "as left" setpoint value is within the band for CHANNEL CALIBRATION uncertainty allowance (i.e., ± rack calibration + comparator setting uncertainties). The trip setpoint value is therefore considered a "nominal" value (i.e., expressed as a value without inequalities) for the purposes of COT and CHANNEL CALIBRATION.

[NTSP]

[NTSP]

ensures

is

the

-

[NTSP]

as-left tolerance

and

[NTSP]

2

[Nominal

[]

, in conjunction with the use of as-found and as-left tolerances, together

Trip setpoints consistent with the requirements of the Allowable Value ensure that SLs are not violated during AOOs (and that the consequences of DBAs will be acceptable, providing the unit is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed).

2

Note that the Allowable Values listed in the SCP are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION, CHANNEL OPERATIONAL TEST, or a TRIP ACTUATING DEVICE OPERATIONAL TEST that requires trip setpoint verification.

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

Each channel of the process control equipment can be tested on line to verify that the signal or setpoint accuracy is within the specified allowance requirements of the SCP ~~Reference 3~~. Once a designated channel is taken out of service for testing, a simulated signal is injected in place of the field instrument signal. The process equipment for the channel in test is then tested, verified, and calibrated. SRs for the channels are specified in the SRs section. 2

Reactor Protection Instrument Rack (RPIR)

~~Solid State Protection System~~

The RPIR ~~SSPS~~ equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of RPIR ~~SSPS~~, each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide reactor trip and/or ESF actuation for the unit. If both trains are taken out of service ~~or placed in test~~, a reactor trip will result. An interlock on the reactor trip bypass breakers prevents both trains from being tested at the same time. Each train is packaged in its own cabinet for physical and electrical separation to satisfy separation and independence requirements. The system has been designed to trip in the event of a loss of power, directing the unit to a safe shutdown condition.

The RPIR ~~SSPS~~ performs the decision logic for actuating a reactor trip or ESF actuation, generates the electrical output signal that will initiate the required trip or actuation, and provides the status, permissive, and annunciator output signals to the main control room of the unit.

The bistable outputs from the signal processing equipment are sensed by the RPIR ~~SSPS~~ equipment and combined into logic matrices that represent combinations indicative of various unit upset and accident transients. If a required logic matrix combination is completed, the system will initiate a reactor trip or send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.

Reactor Trip Switchgear

The RTBs are in the electrical power supply line from the control rod drive motor generator set power supply to the CRDMs. Opening of the RTBs interrupts power to the CRDMs, which allows the shutdown rods and control rods to fall into the core by gravity. Each RTB is equipped with a bypass breaker to allow testing of the RTB while the unit is at power.

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

RPIR

During normal operation the output from the SSPS is a voltage signal that energizes the undervoltage coils in the RTBs and bypass breakers, if in use. When the required logic matrix combination is completed, the SSPS output voltage signal is removed, the undervoltage coils are de-energized, the breaker trip lever is actuated by the de-energized undervoltage coil, and the RTBs and bypass breakers are tripped open. This allows the shutdown rods and control rods to fall into the core. In addition to the de-energization of the undervoltage coils, each breaker is also equipped with a shunt trip device that is energized to trip the breaker open upon receipt of a reactor trip signal from the SSPS. Either the undervoltage coil or the shunt trip mechanism is sufficient by itself, thus providing a diverse trip mechanism.

RPIR RPIR

The decision logic matrix Functions are described in the functional diagrams included in Reference ~~3~~. In addition to the reactor trip or ESF, these diagrams also describe the various "permissive interlocks" that are associated with unit conditions. Each train has a built in testing ~~device~~ that can ~~automatically~~ test the decision logic matrix Functions and the actuation ~~devices~~ while the unit is at power. When any one train is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed. ~~The testing device is semiautomatic to minimize testing time.~~

2 panel channels 10 2

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

P

The RTS functions to maintain the SLs during all AOOs and mitigates the consequences of DBAs in all MODES in which the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

INSERT 3 2

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.

P P P P

Each of the analyzed accidents and transients can be detected by one or more RTS Functions. The accident analysis described in Reference 4 takes credit for most RTS trip Functions. RTS trip Functions not specifically credited in the accident analysis are ~~qualitatively~~ credited in the safety analysis and the NRC staff approved licensing basis for the unit. These RTS trip Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. They may also serve as backups to RTS trip Functions that were credited in the accident analysis.

implicitly
, except for the Turbine Trip Functions

P

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 ~~in the accompanying LCO~~, to be OPERABLE. ~~A channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its~~

2

2

INSERT 3

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.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the "as-left" calibration tolerance band of the Nominal Trip Setpoint. A trip setpoint may be set more conservative than the Nominal Trip Setpoint as necessary in response to plant conditions. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.~~ 2

INSERT 4 2

The LCO generally requires OPERABILITY of four or three channels in each instrumentation Function, two channels of Manual Reactor Trip in each logic Function, and two trains in each Automatic Trip Logic Function. Four OPERABLE instrumentation channels in a two-out-of-four configuration are required when one R~~T~~S P channel is also used as a control system input except for Steam Generator level and Pressurizer level which uses 3 channels. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires R~~T~~S P action. In this case, the R~~T~~S P will still provide protection, even with random failure of one of the other three protection channels. Three OPERABLE instrumentation channels in a two-out-of-three configuration are generally required when there is no potential for control system and protection system interaction that could simultaneously create a need for R~~T~~S P trip and disable one R~~T~~S P channel. The two-out-of-three and two-out-of-four configurations allow one channel to be tripped during maintenance or testing without causing a reactor trip. Specific exceptions to the above general philosophy exist and are discussed below.

Reactor ~~Trip~~ Protection System Functions

The safety analyses and OPERABILITY requirements applicable to each R~~T~~S P Function are discussed below:

1. Manual Reactor Trip

The Manual Reactor Trip ensures that the control room operator can initiate a reactor trip at any time by using either of two reactor trip switches in the control room. A Manual Reactor Trip accomplishes the same results as any one of the automatic trip Functions. It is used by the reactor operator to shut down the reactor whenever any parameter is rapidly trending toward its Trip Setpoint.

The LCO requires two Manual Reactor Trip channels to be OPERABLE. Each channel is controlled by a manual reactor trip switch. Each channel activates the reactor trip breaker in both trains. Two independent channels are required to be OPERABLE so that no single random failure will disable the Manual Reactor Trip Function.

2 **INSERT 4**

The Allowable Value specified in the SCP is the least conservative value of the as-found setpoint that the channel can have when tested, such that a channel is OPERABLE if the as-found setpoint is within the as-found tolerance and is conservative with respect to the Allowable Value during a CHANNEL CALIBRATION, or CHANNEL OPERATIONAL TEST (COT). As such, the Allowable Value differs from the [NTSP] by an amount [greater than or] equal to the expected instrument channel uncertainties, such as drift, during the surveillance interval. In this manner, the actual setting of the channel ([NTSP]) will ensure that a SL is not exceeded at any given point of time as long as the channel has not drifted beyond expected tolerances during the surveillance interval. In this manner, the actual setting of the channel (NTSP) will ensure that a SL is not exceeded at any given point of time as long as the channel has not drifted beyond expected tolerances during the surveillance intervals. Note that, 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). 4

If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the [NTSP] (within the allowed tolerance), and evaluating the channel's 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's as-found setting will be entered into the Corrective Action Program for further evaluation. 4

A trip setpoint may be set more conservative that the [NTSP] as necessary in response 4
to plant conditions. However, in this case, the operability of this instrument must be
verified based on the [field setting] and not the NTSP. Failure of any instrument renders 4
the affected channel(s) inoperable and reduces the reliability of the affected Functions. 4

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODE 1 or 2, manual initiation of a reactor trip must be OPERABLE. These are the MODES in which the shutdown rods and/or control rods are partially or fully withdrawn from the core. In MODE 3, 4, or 5, the manual initiation Function must also be OPERABLE if one or more shutdown rods or control rods are withdrawn or the Rod Control System is capable of withdrawing the shutdown rods or the control rods. In this condition, inadvertent control rod withdrawal is possible. In MODE 3, 4, or 5, manual initiation of a reactor trip does not have to be OPERABLE if the Rod Control System is not capable of withdrawing the shutdown rods or control rods and if all rods are fully inserted. If the rods cannot be withdrawn from the core, or all of the rods are inserted, there is no need to be able to trip the reactor. In MODE 6, neither the shutdown rods nor the control rods are permitted to be withdrawn and the CRDMs are disconnected from the control rods and shutdown rods. Therefore, the manual initiation Function is not required.

2. Power Range Neutron Flux

The NIS power range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS power range detectors provide input to the Rod Control System and the Steam Generator (SG) Water Level Control System. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Note that this Function also provides a signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor.

a. Power Range Neutron Flux - High

The Power Range Neutron Flux - High trip Function ensures that protection is provided, from all power levels, against a positive reactivity excursion leading to DNB during power operations. These can be caused by rod withdrawal or reductions in RCS temperature.

The LCO requires all four of the Power Range Neutron Flux - High channels to be OPERABLE.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODE 1 or 2, when a positive reactivity excursion could occur, the Power Range Neutron Flux - High trip must be OPERABLE. This Function will terminate the reactivity excursion and shut down the reactor prior to reaching a power level that could damage the fuel. In MODE 3, 4, 5, or 6, the NIS power range detectors cannot detect neutron levels in this range. In these MODES, the Power Range Neutron Flux - High does not have to be OPERABLE because the reactor is shut down and reactivity excursions into the power range are extremely unlikely. P Other RTS Functions and administrative controls provide protection against reactivity additions when in MODE 3, 4, 5, or 6.

b. Power Range Neutron Flux - Low

The LCO requirement for the Power Range Neutron Flux - Low trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.

The LCO requires all four of the Power Range Neutron Flux - Low channels to be OPERABLE.

In MODE 1, below the Power Range Neutron Flux (P-10 setpoint), and in MODE 2, the Power Range Neutron Flux - Low trip must be OPERABLE. This Function may be manually blocked by the operator when two out of four power range channels are greater than approximately 10% RTP (P-10 setpoint). This Function is automatically unblocked when three out of four power range channels are below the P-10 setpoint. Above the P-10 setpoint, positive reactivity additions are mitigated by the Power Range Neutron Flux - High trip Function.

In MODE 3, 4, 5, or 6, the Power Range Neutron Flux - Low trip Function does not have to be OPERABLE because the reactor is shut down and the NIS power range detectors cannot detect neutron levels in this range. Other RTS trip Functions and P administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

3. Power Range Neutron Flux Rate

The Power Range Neutron Flux Rate trips use the same channels as discussed for Function 2 above.

a. Power Range Neutron Flux - High Positive Rate

The Power Range Neutron Flux - High Positive Rate trip Function ensures that protection is provided against rapid increases in neutron flux that are characteristic of an RCCA drive rod housing rupture and the accompanying ejection of the RCCA. This Function compliments the Power Range Neutron Flux - High and Low Setpoint trip Functions to ensure that the criteria are met for a rod ejection from the power range.

The LCO requires all four of the Power Range Neutron Flux - High Positive Rate channels to be OPERABLE.

In MODE 1 or 2, when there is a potential to add a large amount of positive reactivity from a rod ejection accident (REA), the Power Range Neutron Flux - High Positive Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux - High Positive Rate trip Function does not have to be OPERABLE because other RTS trip Functions and administrative controls will provide protection against positive reactivity additions. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the SDM is increased during refueling operations. The reactor vessel head is also removed or the closure bolts are detensioned preventing any pressure buildup. In addition, the NIS power range detectors cannot detect neutron levels present in this mode.

P

b. Power Range Neutron Flux - High Negative Rate

The Power Range Neutron Flux - High Negative Rate trip Function ensures that protection is provided for multiple rod drop accidents. At high power levels, a multiple rod drop accident could cause local flux peaking that would result in an unconservative local DNBR. DNBR is defined as the ratio of the

nonconservative

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

heat flux required to cause a DNB at a particular location in the core to the local heat flux. The DNBR is indicative of the margin to DNB. No credit is taken for the operation of this Function for those rod drop accidents in which the local DNBRs will be greater than the limit.

The Power Range Neutron Flux – High Negative Rate is not credited in current safety analysis.

The LCO requires all four Power Range Neutron Flux - High Negative Rate channels to be OPERABLE.

In MODE 1 or 2, when there is potential for a multiple rod drop accident to occur, the Power Range Neutron Flux - High Negative Rate trip must be OPERABLE. In MODE 3, 4, 5, or 6, the Power Range Neutron Flux - High Negative Rate trip Function does not have to be OPERABLE because the core is not critical and DNB is not a concern. Also, since only the shutdown banks may be withdrawn in MODE 3, 4, or 5, the remaining complement of control bank worth ensures a sufficient degree of SDM in the event of an REA. In MODE 6, no rods are withdrawn and the required SDM is increased during refueling operations. In addition, the NIS power range detectors cannot detect neutron levels present in this MODE.

4. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux - Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range detectors do not provide any input to control systems. Note that this Function also provides a signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Because this trip Function is important only during startup, there is generally no need to disable channels for testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2 above the P-6 setpoint, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux - High Setpoint trip and the Power Range Neutron Flux - High Positive Rate trip provide core protection for a rod withdrawal accident. In MODE 2 below the P-6 setpoint, the Source Range Neutron Flux Trip provides the core protection for reactivity accidents. In MODE 3, 4, or 5, the Intermediate Range Neutron Flux trip does not have to be OPERABLE because the control rods must be fully inserted and only the shutdown rods may be withdrawn. The reactor cannot be started up in this condition. The core also has the required SDM to mitigate the consequences of a positive reactivity addition accident. In MODE 6, all rods are fully inserted and the core has a required increased SDM. Also, the NIS intermediate range detectors cannot detect neutron levels present in this MODE.

5. <u>Source Range Neutron Flux</u>

The LCO requirement for the Source Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux - Low trip Function. In MODES 3, 4, and 5, administrative controls also prevent the uncontrolled withdrawal of rods. The NIS source range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS source range detectors do not provide any inputs to control systems. The source range trip is the only RTS automatic protection function required in MODES 3, 4, and 5 when rods are capable of withdrawal or one or more rods are not fully inserted. Therefore, the functional capability at the specified Trip Setpoint is assumed to be available. P

The Source Range Neutron Flux Function provides protection for control rod withdrawal from subcritical, boron dilution and control rod ejection events.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODE 2 when below the P-6 setpoint and in MODES 3, 4, and 5 when there is a potential for an uncontrolled RCCA bank rod withdrawal accident, the Source Range Neutron Flux trip must be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. Above the P-6 setpoint, the Intermediate Range Neutron Flux trip and the Power Range Neutron Flux - Low trip will provide core protection for reactivity accidents. Above the P-6 setpoint, the NIS source range detectors are de-energized.

In MODES 3, 4, and 5 with all rods fully inserted and the Rod Control System not capable of rod withdrawal, and in MODE 6, the outputs of the Function to RTS logic are not required OPERABLE. The requirements for the NIS source range detectors to monitor core neutron levels and provide indication of reactivity changes that may occur as a result of events like a boron dilution are addressed in LCO 3.3.9 "Boron Dilution Protection System (BDPS)," for MODE 3, 4, or 5 and LCO 3.9.3, "Nuclear Instrumentation," for MODE 6. 5
P 2

6. Overtemperature ΔT

The Overtemperature ΔT trip Function is provided to ensure that the design limit DNBR is met. This trip Function also limits the range over which the Overpower ΔT trip Function must provide protection. The inputs to the Overtemperature ΔT trip include all pressure, coolant temperature, axial power distribution, and reactor power as indicated by loop ΔT assuming full reactor coolant flow. Protection from violating the DNBR limit is assured for those transients that are slow with respect to delays from the core to the measurement system. The Function monitors both variation in power and flow since a decrease in flow has the same effect on ΔT as a power increase. The Overtemperature ΔT trip Function uses each loop's ΔT as a measure of reactor power and is compared with a setpoint that is automatically varied with the following parameters:

- reactor coolant average temperature - the Trip Setpoint is varied to correct for changes in coolant density and specific heat capacity with changes in coolant temperature. ; 3

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- pressurizer pressure - the Trip Setpoint is varied to correct for changes in system pressure, and ; 3
- axial power distribution - f(ΔI), the Trip Setpoint is varied to account for imbalances in the axial power distribution as detected by the NIS upper and lower power range detectors. If axial peaks are greater than the design limit, as indicated by the difference between the upper and lower NIS power range detectors, the Trip Setpoint is reduced in accordance with ~~Note 1 of Table 3.3.1-1~~ the SCP. 2

Dynamic compensation is included for system piping delays from the core to the temperature measurement system.

The Overtemperature ΔT trip Function is calculated for each loop as described in ~~Note 1 of Table 3.3.1-1~~ the SCP. Trip occurs if Overtemperature ΔT is indicated in two loops. ~~At some units,~~ the pressure and temperature signals are used for other control functions. ~~For those units,~~ the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Note that this Function also provides a signal to generate a turbine runback prior to reaching the Trip Setpoint. A turbine runback will reduce turbine power and reactor power. A reduction in power will normally alleviate the Overtemperature ΔT condition and may prevent a reactor trip. 2

The LCO requires all four channels of the Overtemperature ΔT trip Function to be OPERABLE ~~for two and four loop units (the LCO requires all three channels on the Overtemperature ΔT trip Function to be OPERABLE for three loop units)~~. Note that the Overtemperature ΔT Function receives input from channels shared with other RPS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. 5

In MODE 1 or 2, the Overtemperature ΔT trip must be OPERABLE to prevent DNB. In MODE 3, 4, 5, or 6, this trip Function does not have to be OPERABLE because the reactor is not operating and there is insufficient heat production to be concerned about DNB.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

7. Overpower ΔT

The Overpower ΔT trip Function ensures that protection is provided to ensure the integrity of the fuel (i.e., no fuel pellet melting and less than 1% cladding strain) under all possible overpower conditions. This trip Function also limits the required range of the Overtemperature ΔT trip Function and provides a backup to the Power Range Neutron Flux - High Setpoint trip. The Overpower ΔT trip Function ensures that the allowable heat generation rate (kW/ft) of the fuel is not exceeded. It uses the ΔT of each loop as a measure of reactor power with a setpoint that is automatically varied with the following parameters:

- reactor coolant average temperature - the Trip Setpoint is varied to correct for changes in coolant density and specific heat capacity with changes in coolant temperature~~,~~ ; and 3
- rate of change of reactor coolant average temperature - including dynamic compensation for the delays between the core and the temperature measurement system.

The Overpower ΔT trip Function is calculated for each loop as per ~~Note 2 of Table 3.3.1-1~~ the SCP. Trip occurs if Overpower ΔT is indicated in two loops. ~~At some units,~~ the temperature signals are used for other control functions. ~~At those units,~~ the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation and a single failure in the remaining channels providing the protection function actuation. Note that this Function also provides a signal to generate a turbine runback prior to reaching the Allowable Value. A turbine runback will reduce turbine power and reactor power. A reduction in power will normally alleviate the Overpower ΔT condition and may prevent a reactor trip. 2

The LCO requires four channels ~~for two and four loop units (three channels for three loop units)~~ of the Overpower ΔT trip Function to be OPERABLE. Note that the Overpower ΔT trip Function receives input from channels shared with other R~~T~~S Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. 5 P

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All changes are 1 unless otherwise noted

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODE 1 or 2, the Overpower ΔT trip Function must be OPERABLE. These are the only times that enough heat is generated in the fuel to be concerned about the heat generation rates and overheating of the fuel. In MODE 3, 4, 5, or 6, this trip Function does not have to be OPERABLE because the reactor is not operating and there is insufficient heat production to be concerned about fuel overheating and fuel damage.

8. Pressurizer Pressure

The same sensors provide input to the Pressurizer Pressure - High and - Low trips and the Overtemperature ΔT trip. ~~At some units,~~ ~~t~~the Pressurizer Pressure channels are also used to provide input to the Pressurizer Pressure Control System. ~~For those units,~~ ~~t~~the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation.

a. Pressurizer Pressure - Low

The Pressurizer Pressure - Low trip Function ensures that protection is provided against violating the DNBR limit due to low pressure.

The LCO requires four channels for ~~two and four loop units (three channels for three loop units)~~ of Pressurizer Pressure - Low to be OPERABLE. 5

In MODE 1, when DNB is a major concern, the Pressurizer Pressure - Low trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-7 interlock (NIS power range P-10 or turbine impulse pressure greater than approximately 10% of full power equivalent (P-13)). On decreasing power, this trip Function is automatically blocked below P-7. Below the P-7 setpoint, no conceivable power distributions can occur that would cause DNB concerns.

b. Pressurizer Pressure - High

The Pressurizer Pressure - High trip Function ensures that protection is provided against overpressurizing the RCS. This trip Function operates in conjunction with the pressurizer relief and safety valves to prevent RCS overpressure conditions.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The LCO requires ~~four~~ three channels ~~for two and four loop units (three channels for three loop units)~~ of the Pressurizer Pressure - High to be OPERABLE. 5

~~The Pressurizer Pressure - High LSSS is selected to be below the pressurizer safety valve actuation pressure and above the power operated relief valve (PORV) setting. This setting minimizes challenges to safety valves while avoiding unnecessary reactor trip for those pressure increases that can be controlled by the PORVs.~~

In MODE 1 or 2, the Pressurizer Pressure - High trip must be OPERABLE to help prevent RCS overpressurization and minimize challenges to the relief and safety valves. In MODE 3, 4, 5, or 6, the Pressurizer Pressure - High trip Function does not have to be OPERABLE because transients that could cause an overpressure condition will be slow to occur. Therefore, the operator will have sufficient time to evaluate unit conditions and take corrective actions. Additionally, low temperature overpressure protection systems provide overpressure protection when below MODE 4.

9. Pressurizer Water Level - High

The Pressurizer Water Level - High trip Function provides a backup signal for the Pressurizer Pressure - High trip and also provides protection against water relief through the pressurizer safety valves. These valves are designed to pass steam in order to achieve their design energy removal rate. A reactor trip is actuated prior to the pressurizer becoming water solid. The LCO requires three channels of Pressurizer Water Level - High to be OPERABLE. The pressurizer level channels are used as input to the Pressurizer Level Control System. A fourth channel is not required to address control/protection interaction concerns. The level channels do not actuate the safety valves, and the high pressure reactor trip is set below the safety valve setting. Therefore, with the slow rate of charging available, pressure overshoot due to level channel failure cannot cause the safety valve to lift before reactor high pressure trip.

In MODE 1, when there is a potential for overfilling the pressurizer, the Pressurizer Water Level - High trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-7

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

interlock. On decreasing power, this trip Function is automatically blocked below P-7. Below the P-7 setpoint, transients that could raise the pressurizer water level will be slow and the operator will have sufficient time to evaluate unit conditions and take corrective actions.

10. Reactor Coolant Flow - Low

The Reactor Coolant Flow - Low trip Function ensures that protection is provided against violating the DNBR limit due to low flow in one or more RCS loops, while avoiding reactor trips due to normal variations in loop flow. Above the P-7 setpoint, the reactor trip on low flow in two ~~or more~~ RCS loops is automatically enabled. Above the P-8 setpoint, which is approximately 10 ~~48~~% RTP, a loss of flow in any RCS loop will actuate a reactor trip. Each RCS loop has three flow detectors to monitor flow. The flow signals are not used for any control system input.

The LCO requires three Reactor Coolant Flow - Low channels per loop to be OPERABLE in MODE 1 above P-~~7~~ 8. 5

In MODE 1 above the P-8 setpoint, a loss of flow in one or both RCS loop s could result in DNB conditions in the core because of the higher power level. ~~In MODE 1 below the P-8 setpoint and above the P-7 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip because of the lower power level and the greater margin to the design limit DNBR.~~ Below the P-~~7~~ 8 setpoint, all reactor trips on low flow are automatically blocked since there is insufficient heat production to generate DNB conditions.

11. Reactor Coolant Pump (RCP) Breaker Position

Both RCP Breaker Position trip Functions operate together on two sets of auxiliary contacts, with one set on each RCP breaker. These Functions anticipate the Reactor Coolant Flow - Low trips to avoid RCS heatup that would occur before the low flow trip actuates.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Reactor Coolant Pump Breaker Position (Single Loop)

The RCP Breaker Position (Single Loop) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in one RCS loop. The position of each RCP breaker is monitored. If one RCP breaker is open above the P-8 setpoint, a reactor trip is initiated. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low (Single Loop) Trip Setpoint is reached.

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this trip Function because the RCS Flow - Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of a pump.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-8 setpoint, when a loss of flow in any RCS loop could result in DNB conditions in the core, the RCP Breaker Position (Single Loop) trip must be OPERABLE. In MODE 1 below the P-8 setpoint, ~~a~~ all reactor trips on loss of flow in two ~~or more~~ loops are automatically blocked ~~is required to actuate a reactor trip~~ because of the lower power level and the greater margin to the design limit DNBR.

b. Reactor Coolant Pump Breaker Position (Two Loops)

The RCP Breaker Position (Two Loops) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two ~~or more~~ RCS loops. The position of each RCP breaker is monitored. Above the P-7 setpoint ~~and below the P-8 setpoint~~, a loss of flow in two ~~or more~~ loops will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low (Two Loops) Trip Setpoint is reached.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this Function because the RCS Flow - Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of an RCP.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-7 setpoint ~~and below the P-8 setpoint~~, the RCP Breaker Position (Two Loops) trip must be OPERABLE. 5

In MODE 1 above the P-8 setpoint, the RCP Breaker Position (Single Loop) trip must be OPERABLE.

Below the P-~~7~~ 8 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. 5 ~~Above the P-7 setpoint, the reactor trip on loss of flow in two RCS loops is automatically enabled. Above the P-8 setpoint, a loss of flow in any one loop will actuate a reactor trip because of the higher power level and the reduced margin to the design limit DNBR.~~ 5

12. Undervoltage Reactor Coolant Pumps

The Undervoltage RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two ~~or more~~ RCS loops. The voltage to each RCP is monitored. Above the P-7 setpoint, a loss of voltage detected on two ~~or more~~ RCP buses will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low (Two Loops) Trip Setpoint is reached. Time delays are incorporated into the Undervoltage RCPs channels to prevent reactor trips due to momentary electrical power transients.

INSERT 4A

The LCO requires ~~three~~ two Undervoltage RCPs channels ~~(one per phase)~~ per bus to be OPERABLE. 5

In MODE 1 above the P-7 setpoint, the Undervoltage RCP trip must be OPERABLE. In MODE 1 above the P-8 setpoint, Reactor Coolant Flow – Low and RCP Breaker Position Functions provide the necessary reactor trip on a loss of flow. Below the P-~~7~~ 8 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low 5

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1 **INSERT 4A**

The RCP buses have four undervoltage relays for each bus, two train A and two train B. All four undervoltage relays are used for tripping the reactor. For tripping the RCPs, only two per bus are used, train specific. For tripping of the reactor the four relays are divided into two channels per bus, one channel is associated with Train A reactor trip while the other is associated with Train B. Thus, each bus has a channel feeding each train of reactor trip. To receive a reactor trip, one channel from each RCP bus (1-1 and 1-2) must indicate an undervoltage condition. Thus to receive a reactor trip, an undervoltage condition must be indicated by at least one of two undervoltage relays on two of two RCP buses.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

power level. Above the P-7 setpoint, the reactor trip on loss of flow in two or more RCS loops is automatically enabled. This Function uses the same relays as the ESFAS Function 6.f, "Undervoltage Reactor Coolant Pump (RCP)" start of the auxiliary feedwater (AFW) pumps.

13. Underfrequency Reactor Coolant Pumps

The Underfrequency RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops from a major network frequency disturbance. An underfrequency condition will slow down the pumps, thereby reducing their coastdown time following a pump trip. The proper coastdown time is required so that reactor heat can be removed immediately after reactor trip. The frequency of each RCP bus is monitored. Above the P-7 setpoint, a loss of frequency detected on two or more RCP buses will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low (Two Loops) Trip Setpoint is reached. Time delays are incorporated into the Underfrequency RCPs channels to prevent reactor trips due to momentary electrical power transients.

two

The LCO requires ~~three~~ Underfrequency RCPs channels per bus to be OPERABLE. 5

In MODE 1 above the P-8 setpoint, Reactor Coolant Flow – Low and RCP Breaker Position Functions provide the necessary reactor trip on a loss of flow.

In MODE 1 above the P-7 setpoint, the Underfrequency RCPs trip must be OPERABLE. Below the P-~~7~~ setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. ~~Above the P-7 setpoint, the reactor trip on loss of flow in two or more RCS loops is automatically enabled.~~ 8 5 5

14. Steam Generator Water Level - Low Low

The SG Water Level - Low Low trip Function ensures that protection is provided against a loss of heat sink and actuates the AFW System prior to uncovering the SG tubes. The SGs are the heat sink for the reactor. In order to act as a heat sink, the SGs must contain a minimum amount of water. A narrow range low low level in any SG is indicative of a loss of heat sink for the reactor. The level transmitters provide input to the SG Level Control System. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. ~~This Function also performs the ESFAS function of starting the AFW pumps on low low SG level.~~

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The LCO requires four channels of SG Water Level - Low Low per SG to be OPERABLE for four loop units in which these channels are shared between protection and control. In two, three, and four loop units where three SG Water Levels are dedicated to the RTS, only three channels per SG are required to be OPERABLE.

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level - Low Low trip must be OPERABLE. The normal source of water for the SGs is the Main Feedwater (MFW) System (not safety related). The MFW System is only in operation in MODE 1 or 2. The AFW System is the safety related backup source of water to ensure that the SGs remain the heat sink for the reactor. During normal startups and shutdowns, the AFW System provides feedwater to maintain SG level. In MODE 3, 4, 5, or 6, the SG Water Level - Low Low Function does not have to be OPERABLE because the MFW System is not in operation and the reactor is not operating or even critical. Decay heat removal is accomplished by the AFW System in MODE 3 and by the Residual Heat Removal (RHR) System in MODE 4, 5, or 6.

15. Steam Generator Water Level - Low, Coincident With Steam Flow/Feedwater Flow Mismatch

SG Water Level - Low, in conjunction with the Steam Flow/Feedwater Flow Mismatch, ensures that protection is provided against a loss of heat sink and actuates the AFW System prior to uncovering the SG tubes. In addition to a decreasing water level in the SG, the difference between feedwater flow and steam flow is evaluated to determine if feedwater flow is significantly less than steam flow. With less feedwater flow than steam flow, SG level will decrease at a rate dependent upon the magnitude of the difference in flow rates. There are two SG level channels and two Steam Flow/Feedwater Flow Mismatch channels per SG. One narrow range level channel sensing a low level coincident with one Steam Flow/Feedwater Flow Mismatch channel sensing flow mismatch (steam flow greater than feed flow) will actuate a reactor trip.

The LCO requires two channels of SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch trip must be OPERABLE. The normal source of water for the SGs is the MFW System (not safety related). The MFW System is only in operation in MODE 1 or 2. The AFW System is the safety related backup source of water to ensure that the SGs remain the heat sink for the reactor. During normal startups and shutdowns, the AFW System provides feedwater to maintain SG level. In MODE 3, 4, 5, or 6, the SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch Function does not have to be OPERABLE because the MFW System is not in operation and the reactor is not operating or even critical. Decay heat removal is accomplished by the AFW System in MODE 3 and by the RHR System in MODE 4, 5, or 6. The MFW System is in operation only in MODE 1 or 2 and, therefore, this trip Function need only be OPERABLE in these MODES.

Move to after Function 19 on page B 3.3.1-33

20 16. Turbine Trip

a. Turbine Trip - Low Fluid Oil Pressure

The Turbine Trip - Low Fluid Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-9 setpoint, 7 10 approximately 50% power, will not actuate a reactor trip. Three pressure switches monitor the control oil pressure in the Turbine Electrohydraulic Control System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip. These pressure switches do not provide any input to the control system. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure - High trip Function and RCS integrity is ensured by the pressurizer safety valves.

The LCO requires three channels of Turbine Trip - Low Fluid Oil Pressure to be OPERABLE in MODE 1 above P-9. 7

7 Below the P-9 setpoint, a turbine trip does not actuate a reactor trip. In MODE 2, 3, 4, 5, or 6, there is no potential for a turbine trip, and the Turbine Trip - Low Fluid Oil Pressure trip Function does not need to be OPERABLE.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Move to after Function 19 on page B 3.3.1-33

b. Turbine Trip - Turbine Stop Valve Closure

The Turbine Trip - Turbine Stop Valve Closure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip from a power level below the P-~~9~~ 7 setpoint, approximately 10 ~~50~~% power. This action will not actuate a reactor trip. The trip Function anticipates the loss of secondary heat removal capability that occurs when the stop valves close. Tripping the reactor in anticipation of loss of secondary heat removal acts to minimize the pressure and temperature transient on the reactor. This trip Function will not and is not required to operate in the presence of a single channel failure. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure - High trip Function, and RCS integrity is ensured by the pressurizer safety valves. This trip Function is diverse to the Turbine Trip - Low Fluid Oil Pressure trip Function. Each turbine stop valve is equipped with one limit switch that inputs to the RTS. If ~~all four~~ both limit switches indicate that the stop valves are all closed, a reactor trip is initiated.

~~The LSSS for this Function is set to assure channel trip occurs when the associated stop valve is completely closed.~~

The LCO requires ~~four~~ two Turbine Trip - Turbine Stop Valve Closure channels, one per valve, to be OPERABLE in MODE 1 above P-~~9~~ 7. ~~All four~~ Both channels must trip to cause reactor trip.

Below the P-~~9~~ 7 setpoint, a load rejection can be accommodated by the Steam Dump System. In MODE 2, 3, 4, 5, or 6, there is no potential for a load rejection, and the Turbine Trip - Stop Valve Closure trip Function does not need to be OPERABLE.

5

~~17. Safety Injection Input from Engineered Safety Feature Actuation System~~

~~The SI Input from ESFAS ensures that if a reactor trip has not already been generated by the RTS, the ESFAS automatic actuation logic will initiate a reactor trip upon any signal that initiates SI. This is a condition of acceptability for the LOCA. However, other transients~~

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~and accidents take credit for varying levels of ESF performance and rely upon rod insertion, except for the most reactive rod that is assumed to be fully withdrawn, to ensure reactor shutdown. Therefore, a reactor trip is initiated every time an SI signal is present.~~

~~Trip Setpoint and Allowable Values are not applicable to this Function. The SI Input is provided by relay in the ESFAS. Therefore, there is no measurement signal with which to associate an LSSS.~~ 5

~~The LCO requires two trains of SI Input from ESFAS to be OPERABLE in MODE 1 or 2.~~

~~A reactor trip is initiated every time an SI signal is present. Therefore, this trip Function must be OPERABLE in MODE 1 or 2, when the reactor is critical, and must be shut down in the event of an accident. In MODE 3, 4, 5, or 6, the reactor is not critical, and this trip Function does not need to be OPERABLE.~~

16 ~~18~~. Reactor Trip System Interlocks 5

Reactor protection interlocks are provided to ensure reactor trips are in the correct configuration for the current unit status. They back up operator actions to ensure protection system Functions are not bypassed during unit conditions under which the safety analysis assumes the Functions are not bypassed. Therefore, the interlock Functions do not need to be OPERABLE when the associated reactor trip functions are outside the applicable MODES. These are:

a. Intermediate Range Neutron Flux, P-6

The Intermediate Range Neutron Flux, P-6 interlock is actuated when any NIS intermediate range channel goes approximately one decade above the minimum channel reading. If both channels drop below the setpoint, the permissive will automatically be defeated. The LCO requirement for the P-6 interlock ensures that the following Functions are performed:

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- on increasing power, the P-6 interlock allows the manual block of the NIS Source Range, Neutron Flux reactor trip. This prevents a premature block of the source range trip and allows the operator to ensure that the intermediate range is OPERABLE prior to leaving the source range. When the source range trip is blocked, the high voltage to the detectors is also removed~~.~~ ; and

3

- ~~on decreasing power, the P-6 interlock automatically energizes the NIS source range detectors and enables the NIS Source Range Neutron Flux reactor trip, and~~

- on increasing power, the P-6 interlock provides a backup block signal to the source range flux doubling circuit. Normally, this Function is manually blocked by the control room operator during the reactor startup.

The LCO requires two channels of Intermediate Range Neutron Flux, P-6 interlock to be OPERABLE in MODE 2 when below the P-6 interlock setpoint.

Above the P-6 interlock setpoint, the NIS Source Range Neutron Flux reactor trip will be blocked, and this Function will no longer be necessary.

In MODE 3, 4, 5, or 6, the P-6 interlock does not have to be OPERABLE because the NIS Source Range is providing core protection.

b. Low Power Reactor Trips Block, P-7

The Low Power Reactor Trips Block, P-7 interlock is actuated by input s from ~~either~~ the Power Range Neutron Flux~~, P-10, or the~~ and Turbine Impulse Pressure~~, P-13 interlock~~. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

(1) on increasing power, the P-7 interlock automatically enables reactor trips on the following Functions:

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- Pressurizer Pressure - Low ; 3
- Pressurizer Water Level - High ; 3
- Reactor Coolant Flow - Low (low flow in two ~~or more~~ RCS loops) ; 3
- RCPs Breaker Open (Two Loops) ; 3
- 3
- Undervoltage RCPs~~, and~~ ;
- Underfrequency RCPs ;

Turbine Trip – Low Fluid Oil Pressure; and
Turbine Trip – Turbine Stop Valve Closure.

These reactor trips are only required when operating above the P-7 setpoint (approximately 10% power). The reactor trips provide protection against violating the DNBR limit or, in the case of the Turbine Trip Functions, provide a backup reactor trip during a loss of load event. Below the P-7 setpoint, the RCS is capable of providing sufficient natural circulation without any RCP running.

(2) on decreasing power, the P-7 interlock automatically blocks reactor trips on the following Functions:

- Pressurizer Pressure - Low ; 3
- Pressurizer Water Level - High ; 3
- Reactor Coolant Flow - Low (low flow in two ~~or more~~ RCS loops) ; 3
- RCP Breaker Position (Two Loops) ; 3
- Undervoltage RCPs~~, and~~ ; 3
- Underfrequency RCPs ;

Turbine Trip – Low Fluid Oil Pressure; and
Turbine Trip – Turbine Stop Valve Closure.

Trip Setpoint and Allowable Value are not applicable to the P-7 interlock because it is a logic Function and thus has no parameter with which to associate an LSSS.

The P-7 interlock is a logic Function with train and not channel identity. Therefore, the LCO requires one channel per train of Low Power Reactor Trips Block, P-7 interlock to be OPERABLE in MODE 1.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The low power trips are blocked below the P-7 setpoint and unblocked above the P-7 setpoint. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the interlock performs its Function when power level drops below 10% power, which is in MODE 1.

c. Power Range Neutron Flux, P-8

The Power Range Neutron Flux, P-8 interlock is actuated at 10 approximately ~~48~~% power as determined by two-out-of-four NIS power range detectors. The P-8 interlock automatically enables the Reactor Coolant Flow - Low and RCP Breaker Position (Single Loop) reactor trips on low flow in one or ~~more~~ both RCS loops on increasing power. The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in the core when 10 greater than approximately ~~48~~% power. On decreasing power, the reactor trip on low flow in any loop is automatically blocked.

The LCO requires four channels of Power Range Neutron Flux, P-8 interlock to be OPERABLE in MODE 1.

In MODE 1, a loss of flow in one RCS loop could result in DNB conditions, so the Power Range Neutron Flux, P-8 interlock must be OPERABLE. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the core is not producing sufficient power to be concerned about DNB conditions.

d. Power Range Neutron Flux, P-9

The Power Range Neutron Flux, P-9 interlock is actuated at approximately 50% power as determined by two-out-of-four NIS power range detectors. The LCO requirement for this Function ensures that the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure reactor trips are enabled above the P-9 setpoint. Above the P-9 setpoint, a turbine trip will cause a load rejection beyond the capacity of the Steam Dump System. A reactor trip is automatically initiated on a turbine trip when it is above the P-9 setpoint, to minimize the transient on the reactor. 5

The LCO requires four channels of Power Range Neutron Flux, P-9 interlock to be OPERABLE in MODE 1.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~In MODE 1, a turbine trip could cause a load rejection beyond the capacity of the Steam Dump System, so the Power Range Neutron Flux interlock must be OPERABLE. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the reactor is not at a power level sufficient to have a load rejection beyond the capacity of the Steam Dump System.~~ 5

d ~~e~~. Power Range Neutron Flux, P-10 5

The Power Range Neutron Flux, P-10 interlock is actuated at approximately 10% power, as determined by two-out-of-four NIS power range detectors. If power level falls below 10% RTP on 3 of 4 channels, the nuclear instrument trips will be automatically unblocked. The LCO requirement for the P-10 interlock ensures that the following Functions are performed:

- on increasing power, the P-10 interlock allows the operator to manually block the Intermediate Range Neutron Flux reactor trip. Note that blocking the reactor trip also blocks the signal to prevent automatic and manual rod withdrawal~~.~~ ; 3
- on increasing power, the P-10 interlock allows the operator to manually block the Power Range Neutron Flux - Low reactor trip~~.~~ ; 3
- on increasing power, the P-10 interlock automatically provides a backup signal to block the Source Range Neutron Flux reactor trip~~, and also to de-energize the NIS source range detectors,~~ ; 3
- the P-10 interlock provides one of the two inputs to the P-7 interlock~~,~~ ; and 3
- on decreasing power, the P-10 interlock automatically enables the Power Range Neutron Flux - Low reactor trip and the Intermediate Range Neutron Flux reactor trip (and rod stop).

The LCO requires four channels of Power Range Neutron Flux, P-10 interlock to be OPERABLE in MODE 1 or 2.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

OPERABILITY in MODE 1 ensures the Function is available to perform its decreasing power Functions in the event of a reactor shutdown. This Function must be OPERABLE in MODE 2 to ensure that core protection is provided during a startup or shutdown by the Power Range Neutron Flux - Low and Intermediate Range Neutron Flux reactor trips. In MODE 3, 4, 5, or 6, this Function does not have to be OPERABLE because the reactor is not at power and the Source Range Neutron Flux reactor trip provides core protection.

e ~~f~~. <u>Turbine Impulse Pressure, P-13</u> 5

The Turbine Impulse Pressure, P-13 interlock is actuated when the pressure in the first stage of the high pressure turbine is greater than approximately 10% of the rated full power pressure. This is determined by one-out-of-two pressure detectors. The LCO requirement for this Function ensures that one of the inputs to the P-7 interlock is available.

The LCO requires two channels of Turbine Impulse Pressure, P-13 interlock to be OPERABLE in MODE 1.

The Turbine Impulse Chamber Pressure, P-13 interlock must be OPERABLE when the turbine generator is operating. The interlock Function is not required OPERABLE in MODE 2, 3, 4, 5, or 6 because the turbine generator is not operating.

17 ~~19~~. <u>Reactor Trip Breakers</u> 5

This trip Function applies to the RTBs exclusive of individual trip mechanisms. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of all trip breakers associated with a single R~~T~~PS logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Thus, the train may consist of the main breaker, bypass breaker, or main breaker and bypass breaker, depending upon the system configuration. Two OPERABLE trains ensure no single random failure can disable the R~~T~~PS trip capability.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these R~~T~~PS trip Functions must be OPERABLE when the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

18 20. Reproduced Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms 5

The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each RTB that is in service. The trip mechanisms are not required to be OPERABLE for trip breakers that are open, racked out, incapable of supplying power to the Rod Control System, or declared inoperable under Function 19 17 above. 5 OPERABILITY of both trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these RTS P trip Functions must be OPERABLE when the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

19 21. Automatic Trip Logic 6 5

The LCO requirement for the RTBs (Functions 19 17 and 20 18) and Automatic Trip Logic (Function 21 19) ensures that means are provided to interrupt the power to allow the rods to fall into the reactor core. 5 Each RTB is equipped with an undervoltage coil and a shunt trip coil to trip the breaker open when needed. Each RTB is equipped with a bypass breaker to allow testing of the trip breaker while the unit is at power. The reactor trip signals generated by the RTS P Automatic Trip Logic cause the RTBs and associated bypass breakers to open and shut down the reactor.

The LCO requires two trains of RTS P Automatic Trip Logic to be OPERABLE. Having two OPERABLE channels ensures that random failure of a single logic channel will not prevent reactor trip.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these RTS P trip Functions must be OPERABLE when the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

Move Function 20 here from pages B 3.3.1-25 and B 3.3.1-26

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

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All changes are 1 unless otherwise noted

BASES

ACTIONS

-----------------------------------REVIEWER'S NOTE-----------------------------------
~~In Table 3.3.1-1, Functions 11.a and 11.b were not included in the generic evaluations approved in either WCAP-10271, as supplemented, WCAP-15376, or WCAP-14333. In order to apply the WCAP-10271, as supplemented, and WCAP-15376 or WCAP-14333 TS relaxations to plant specific Functions not evaluated generically, licensees must submit plant specific evaluations for NRC review and approval.~~
--- 7

A Note has been added to 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 3.3.1-1.

In the event a channel's ~~[~~NTSP~~]~~ ~~Trip Setpoint~~ is found non-conservative with respect to the Allowable Value, or the channel is not functioning as required, or the transmitter, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected. 2

When the number of inoperable channels in a trip Function exceed those specified in one or other related Conditions associated with a trip Function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 must be immediately entered if applicable in the current MODE of operation.

-----------------------------------REVIEWER'S NOTE-----------------------------------
~~Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use these times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.~~
--- 7

A.1

Condition A applies to all R~~T~~S P protection Functions. Condition A addresses the situation where one or more required channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.1-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

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All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

B.1 and B.2

RPIR

Condition B applies to the Manual Reactor Trip in MODE 1 or 2. This action addresses the train orientation of the SSPS for this Function. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 48 hours. In this Condition, the remaining OPERABLE channel is adequate to perform the safety function.

The Completion Time of 48 hours is reasonable considering that there are two automatic actuation trains and another manual initiation channel OPERABLE, and the low probability of an event occurring during this interval.

If the Manual Reactor Trip Function cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 additional hours (54 hours total time). The 6 additional hours to reach MODE 3 is reasonable, based on operating experience, to reach MODE 3 from full power operation in an orderly manner and without challenging unit systems. With the unit in MODE 3, ACTION C would apply to any inoperable Manual Reactor Trip Function if the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

C.1, C.2.1, and C.2.2

Condition C applies to the following reactor trip Functions in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted:

- Manual Reactor Trip, ; 3
- RTBs, ; 3
- RTB Undervoltage and Shunt Trip Mechanisms, and ; 3
- Automatic Trip Logic.

RPIR

This action addresses the train orientation of the SSPS for these Functions. With one channel or train inoperable, the inoperable channel or train must be restored to OPERABLE status within 48 hours. If the affected Function(s) cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be placed in a MODE in

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

which the requirement does not apply. To achieve this status, action must be initiated within the same 48 hours to ensure that all rods are fully inserted, and the Rod Control System must be placed in a condition incapable of rod withdrawal within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With rods fully inserted and the Rod Control System incapable of rod withdrawal, these Functions are no longer required.

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

D.1.1, D.1.2, D.2.1, D.2.2, and D.3

Condition D applies to the Power Range Neutron Flux - High Function.

The NIS power range detectors provide input to the Rod Control System and ~~the SG Water Level Control System and~~, therefore, have a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in WCAP-14333-P-A (Ref. 8).

In addition to placing the inoperable channel in the tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 78 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design limits. With one of the NIS power range detectors inoperable, 1/4 of the radial power distribution monitoring capability is lost.

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 72 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels < 75% RTP. The 12 hour Frequency is consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)."

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All changes are 1 unless otherwise noted

ACTIONS (continued)

As an alternative to the above Actions, the plant must be placed in a MODE where this Function is no longer required OPERABLE. Seventy-eight hours are allowed to place the plant in MODE 3. The 78 hour Completion Time includes 72 hours for channel corrective maintenance, and an additional 6 hours for the MODE reduction as required by Required Action D.3. This is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.

[The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypass condition for up to 12 hours while performing routine surveillance testing of other channels. The Note also allows placing the inoperable channel in the bypass condition to allow setpoint adjustments of other channels when required to reduce the setpoint in accordance with other Technical Specifications. The 12 hour time limit is justified in Reference 8.] 8

8

----------------------------------REVIEWER'S NOTE-----------------------------------
The below text should be used for plants with installed bypass test capability:

~~The Required Actions are modified by a Note that allows placing one channel in bypass for 12 hours while performing routine surveillance testing, and setpoint adjustments when a setpoint reduction is required by other Technical Specifications. The 12 hour time limit is justified in Reference 8.~~ 8

Required Action D.2.2 has been modified by a Note which only requires SR 3.2.4.2 to be performed if the Power Range Neutron Flux input to QPTR becomes inoperable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. As such, determining QPTR using this movable incore detectors once per 12 hours may not be necessary.

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux - Low; 3
- Overtemperature ΔT; 3
- Overpower ΔT; 3
- Power Range Neutron Flux - High Positive Rate; 3
- Power Range Neutron Flux - High Negative Rate; 3
- Pressurizer Pressure - High; 3
- SG Water Level - Low Low; and 3
- SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch.

A known inoperable channel must be placed in the tripped condition within 72 hours. Placing the channel in the tripped condition results in a partial trip condition requiring only one-out-of-two logic for actuation of the two-out-of-three trips and one-out-of-three logic for actuation of the two-out-of-four trips. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in Reference 8.

If the inoperable channel cannot be placed in the trip condition within the specified Completion Time, the unit must be placed in a MODE where these Functions are not required OPERABLE. An additional 6 hours is allowed to place the unit in MODE 3. Six hours is a reasonable time, based on operating experience, to place the unit in MODE 3 from full power in an orderly manner and without challenging unit systems.

[The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 8.] 8

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

~~-------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The below text should be used for plants with installed bypass test capability:~~
~~--~~

~~The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 9.~~ 8

F.1 and F.2

Condition F applies to the Intermediate Range Neutron Flux trip when THERMAL POWER is above the P-6 setpoint and below the P-10 setpoint and one channel is inoperable. Above the P-6 setpoint and below the P-10 setpoint, the NIS intermediate range detector performs the monitoring Functions. If THERMAL POWER is greater than the P-6 setpoint but less than the P-10 setpoint, 24 hours is allowed to reduce THERMAL POWER below the P-6 setpoint or increase to THERMAL POWER above the P-10 setpoint. The NIS Intermediate Range Neutron Flux channels must be OPERABLE when the power level is above the capability of the source range, P-6, and below the capability of the power range, P-10. If THERMAL POWER is greater than the P-10 setpoint, the NIS power range detectors perform the monitoring and protection functions and the intermediate range is not required. The Completion Times allow for a slow and controlled power adjustment above P-10 or below P-6 and take into account the redundant capability afforded by the redundant OPERABLE channel, and the low probability of its failure during this period. This action does not require the inoperable channel to be tripped because the Function uses one-out-of-two logic. Tripping one channel would trip the reactor. Thus, the Required Actions specified in this Condition are only applicable when channel failure does not result in reactor trip.

G.1 and G.2

Condition G applies to two inoperable Intermediate Range Neutron Flux trip channels in MODE 2 when THERMAL POWER is above the P-6 setpoint and below the P-10 setpoint. Required Actions specified in this Condition are only applicable when channel failures do not result in reactor trip. Above the P-6 setpoint and below the P-10 setpoint, the NIS intermediate range detector performs the monitoring Functions. With no intermediate range channels OPERABLE, the Required Actions are to suspend operations involving positive reactivity additions immediately. This will preclude any power level increase since there are no

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

OPERABLE Intermediate Range Neutron Flux channels. The operator must also reduce THERMAL POWER below the P-6 setpoint within two hours. Below P-6, the Source Range Neutron Flux channels will be able to monitor the core power level. The Completion Time of 2 hours will allow a slow and controlled power reduction to less than the P-6 setpoint and takes into account the low probability of occurrence of an event during this period that may require the protection afforded by the NIS Intermediate Range Neutron Flux trip.

Required Action G.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.

H.1

Condition H applies to one inoperable Source Range Neutron Flux trip channel when in MODE 2, below the P-6 setpoint, and performing a reactor startup. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the two channels inoperable, operations involving positive reactivity additions shall be suspended immediately.

This will preclude any power escalation. With only one source range channel OPERABLE, core protection is severely reduced and any actions that add positive reactivity to the core must be suspended immediately.

Required Action H.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.

I.1

Condition I applies to two inoperable Source Range Neutron Flux trip channels when in MODE 2, below the P-6 setpoint, and in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With both source range channels inoperable, the RTBs must be opened immediately. With the RTBs open, the core is in a more stable condition.

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

J.1, J.2.1, and J.2.2

Condition J applies to one inoperable source range channel in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the source range channels inoperable, 48 hours is allowed to restore it to an OPERABLE status. If the channel cannot be returned to an OPERABLE status, action must be initiated within the same 48 hours to ensure that all rods are fully inserted, and the Rod Control System must be placed in a condition incapable of rod withdrawal within the next hour.

K.1 and K.2

Condition K applies to the following reactor trip Functions:

- Pressurizer Pressure - Low, ; 3
- Pressurizer Water Level - High, ; 3
- Reactor Coolant Flow – Low, ; 3
- Undervoltage RCPs, and ; 3
- Underfrequency RCPs.

With one channel inoperable, the inoperable channel must be placed in the tripped condition within 72 hours (Ref. 8). For the Pressurizer Pressure - Low, Pressurizer Water Level - High, Undervoltage RCPs, and Underfrequency RCPs trip Functions, placing the channel in the tripped condition when above the P-7 setpoint results in a partial trip condition requiring only one additional channel to initiate a reactor trip. For the Reactor Coolant Flow - Low trip Function, s placing the channel in the (tripped condition when above the P-8 setpoint results in a partial trip condition requiring only one additional channel for the Reactor Coolant Flow – Low Function) in the same loop to initiate a reactor trip. ~~For the latter trip Function, two tripped channels in two RCS loops are required to~~ 12

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All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

initiate a reactor trip when below the P-8 setpoint and above the P-7 setpoint. These Functions do not have to be OPERABLE below the P-7 setpoint because there are no loss of flow trips below the P-7 setpoint. There is insufficient heat production to generate DNB conditions below the P-7 setpoint. The 72 hours allowed to place the channel in the tripped condition is justified in Reference 8. An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time. 12

Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant OPERABLE channel, and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition K.

[The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 8.] 8 8

-----------------------------------REVIEWER'S NOTE-----------------------------------
The below text should be used for plants with installed bypass test capability:

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 8. 8

L.1 and L.2

Condition L applies to the RCP Breaker Position (Single Loop) reactor trip Function. There is one breaker position device per RCP breaker. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within [6] hours. If the channel cannot be restored to OPERABLE status within the [6] hours, then THERMAL POWER must be reduced below the P-8 setpoint within the next 4 hours. 4

This places the unit in a MODE where the LCO is no longer applicable. This Function does not have to be OPERABLE below the P-8 setpoint because other RTS Functions provide core protection below the P-8 setpoint. The [6] hours allowed to restore the channel to OPERABLE 4
P

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

status and the 4 additional hours allowed to reduce THERMAL POWER to below the P-8 setpoint are justified in Reference 11. 8 10

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to [4] hours while performing routine surveillance testing of the other channels. The [4] hour time limit is justified in Reference 11. 8 4 10

M.1 and M.2

Condition M applies to the RCP Breaker Position (Two Loops) reactor trip Function. There is one breaker position device per RCP breaker. With one channel inoperable, the inoperable channel must be placed in trip within [6] hours. If the channel cannot be placed in trip within the [6] hours, then THERMAL POWER must be reduced below the P-7 setpoint within the next 6 hours. 4

This places the unit in a MODE where the LCO is no longer applicable. This Function does not have to be OPERABLE below the P-7 setpoint because other RTS Functions provide core protection below the P-7 setpoint. The [6] hours allowed to place the channel in trip and the 6 additional hours allowed to reduce THERMAL POWER to below the P-7 setpoint are justified in Reference 11. 8 P 4 10

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to [4] hours while performing routine surveillance testing of the other channels. The [4] hour time limit is justified in Reference 11. 8 4 10

Move to after ACTIONS R.1 and R.2 on page B 3.3.1-48

S

N.1 and N.2 5

S

Condition N applies to Turbine Trip on Low Fluid Oil Pressure or on Turbine Stop Valve Closure. With one channel inoperable, the inoperable channel must be placed in the trip condition within 72 hours. If placed in the tripped condition, this results in a partial trip condition requiring only one additional channel to initiate a reactor trip. If the channel cannot be restored to OPERABLE status or placed in the trip condition, then power must be reduced below the P-9 setpoint within the next 4 hours. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in Reference 8. Four hours is allowed for reducing power. 7

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

Move to after ACTIONS R.1 and R.2 on page B 3.3.1-48

[The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 8.] 8

-----------------------------------REVIEWER'S NOTE-----------------------------------
The below text should be used for plants with installed bypass test capability:

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 8.

~~O~~.1 and ~~O~~.2

Condition ~~O~~ applies to the ~~SI Input from ESFAS reactor trip and the~~ RTS Automatic Trip Logic in MODES 1 and 2. These actions address the train orientation of the RTS for these Functions. With one train inoperable, 24 hours are allowed to restore the train to OPERABLE status (Required Action ~~O~~.1) or the unit must be placed in MODE 3 within the next 6 hours. The Completion Time of 24 hours (Required Action ~~O~~.1) is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function and given the low probability of an event during this interval. The 24 hours allowed to restore the inoperable RTS Automatic Trip Logic train to OPERABLE status is justified in Reference 8. The Completion Time of 6 hours (Required Action ~~O~~.2) is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems.

The Required Actions have been modified by a Note that allows bypassing one train up to [4] hours for surveillance testing, provided the other train is OPERABLE. [The [4] hour time limit for testing the RTS Automatic Trip logic train may include testing the RTB also, if both the Logic test and RTB test are conducted within the [4] hour time limit. The [4] hour time limit is justified in Reference 8.] 9

-----------------------------------REVIEWER'S NOTE-----------------------------------
The below text should replace the bracketed information in the previous paragraph if WCAP-14333 and WCAP-15376 are being incorporated:

The [4] hour time limit for the RTS Automatic Trip Logic train testing is greater than the 2 hour time limit for the RTBs, which the logic train

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

supports. The longer time limit for the logic train ([4] hours) is acceptable based on Reference 12 8

P.1 and P.2 5

---REVIEWER'S NOTE---

WCAP-14333-P-A, Rev. 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," and the associated TSTF (TSTF-418) and WCAP-15376-P, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times," and the associated TSTF (TSTF-411) both modify Condition P.

WCAP-14333-P-A, Rev. 1 and the associated TSTF-418 provide a Completion Time for Required Action P.1 of 1 hour and Required Action P.2 of 7 hours. WCAP-14333-P-A, Rev. 1 contains three Notes to TS 3.3.1 Condition P. Note 1 states, "One train may be bypassed for up to 2 hours for surveillance testing, provided the other train is OPERABLE." Note 2 states, "One RTB may be bypassed for up to 2 hours for maintenance on undervoltage or shunt trip mechanisms, provided the other train is OPERABLE." WCAP-14333-P-A, Rev. 1 also adds a third Note, which states: "One RTB train may be bypassed for up to [4] hours for concurrent surveillance testing of the RTB and automatic trip logic, provided the other train is OPERABLE." 9

WCAP-15376-P and the associated TSTF-411 provide a Completion Time for Required Action P.1 of 24 hours and Required Action P.2 of 30 hours. WCAP-15376-P relaxes the time that an RTB train may be bypassed for surveillance testing from 2 hours to 4 hours, and deletes Notes 2 and 3 that are added by WCAP-14333-P-A, Rev. 1.

Implementation of TS 3.3.1, Condition P:

1. If WCAP-14333-P-A, Rev. 1 is implemented without implementing WCAP-15376-P, the Completion Time for Required Action P.1 will be 1 hour and for Required Action P.2 will be 7 hours. Condition P will contain the three Notes as discussed above, with 2 hours to bypass an RTB train for surveillance testing in Note 1.

2. If WCAP-15376-P is implemented without implementing WCAP-14333-P-A, Rev. 1, the Completion Time for Required Action P.1 will be 24 hours and for Required Action P.2 will be 30 hours. Condition P will only contain one Note (Note 1 as discussed in the first

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

paragraph above), with 4 hours to bypass an RTB train for surveillance testing in the Note.

3. If WCAP-14333-P-A, Rev. 1, and WCAP-15376-P are both implemented, follow the direction for Item 2, above.

Use the following Bases if WCAP-14333-P-A, Rev. 1 is adopted without adopting WCAP-15376-P:

Condition P applies to the RTBs in MODES 1 and 2. These actions address the train orientation of the RTS for the RTBs. With one train inoperable, 1 hour is allowed to restore the train to OPERABLE status or the unit must be placed in MODE 3 within the next 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. The 1 hour and 6 hour Completion Times are equal to the time allowed by LCO 3.0.3 for shutdown actions in the event of a complete loss of RTS Function. Placing the unit in MODE 3 results in Condition C entry while an RTB is inoperable.

The Required Actions have been modified by three Notes. Note 1 allows one channel to be bypassed for up to 2 hours for surveillance testing, provided the other train is OPERABLE. Note 1 applies to RTB testing that is performed independently from the corresponding automatic trip logic testing. Note 2 allows one RTB to be bypassed for up to 2 hours for maintenance if the other RTP train is OPERABLE. The 2 hour time limit is justified in Reference 9. Note 3 applies to RTB testing that is performed concurrently with the corresponding automatic trip logic test. For concurrent testing of the automatic trip logic and RTB, one RTB train may be bypassed for up to [4] hours provided the other train is OPERABLE. The [4] hour time limit is approved by Reference 8. 9

Use the following Bases if WCAP-15376-P is adopted without adopting WCAP-14333-P-A, Rev. 1 or if both are adopted:

O P

Condition ~~P~~ applies to the RTBs in MODES 1 and 2. These actions address the train orientation of the ~~RTS~~ for the RTBs. With one train inoperable, 24 hours is allowed for train corrective maintenance to restore the train to OPERABLE status or the unit must be placed in MODE 3 within the next 6 hours. The 24 hour Completion Time is justified in Reference ~~13~~ 12. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. 5 10

All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

Placing the unit in MODE 3 results in Condition C entry while an RTB is inoperable.

The Required Actions have been modified by a Note. The Note allows one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. The 4 hour time limit is justified in Reference ~~13~~ 12. 10

--- 9

P

~~Q~~.1 and ~~Q~~.2 5

P

Condition ~~Q~~ applies to the P-6 and P-10 interlocks. With one or more channels inoperable for one-out-of-two or two-out-of-four coincidence logic, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour or the unit must be placed in MODE 3 within the next 6 hours. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. The 1 hour and 6 hour Completion Times are equal to the time allowed by LCO 3.0.3 for shutdown actions in the event of a complete loss of RTS P Function. 5

Q

~~R~~.1 and ~~R~~.2 5

Q

Condition ~~R~~ applies to the P-7, P-8, ~~P-9,~~ and P-13 interlocks. With one or more channels inoperable for one-out-of-two or two-out-of-four coincidence logic, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour or the unit must be placed in MODE 2 within the next 6 hours. These actions are conservative for the case where power level is being raised. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems. 5

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All changes are 1 unless otherwise noted

BASES

ACTIONS (continued)

R

~~S~~.1 and ~~S~~.2 5

R

Condition ~~S~~ applies to the RTB Undervoltage and Shunt Trip Mechanisms, or diverse trip features, in MODES 1 and 2. With one of the diverse trip features inoperable, it must be restored to an OPERABLE status within 48 hours or the unit must be placed in a MODE where the requirement does not apply. This is accomplished by placing the unit in MODE 3 within the next 6 hours (54 hours total time). The Completion Time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. ~~With the unit in MODE 3, ACTION C would apply to any inoperable RTB trip mechanism. The affected RTB shall not be bypassed while one of the diverse features is inoperable except for the time required to perform maintenance to one of the diverse features. The allowable time for performing maintenance of the diverse features is 2 hours for the reasons stated under Condition P.~~ 5 13

R

The Completion Time of 48 hours for Required Action ~~S~~.1 is reasonable considering that in this Condition there is one remaining diverse feature for the affected RTB, and one OPERABLE RTB capable of performing the safety function and given the low probability of an event occurring during this interval. 5

Move ACTIONS S.1 and S.2 on page B 3.3.1-43 and page B 3.3.1-44 here

SURVEILLANCE REQUIREMENTS

~~-----REVIEWER'S NOTE-----~~
~~In Table 3.3.1-1, Functions 11.a and 11.b were not included in the generic evaluations approved in either WCAP-10271, as supplemented, or WCAP-14333. In order to apply the WCAP-10271, as supplemented, and WCAP-14333 TS relaxations to plant specific Functions not evaluated generically, licensees must submit plant specific evaluations for NRC review and approval.~~
~~-----~~ 7

All changes are 1 unless otherwise noted

P

BASES

SURVEILLANCE REQUIREMENTS (continued)

P

The SRs for each RTS Function are identified by the SRs column of Table 3.3.1-1 for that Function.

A Note has been added to the SR Table stating that Table 3.3.1-1 determines which SRs apply to which RTS Functions.

P

P

Note that each channel of process protection supplies both trains of the RTS. When testing Channel I, Train A and Train B must be examined. Similarly, Train A and Train B must be examined when testing Channel II, Channel III, and Channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

2

-----------------------------------REVIEWER'S NOTE-----------------------------------
~~Certain Frequencies are based on approval topical reports. In order for a licensee to use these times, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~

7

SR 3.3.1.1

Performance of the CHANNEL CHECK once every 12 hours 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. A 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 unit 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.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the power range channel output every 24 hours. If the calorimetric heat balance calculation results exceed the power range channel output by more than 2% RTP, the power range channel is not declared inoperable, but must be adjusted. The power range channel output shall be adjusted consistent with the calorimetric heat balance calculation results if the calorimetric calculation exceed the power range channel output by more than + 2% RTP. If the power range channel output cannot be properly adjusted, the channel is declared inoperable.

If the calorimetric is performed at part power (< [70]% RTP), adjusting the power range channel indication in the increasing power direction will assure a reactor trip below the safety analysis limit (< [118]% RTP). Making no adjustment to the power range channel in the decreasing power direction due to a part power calorimetric assures a reactor trip consistent with the safety analyses. 4 4

This allowance does not preclude making indicated power adjustments, if desired, when the calorimetric heat balance calculation is less than the power range channel output. To provide close agreement between indicated power and to preserve operating margin, the power range channels are normally adjusted when operating at or near full power during steady-state conditions. However, discretion must be exercised if the power range channel output is adjusted in the decreasing power direction due to a part power calorimetric (< [70]% RTP). This action may introduce a non-conservative bias at higher power levels which may result in an NIS reactor trip above the safety analysis limit (> [118]% RTP). The cause of the potential non-conservative bias is the decreased accuracy of the calorimetric at reduced power conditions. The primary error contributor to the instrument uncertainty for a secondary side power calorimetric measurement is the feedwater flow measurement, which is typically a ΔP measurement across a feedwater venturi. While the measurement uncertainty remains constant in ΔP as power decreases, when translated into flow, the uncertainty increases as a square term. Thus a 1% flow error at 100% power can approach a 10% flow error at 4 4

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

30% RTP even though the ΔP error has not changed. An evaluation of extended operation at part power conditions would conclude that it is prudent to administratively adjust the setpoint of the Power Range Neutron Flux - High bistables to ≤ [85]% RTP when: 1) the power range channel output is adjusted in the decreasing power direction due to a part power calorimetric below [70]% RTP; or 2) for a post refueling startup. The evaluation of extended operation at part power conditions would also conclude that the potential need to adjust the indication of the Power Range Neutron Flux in the decreasing power direction is quite small, primarily to address operation in the intermediate range about P-10 (nominally 10% RTP) to allow enabling of the Power Range Neutron Flux - Low setpoint and the Intermediate Range Neutron Flux reactor trips. Before the Power Range Neutron Flux - High bistables are reset to ≤ [109]% RTP, the power range channel adjustment must be confirmed based on a calorimetric performed at ≥ [70]% RTP. 4 4 4 4

~~-----REVIEWER'S NOTE-----~~
~~A plant specific evaluation based on the guidance in Westinghouse Technical Bulletin ESBU-TB-92-14 is required to determine the power level below which power range channel adjustments in a decreasing power direction become a concern. This evaluation must reflect the plant specific RTS setpoint study. In addition, this evaluation should determine if additional administrative controls are required for Power Range Neutron Flux-High trip setpoint setting changes~~ 7
~~----------~~

The Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours are allowed for performing the first Surveillance after reaching 15% RTP. A power level of 15% RTP is chosen based on plant stability, i.e., automatic rod control capability and turbine generator synchronized to the grid.

The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate that a difference between the calorimetric heat balance calculation and the power range channel output of more than +2% RTP is not expected in any 24 hour period.

In addition, control room operators periodically monitor redundant indications and alarms to detect deviations in channel outputs.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. The excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%.

If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the overtemperature ΔT Function.

A Note clarifies that the Surveillance is required only if reactor power is ≥ ~~[~~15% ~~]~~ RTP and that 24 hours is allowed for performing the first Surveillance after reaching ~~[~~15% ~~]~~ RTP. 4

The Frequency of every 31 EFPD is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Also, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT every 62 31 days ~~on a STAGGERED TEST BASIS~~. This test shall verify OPERABILITY by actuation of the end devices. 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 TADOT 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. 5

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of every 31 days is acceptable, based on unit operating experience.

~~The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 13.~~ 5

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The RPIR SSPS is tested every 92 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function, including operation of the P-7 permissive which is a logic function only. The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference 13. 12 The SR is modified by a Note, that states that for Function 16.b, when ≥ 10% RTP, the SR consists only of verifying the P-7 interlock is in its required state. However, all the applicable requirements of an ACTUATION LOGIC TEST are required to be performed within 12 hours of reducing THERMAL POWER to < 10% RTP. For Function 16.b, the SR cannot be completely performed in MODE 1 when ≥ 10% RTP since the Turbine Impulse Pressure relays cannot be cycled at power. 10 5

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore detector measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the overtemperature ΔT Function.

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is > 50% RTP and that [24] hours is allowed for performing the first surveillance after reaching 50% RTP. 4

The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT every 184 days. INSERT 5 2

A COT is performed on each required channel to ensure the entire channel will perform the 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 COT 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.

~~Setpoints must be within the Allowable Values specified in Table 3.3.1-1.~~ 2

~~The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.~~ 2

~~The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 9.~~ 2

SR 3.3.1.7 is modified by a Note that provides a 4 hour~~s~~ delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3. 6

The Frequency of 184 days is justified in Reference 9.

2

INSERT 5

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the 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.

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All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

INSERT 6

and 12 hours after reducing power below P-10

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. 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 COT 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 modified by a Note that allows this surveillance to be satisfied if it has been performed within 184 days of the Frequencies prior to reactor startup and four hours after reducing power below ~~P-10 and~~ P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of ~~[~~12~~]~~ hours after reducing power below P-10 (applicable to intermediate and power range low channels) and 4 hours after reducing power below P-6 (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every ~~92~~ 184 days thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup and ~~[~~12~~]~~ and four hours after reducing power below P-10 or P-6, respectively. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than ~~[~~12~~]~~ hours or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the time limit. ~~[~~Twelve~~]~~ hours and four hours are reasonable times to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > ~~[~~12~~]~~ and 4 hours, respectively. The Frequency of 184 days is justified in Reference ~~13~~ 12.

2 5 4 6 4 4 4 4 10

2

INSERT 6

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the 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.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every [92] days, as justified in Reference 9. 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 TADOT 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. 4

The SR is modified by a Note that excludes verification of setpoints from the TADOT. Since this SR applies to RCP undervoltage and underfrequency relays, setpoint verification requires elaborate bench calibration and is accomplished during the CHANNEL CALIBRATION.

SR 3.3.1.10

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. 4

INSERT 7

~~CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.~~ 2

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

~~SR 3.3.1.10 is modified by a Note stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable.~~ 5

2

INSERT 7

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the 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.

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All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every [18] months. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the power range neutron detectors consists of a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP. The CHANNEL CALIBRATION for the source range and intermediate range neutron detectors consists of obtaining the detector plateau or preamp discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. This Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1, and is not required for the NIS intermediate range detectors for entry into MODE 2, because the unit must be in at least MODE 2 to perform the test for the intermediate range detectors and MODE 1 for the power range detectors. 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 on the [18] month Frequency. 4 2 4 4

INSERT 8

SR 3.3.1.12

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every [18] months. This SR is modified by a Note stating that this test shall include verification of the RCS resistance temperature detector (RTD) bypass loop flow rate. 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. ¶ 4 2

INSERT 9

This test will verify the rate lag compensation for flow from the core to the RTDs.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

2

INSERT 8

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the 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.

2

INSERT 9

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the 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.

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All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every [18] months. 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 COT 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. 4

The Frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, and RCP Breaker Position~~, and the SI Input from ESFAS~~. 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 TADOT 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 TADOT is performed every [18] months. The test shall independently verify the OPERABILITY of the undervoltage and shunt trip mechanisms for the Manual Reactor Trip Function for the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip. 5 4

The Frequency is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. 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 TADOT 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 TADOT is as described in SR 3.3.1.4, except that this test is performed prior to exceeding the [P-9] interlock whenever the unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the [P-9] interlock. 7 5 7 5

~~SR 3.3.1.16~~

~~SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Technical Requirements Manual, Section 15 (Ref. 14). 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 equipment reaches the required functional state (i.e., control and shutdown rods fully inserted in the reactor core).~~

~~For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, with the resulting measured response time compared to the appropriate FSAR response time. Alternately, the response time test can be performed with the time constants set to their nominal value, provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.~~ 11

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A and/or WCAP-14036-P.~~
~~--~~

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 10) 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 WCAP. Response time verification for other sensor types must be demonstrated by test.

[WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 15) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time.] The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter. 11

As appropriate, each channel's response must be verified every [18] months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 months Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

All changes are 1 unless otherwise noted

BASES

REFERENCES

1. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."
2. ~~F~~SAR, Chapter ~~[~~7~~]~~. U 4
3. ~~F~~SAR, Chapter ~~[~~6~~]~~. U 4
4. ~~F~~SAR, Chapter ~~[15]~~. 14 4
5. IEEE-279-~~1971~~ 1968.
6. 10 CFR 50.49.
7. ~~Plant specific setpoint methodology study.~~ Technical Report EE-0116, Revision 5, "Allowable Values for North Anna Improved Technical Specifications (ITS) Table 3.3.1-1 and 3.3.2-1, Setting Limits for Surry Custom Technical Specifications (CTS), Sections 2.3 and 3.7, and Allowable Values for Kewaunee Power Station Improved Technical Specifications (ITS) Functions listed in Specification 5.5.16."
8. WCAP-14333-P-A, Rev. 1, October 1998.
9. WCAP-10271-P-A, Supplement 1, May 1986.
10. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.
11. ~~[Plant specific evaluation reference].~~
11 ~~12~~. WCAP-10271-P-A, Supplement 2, June 1990.
12 ~~13~~. WCAP-15376, Rev. 0, October 2000.
~~14. Technical Requirements Manual, Section 15, "Response Times."~~
~~15. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995.~~

10

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

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

2. Changes are made to the ISTS Bases that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this adoption strategy, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications.

3. The punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

5. Changes are made to reflect changes made to the Specifications.

6. Typographical error corrected.

7. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

8. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. Required Actions for Conditions D, E, K, and N are modified by a Note that provides two options for bypassing a channel for up to 12 hours for the purpose of performing surveillance testing without requiring entry into the applicable Required Actions. One option is for plants that have installed bypass testing capabilities. The other option is for plants that do not have installed bypass testing capabilities. KPS does not have installed bypass testing capabilities. Therefore, the Note for plants that do not have bypass testing capabilities is retained for Condition D, E, K, and N (which is Condition S in the KPS ITS).

9. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design. Also, the Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal. Furthermore, the bracketed value and the Reviewer's Note allows options dependent upon if the plant is incorporating WCAP-14333 and WCAP-15376. Since KPS is incorporating both of the WCAPs, the correct section has been selected. In addition, it should be noted that the

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

Reviewer's Note for ISTS 3.3.1 Actions O.1 and O.2 should have stated that the alternate wording is required if WCAP-14333 and WCAP-15376 are not adopted, not if they are adopted. WCAP-15376 justified a 4 hour RTB test time.

10. The Bases References have been changed to reflect the plant specific references. As such, when a reference has been deleted, the subsequent reference number has been changed.

11. Response Time testing has been deleted. See ITS 3.3.1 JFD 7 for justification for exclusion of Response Time testing.

12. ISTS Table 3.3.1-1 Function 12 (Undervoltage RCPs) and 13 (Underfrequency RCPs) require three channels per bus. ITS Table 3.3.1-1 Function 12 (Undervoltage RCPs) and 13 (Underfrequency RCPs) trip functions require two channels per bus. Therefore, the statement in ISTS ACTION K bases which states that two tripped channels in two RCS loops are required to initiate a reactor trip when below the P-8 setpoint and above the P-7 setpoint has been deleted.

13. The statement in ISTS ACTION S (ITS ACTION R) which states that ACTION C applies when in MODE 3, is not retained in the KPS ITS. ISTS Table 3.3.1-1 Functions 20 (ITS Table 3.3.1-1 Function 18) and 21 (ITS Table 3.3.1-1 Function 19) clearly show that in MODES 3, 4 and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted, the ACTION C shall be entered. Therefore, reiterating it in the ITS Bases for ITS ACTION R is not required.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

ATTACHMENT 2

ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

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

ITS A01 ITS 3.3.2

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. LA01

LCO 3.3.2, DOC A02

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5. See ITS 3.3.5

Add proposed ACTIONS Note A02

ACTION A

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable. See ITS 3.3.5

Notes for ACTIONS D, E, G, and H

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip. See ITS 3.3.5 L08

e. The accident monitoring instrumentation in Table TS 3.5-6 shall be OPERABLE whenever the plant is above HOT SHUTDOWN. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes. A change in operational MODES or conditions is acceptable with an inoperable accident monitoring instrumentation channel(s). See ITS 3.3.3

ITS

ITS 3.3.2

Table 3.3.2-1, Function 1.d
Table 3.3.2-1, Function 4.c
Table 3.3.2-1, Function 2.c
Table 3.3.2-1, Function 1.c

A01

TABLE TS 3.5-1

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

LA01

NO.	FUNCTIONAL UNIT	CHANNEL	SETTING LIMIT
1	High Containment Pressure (Hi)	Safety injection[(1)] LA02	≤ 4 psig
2	High Containment Pressure (Hi-Hi)	a. Containment spray	≤ 23 psig
		b. Steam line isolation of both lines	≤ 17 psig
3	Pressurizer Low Pressure	Safety injection[(1)]	≥ 1815 psig
4	Low Steam Line Pressure	Safety injection[(1)] LA02	≥ 500 psig
		Lead time constant	≥ 12 seconds
		Lag time constant	≤ 2 seconds
5	High Steam Flow in a Steam Line Coincident with Safety Injection and "Lo-Lo" T_{avg}	Steam line isolation of affected line[(2)] LA03	≤ d/p corresponding to 0.745 x 10^6 lb/hr at 1005 psig ≥ 540°F
6	High-High Steam Flow in a Steam Line Coincident with Safety Injection	Steam line isolation of affected line[(2)]	≤ d/p corresponding to 4.4 x 10^6 lb/hr at 735 psig
7	Forebay Level	Trip circ. water pumps	

LA01

See ITS 3.7.8

Table 3.3.2-1, Function 4.e
Table 3.3.2-1, Function 4.d; footnote (c)
Table 3.3.2-1, Function 1.e

LA02

(1) Initiates containment isolation, feedwater line isolation, shield building ventilation, auxiliary building special vent, and starting of all containment fans. In addition, the signal overrides any bypass on the accumulator valves.

L10

(2) Confirm main steam isolation valves closure within 5 seconds when tested. d/p = differential pressure

LA03

Amendment 172
02/27/2004

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ITS

ITS 3.3.2

A01

TABLE TS 3.5-2

See ITS 3.3.1

LA04

INSTRUMENT OPERATION CONDITIONS FOR REACTOR TRIP

A03

REQUIRED

LA04

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
9	Pressurizer High Water Level	3	2	2	-	P-7	Maintain HOT SHUTDOWN
10	Low Flow In One Loop	3/loop	2/loop (any loop)	2	-	P-8	Maintain HOT SHUTDOWN
	Low Flow Both Loops	3/loop	2/loop (both loops)	2	-	P-7	Maintain HOT SHUTDOWN
11	Deleted						
12	Lo-Lo Steam Generator Water Level	3/loop	2/loop	2/loop	-		Maintain HOT SHUTDOWN
13	Undervoltage 4-kV	2/bus	1/bus (both buses)	1/bus 2	-	P-7	Maintain HOT SHUTDOWN
14	Underfrequency 4-kV Bus(4)	2/bus	1/bus (both buses)	1/bus	-		Maintain HOT SHUTDOWN
15	Deleted						
16	Steam Flow/Feedwater Flow Mismatch	2	1	1	-		Maintain HOT SHUTDOWN

LA04

M01

See ITS 3.3.1

See ITS 3.3.1

M05

A04

Table 3.3.2-1, Function 6.d

Add proposed ACTION H

M01

Amendment No. 94
11/12/91

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A01

TABLE TS 3.5-3

EMERGENCY COOLING

Table 3.3.2-1, Function

LA04 REQUIRED A03 LA04 L02 M10

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Safety Injection						A08
1.a	a. Manual	2	1	1 / 2 M02	-	M02 Add proposed ACTION B	HOT SHUTDOWN(1)
1.c	b. High Containment Pressure	3	2	2 / 3 M03	-	M03 Add proposed ACTION D	HOT SHUTDOWN(1)
1.e	c. Low Steam Pressure/Line	3	2 LA04	2 / 3 per steam line M03	- A09	Primary pressure < 2000 psig	HOT SHUTDOWN(1)
1.d	d. Pressurizer Low Pressure	3	2	2 / 3 M03	-	Primary pressure < 2000 psig	HOT SHUTDOWN(1)
2	Deleted					M03 Add proposed ACTION D	
3	Containment Spray						A08
2.a	a. Manual	2	2	2 M04	(2) LA04	L07 Add proposed ACTION B.1	HOT SHUTDOWN(3)
2.c	b. Hi-Hi Containment Pressure (Containment Spray)	3 sets of 2	1 of 2 in each set	1 per set / 3 sets of 2	1/set	M04 Add proposed ACTION E	HOT SHUTDOWN(3)

Table 3.3.2-1 Footnote (a)

L02

Add proposed Applicability and Required Channels for Functions1.b and 2.b A13

Add proposed ACTION C for Functions 1.b and 2.b L03

Add proposed Function 8 M16

Add proposed ACTION F

M10 L05 M17

(1) If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in COLD SHUTDOWN condition. A08

(2) Must actuate 2 switches. LA04

(3) If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in COLD SHUTDOWN condition. A08

L02

A01

Table 3.3.2-1, Function

TABLE TS 3.5-3

EMERGENCY COOLING

LA04 REQUIRED A03 LA04

NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
4	Motor-Driven Auxiliary Feedwater Pumps			3 M03			
6.b	a. Either Steam Generator Lo-Lo Level	3/loop	2/loop LA04	2/loop SG A05	- M03	Add proposed ACTION D	Maintain HOT SHUTDOWN
6.e	b. Loss of Main Feed Water(4)	1	1 LA04	1	L07	Add proposed ACTION I.1 A04	Maintain HOT SHUTDOWN
6.c	c. Safety Injection LA02	(Refer to Item 1 of this table)					M13
	d. 4 KV Buses 1-5 and 1-6 under voltage	2/bus(5)	1/bus	1/bus(6)			Maintain HOT SHUTDOWN or operate diesel generators
5	Turbine-Driven Auxiliary Feedwater Pumps			3 M03			L04
6.b	a. Both Steam Generator Lo-Lo Level	3/loop	2/loop LA04	2/loop SG A05			Maintain HOT SHUTDOWN
6.d	b. 4 KV Buses 1-1 and 1-2 under voltage	(Refer to Item 13 of Table TS 3.5-2)					Add proposed ACTION D M03

Add proposed Applicability and Required Channels for Function 6.a A13

Add proposed ACTION G for Function 6.a L03

M07

(4) Tripping of both main feedwater pump breakers starts both motor-driven auxiliary feedwater pumps. LA02

(5) Each channel consists of one instantaneous and one time-delay relay connected in series.

(6) When one component of a channel is taken out of service, that component shall be in the tripped condition. L04

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ITS | ITS 3.3.2

A01

TABLE TS 3.5-4

INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS

Table 3.3.2-1, Function | LA04 | A03 | LA04 | M11 | REQUIRED

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	~~MINIMUM~~ OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Containment Isolation						
3.c	a. Safety Injection	Refer to Item No. 1 of Table TS 3.5-3				A08	HOT SHUTDOWN(1)
3.a	b. Manual	2	1	~~1~~ 2 M02	-	M02 Add proposed ACTION B	HOT SHUTDOWN
2	Steam Line Isolation						
4.e	a. Hi-Hi Steam Flow with Safety Injection	2/loop	1	~~1~~(3) 2 per steam line M03	-	M03 Add proposed ACTION D	HOT SHUTDOWN(1)
4.d	b. Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection	2/loop	1 LA04	~~1~~(3) 2 per steam line M03	- A10	M03 Add proposed ACTION D L06	HOT SHUTDOWN(1)
4.c	c. Hi-Hi Containment Pressure	3	2	~~2~~(3) 3 M03	-	M03 Add proposed ACTION D	HOT SHUTDOWN(1)
4.a	d. Manual	1/loop	1/loop	1/loop(3)	-	L07 Add proposed ACTION F.1	HOT SHUTDOWN

Add proposed Applicability and Required Channels for Function 3.b A13

Add proposed ACTION C for Function 3.b L03

Add proposed Applicability and Required Channels for Functions 4.b A13

Add proposed ACTION G for Function 3.b L03

M12 M06

(1) If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in a COLD SHUTDOWN condition.

(3) Steam Line Isolation channels are not required to be operable when both main steam isolation valves are closed and deactivated.

L06 Table 3.3.2-1 Footnote (b)

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ITS 3.3.2

A01

TABLE TS 3.5-4

Table 3.3.2-1, Function

LA04 **INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS** A03

REQUIRED

LA04

		1	2	3	4	5	6
NO.	**FUNCTIONAL UNIT**	**NO. OF CHANNELS**	**NO. OF CHANNELS TO TRIP**	**~~MINIMUM~~ OPERABLE CHANNELS**	**MINIMUM DEGREE OF REDUNDANCY**	**PERMISSIBLE BYPASS CONDITIONS**	**OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET**
3	Containment Ventilation Isolation						
	a. High Containment Radiation	2	1	1	-	-	These channels are not required to activate containment ventilation isolation when the containment purge and ventilation system isolation valves are maintained closed.[(2)]
	b. Safety Injection	Refer to Item 1 of Table TS 3.5-3					
	c. Containment Spray	Refer to Item 3 of Table TS 3.5-3					
4	Main Feedwater Isolation						
5.b	a. Hi-Hi Steam Generator Level	~~3~~	2 LA04	~~2~~ 3 per SG M03	~~1~~ LA04 A11	M03 Add proposed ACTION D	HOT SHUTDOWN M12

Add proposed Applicability and Required Channels for Function 5.a A13

Add proposed ACTION G for Function 5.a L03

(2) The detectors are required for Reactor Coolant System leak detection as referenced in TS 3.1.d.5.

See ITS 3.3.6

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Amendment No. 102
10/18/93

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4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SR 3.3.2.1, SR 3.3.2.2, SR 3.3.2.3, SR 3.3.2.4, SR 3.3.2.5, SR 3.3.2.6, SR 3.3.2.7

SPECIFICATION

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3.

See other ITS

c. Deleted

d. Deleted

e. Deleted

ITS

ITS 3.3.2

A01

Table 3.3.2-1, Function 1.d

See ITS 3.3.1

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.4 COT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
6. Pressurizer Water Level	Each shift	Each refueling cycle	Monthly	
7. Pressurizer Pressure	Each shift	Each refueling cycle	Monthly 184 days L01	
8. a. 4-KV Voltage and Frequency	Not applicable	Each refueling cycle	Monthly	Reactor protection circuits only
b. 4-KV Voltage (Loss of Voltage)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only
c. 4-KV Voltage (Degraded Grid)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only
9. Analog Rod Position	Each shift(a,b)	Each refueling cycle	Each refueling cycle	(a) With step counters (b) Following rod motion in excess of 24 steps when computer is out of service
10. Rod Position Bank Counters	Each shift(a,b)	Not applicable	Each refueling cycle	(a) With analog rod position (b) Following rod motion in excess of 24 steps when computer is out of service

See ITS 3.3.5

See ITS 3.3.1

See ITS 3.1.4 and 3.1.7

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ITS ITS 3.3.2

A01

TABLE TS 4.1-1

Table 3.3.2-1, Function 5.b

Table 3.3.2-1, Function 6.b

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.4 COT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	~~TEST~~	REMARKS
11. a. Steam Generator Low Level	Each shift	Each refueling cycle	~~Monthly~~ 184 days	L01
b. Steam Generator High Level	Each shift	Each refueling cycle	~~Monthly~~ 184 days	L01
12. Steam Generator Flow Mismatch	Each shift	Each refueling cycle	Monthly	
13. ~~Deleted~~				
14. ~~Residual Heat Removal Pump Flow~~	~~Each shift (when in operation)~~	~~Each refueling cycle~~	~~Not applicable~~	LA06
15. ~~Deleted~~				
16. Refueling Water Storage Tank Level	Weekly	Annually	Not applicable	
17. ~~Deleted~~				

See ITS 3.3.3

See ITS 3.3.1

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02/12/2001

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A01

Table 3.3.2-1, Function 2.c

Table 3.3.2-1, Function 4.c

Table 3.3.2-1, Function 1.c

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

SR 3.3.2.1 | SR 3.3.2.6 | SR 3.3.2.4 | COT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
18. a. Containment Pressure (SIS signal)	Each shift	Each refueling cycle	Monthly (a) 184 days L01	(a) Isolation Valve Signal LA05
b. Containment Pressure (Steamline Isolation)	Each shift (a)	Each refueling cycle (a) A07	Monthly (a)	(a) Narrow range containment pressure (-3.0, +3.0 psig excluded)
c. Containment Pressure (Containment Spray Act)	Each shift	Each refueling cycle	Monthly 184 days L01	
d. Annulus Pressure (Vacuum Breaker)	Not applicable	Each refueling cycle	Each refueling cycle	
19. Radiation Monitoring System	Daily (a,b)	Each refueling cycle (a)	Quarterly (a)	(a) Includes only channels R11 thru R15, R19, R21, and R23 (b) Channel check required in all plant modes LA07
20. Deleted				
21. Containment Sump Level	Not applicable	Not applicable	Each refueling cycle	
22. Accumulator Level and Pressure	Each shift	Deleted	Not applicable	
23. Steam Generator Pressure	Each shift	Each refueling cycle	Monthly 184 days L01	

Table 3.3.2-1, Function 1.e

See ITS 3.5.1

See ITS 3.4.15

Discussion of Change LA07 is for channels R15 and R19. For the other channels, see ITS 3.3.2, 3.3.6, 3.3.7, 3.4.15, and CTS 3.8.a.9.

See ITS 3.6.9

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ITS

A01

ITS 3.3.2

TABLE TS 4.1-1

Table 3.3.1-1 Functions 1.a, 2.b, 3.b, 4.b, 5.a, and 6.a

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
24. Turbine First Stage Pressure	Each shift -1	Each refueling cycle	Monthly	See ITS 3.3.1
25. Deleted				See ITS 3.8.1
26. Protective System Logic Channel Testing	Not applicable	Not applicable	Monthly SR 3.3.2.2	Includes auto load sequencer 92 days on STAGGERED TEST BASIS L09
27. Deleted				
28. Deleted				
29. Seismic Monitoring System	Each refueling cycle	Each refueling cycle	Not applicable	See ITS 3.3.3
30. Fore Bay Water Level	Not applicable	Each refueling cycle	Each refueling cycle	See ITS 3.7.8
31. AFW Flow Rate	(a)	Each refueling cycle	Not applicable	(a) Flow rate indication will be checked at each unit startup and shutdown
32. PORV Position Indication	Monthly	Each refueling cycle	Not applicable	
a. Back-up (Temperature)	Monthly	Each refueling cycle	Not applicable	
33. PORV Block Valve Position Indicator	Monthly	Each refueling cycle	Not applicable	

See ITS 3.3.3

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04/06/2005

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ITS

ITS 3.3.2

A01

TABLE TS 4.1-1

Table 3.3.2-1, Function 6.e

See ITS 3.3.3

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

SR 3.3.2.6

SR 3.3.2.4

TADOT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	~~TEST~~	REMARKS
34. Safety Valve Position Indicator (Acoustic)	Monthly	Each refueling cycle	Not applicable	
a. Back-up (Temperature)	Monthly	Each refueling cycle	Not applicable	
35. FW Pump Trip (AFW Initiation)	Not applicable	Not applicable	Each refueling cycle	
36. Reactor Coolant System Subcooling Monitor	Monthly	Each refueling cycle	Each refueling cycle	
37. Containment Pressure (Wide Range)	Daily	Each refueling cycle	Not applicable	
38. Deleted				
39. Containment Water Level (Wide Range)	Not applicable	Not applicable	Each refueling cycle	
40. Reactor Vessel Level Indication	Monthly	Each refueling cycle	Not applicable	
41. Core Exit Thermocouples	Monthly	Each refueling cycle	Not applicable	
42. Steam Generator Level (Wide Range)	Monthly	Each refueling cycle	Not applicable	

See ITS 3.3.3

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A01

TABLE TS 4.1-1

See ITS 3.2.3
See ITS 3.7.5

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A06

SR 3.3.2.6
SR 3.3.2.4
COT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	~~TEST~~	REMARKS
43. AFW Pump Low Discharge Pressure Trip	Not Applicable	Each refueling cycle	Quarterly (a)	(a) Verification of relay setpoints not required.
44. Axial Flux Difference (AFD)	Weekly			Verify AFD within limits for each OPERABLE excore channel
45. Service Water Turbine Header Isolation Logic Trip (SW 4 A/B)	Not Applicable	Each refueling cycle	Each refueling cycle	
46. AFW Pump Low Suction Pressure Trip	Not Applicable	Each refueling cycle	Quarterly (a)	(a) Verification of relay setpoints not required.

See ITS 3.7.5
Table 3.3.2-1, Function 7.b

Add proposed SR 3.3.2.1, SR 3.3.2.4, and SR 3.3.2.6 for Functions 4.d, and 4.e
M15

Add proposed SR 3.3.2.3 and SR 3.3.2.6 for Functions 6.d
M14

Add proposed SR 3.3.2.5 for Functions 1.a, 2.a, 3.a, and 4.a
M09

Add proposed SR 3.3.2.7 for Function 8
M16

Add proposed SR 3.3.2.8 for Function 7.a
M18

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ITS

A01

ITS 3.3.2

e. Service Water System

M08

Applicability

1. The reactor shall not be made critical unless the following conditions are satisfied, except for LOW POWER PHYSICS TESTS and except as provided by TS 3.3.e.2.

See ITS 3.7.8

A. TWO service water trains are OPERABLE with each train consisting of:

1. TWO service water pumps

2. An OPERABLE flow path consisting of all valves and piping associated with the above train of components and required to function during accident conditions. This flow path shall be capable of taking a suction from the forebay and supplying water to the redundant safeguards headers.

See ITS 3.7.8

Table 3.3.2-1, Functions 7.a and 7.b, including Note (e)

3. An OPERABLE turbine building service water header isolation valve and associated isolation logic capable of closing the header isolation valve, or a closed and deactivated turbine building service water header isolation valve.

See ITS 3.7.8

A14

B. The Forebay Water Level Trip System is OPERABLE.

2. During power operation or recovery from an inadvertent trip, ONE service water train may be inoperable for a period of 72 hours. If OPERABILITY is not restored within 72 hours, then within 1 hour action shall be initiated to:

- Achieve HOT STANDBY within the next 6 hours.
- Achieve HOT SHUTDOWN within the following 6 hours.
- Achieve and maintain Reactor Coolant System T_{avg} less than 350°F by use of alternate heat removal methods within an additional 36 hours.

See ITS 3.7.8

Add proposed ACTION J

A12

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ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse 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 3.5.c and Tables TS 3.5-2 through TS 3.5-4 provide compensatory actions to take when the ESFAS instrumentation is inoperable. ITS 3.3.2 ACTIONS provide the compensatory actions for inoperable ESFAS instrumentation. ITS 3.3.2 ACTIONS include a Note that allows separate condition entry for each Function. In addition, due to the manner in which the titles for Function 1.e, 2.c, 4.d, 4.e, 5.b, 6.b, 6.c, 6.d, and 6.e are presented, a separate condition entry is allowed within a Function as follows:

a. For Function 1.e (Safety Injection – Steam Line Pressure - Low) on a per steam line basis;

b. For Function 2.c (Containment Spray – Containment Pressure - High High) on a per set basis;

c. For Function 4.d (Steam Line Isolation – High Steam Flow) on a per steam line basis;

d. For Function 4.d (Steam Line Isolation – High Steam Flow – Coincident with Safety Injection) on a per steam line basis;

e. For Function 4.d (Steam Line Isolation – High Steam Flow – Coincident with T_{avg} – Low Low) on a per loop basis;

f. For Function 4.e (Steam Line Isolation – High High Steam Flow) on a per steam line basis;

g. For Function 4.e (Steam Line Isolation – High High Steam Flow – Coincident with Safety Injection) on a per steam line basis;

h. For Function 5.b (Feedwater Isolation – SG Water Level - High High) on a per steam generator (SG) basis;

i. For Function 6.b (Auxiliary Feedwater – SG Water Level - Low Low) on a per SG basis;

j. For Function 6.d (Auxiliary Feedwater – Undervoltage Reactor Coolant Pump) on a per bus basis; and

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k. For Function 6.e (Auxiliary Feedwater – Trip of both Main Feedwater Pumps) on a per pump basis.

This modifies the CTS by providing a specific allowance to enter the Action for each inoperable ESFAS Instrumentation Function and for certain Functions on a per steam line, per set, per loop, per steam generator, per bus and per pump basis.

This change is acceptable because it clearly states the current requirement. The CTS considers each ESFAS instrument Function to be separate and independent from the other. In addition, the channels associated with Functions 1.e, 2.c, 4.d, 4.e, 5.b, 6.b, 6.c, 6.d, and 6.e are allowed separate Condition entry on the specific basis (i.e., per steam line, per set, per loop, per steam generator, per bus or per pump) since the channel associated with each steam line, set, loop, steam generator, bus or pump will provide the associated ESFAS trip based on logic associated with the channels on the specific basis. This change is designated as an administrative change because it does not result in technical changes to the CTS.

A03 Column 3 of CTS Tables TS 3.5-2, TS 3.5-3, and TS 3.5-4 specifies the "MINIMUM OPERABLE CHANNELS" associated with each Functional Unit. Column 6 of CTS Tables TS 3.5-2, TS 3.5-3, and TS 3.5-4 specifies the actions to take when the number of channels for a particular Functional Unit is less than the Column 3 requirements. ITS LCO 3.3.2 requires the ESFAS Instrumentation to be OPERABLE, and includes only one column in Table 3.3.2-1 titled "REQUIRED CHANNELS." This changes the CTS by changing the title of the MINIMUM OPERABLE CHANNELS" column to "REQUIRED CHANNELS."

This change is acceptable because the ITS Table 3.3.2-1 "REQUIRED CHANNELS" column reflects the requirements for when actions are required to be taken, consistent with the CTS column when actions must be taken. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table TS 3.5-2 Column 6 and CTS Table TS 3.5-3 Column 6 specify the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." CTS Table TS 3.5-2 Column 6 requires maintaining HOT SHUTDOWN for Functional Unit 13. Based on the CTS Table TS 3.5-2 requirement to maintain HOT SHUTDOWN, the Mode of Applicability would be considered OPERATING and HOT STANDBY. CTS Table TS 3.5-3 Column 6 requires maintaining HOT SHUTDOWN for Functional Unit 4.b. Based on the CTS Table TS 3.5-3 requirement to maintain HOT SHUTDOWN, the Mode of Applicability would be considered OPERATING and HOT STANDBY. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 6.d and 6.e states that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODE 1 and 2. This changes the CTS by explicitly stating the MODES of Applicability for each Functional Unit.

This change is acceptable because the requirements are the same. The ITS explicitly states the MODES of Applicability in ITS Table 3.3.2-1. This change is

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

A05 CTS Table TS 3.5-3 Functional Unit 4.a (Motor-Driven Auxiliary Feedwater Pumps – Either Steam Generator Lo-Lo Level) and Functional Unit 5.a (Turbine-Driven Auxiliary Feedwater Pumps – Both Steam Generator Lo-Lo Level) Column 1 ("NO. OF CHANNELS") indicates each Function has 3 channels per loop. ITS Table 3.3.2-1 Function 6.b (Auxiliary Feedwater – SG Water Level-Low Low) indicates the number of REQUIRED CHANNELS to be 3 per SG. This changes the CTS by modifying the descriptions in the " MINIMUM OPERABLE CHANNELS " column. Discussion of Change M03 discusses the change in the number of required channels.

This change is acceptable because it results in no technical changes to the Technical Specifications. The CTS Table TS 3.5-3 Functional Units 4.a and 5.a indicate the number of channels on a per loop basis. The two KPS steam generators each have three level instrumentation channels coming directly off the steam generator to measure the water level in the generator. Each steam generator is also considered a single loop such that two steam generators are considered two separate loops. Therefore, the identification of the number of OPERABLE channels on a "per loop" basis or "per SG" basis is synonymous. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 CTS 4.1.a requires calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1. Table TS 4.1-1 requires performance of a TEST at the frequencies shown on Table TS 4.1-1. ITS 3.3.2 requires the performance of either a CHANNEL OPERATIONAL TEST (COT) (SR 3.3.2.4) or a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT) (SR 3.3.2.3 or SR 3.3.2.7). This changes the CTS by changing the TEST requirements to a COT or a TADOT.

This change is acceptable because the COT or a TADOT continue to perform tests similar to the current TEST. This change is one of format only and any technical change to the requirements is specifically addressed in an individual Discussion of Change. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 Note (a) to Channel Description 18.b (Containment Pressure (Steamline Isolation)) of CTS Table TS 4.1-1 in the Remarks Section states the narrow range containment pressure instrumentation (-3.0, +3.0 excluded) is used for this Function. ITS 3.3.2 does not contain the information. This changes the CTS by deleting this remark from the Technical Specifications.

This change is acceptable because it results in no technical changes to the Technical Specifications. The information in the Note states which instrumentation is utilized for the measurement of the containment pressure for the Steam Line Isolation Function of the ESFAS Instrumentation Specification. It is an ITS convention to not include this type of reference information in the

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Specifications or in the Bases. Furthermore, this information is readily available in documents outside of the Technical Specifications. Additionally, ITS 3.3.2 will still require the instrumentation to be OPERABLE and pass their required Surveillance Requirements (SR 3.3.2.1, SR 3.3.2.4 and SR 3.3.2.6).

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

A08 CTS Table TS 3.5-3 Column 6 and CTS Table TS 3.5-4 Column 6 specify the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." CTS Table TS 3.5-3 Column 6 requires that the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 1.a and 3.a of Table TS 3.5-3 and Functional Unit 1.a of Table TS 3.5-4. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Unit 1.a of Table TS 3.5-3 and Functional Unit 1.a of Table TS 3.5-4, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. In addition, the HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (3) for Functional Unit 3.a of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Based on the CTS requirement to be in COLD SHUTDOWN if minimum conditions are not met within 24 hours, the Mode of Applicability would be considered OPERATING (equivalent to ITS MODE 1), HOT STANDBY (equivalent to ITS MODE 2), HOT SHUTDOWN (equivalent to ITS MODE 3), and INTERMEDIATE SHUTDOWN (equivalent to ITS MODE 4). ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Functions 1.a, 2.a, and 3.c state that the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS is MODES 1, 2, 3, and 4. This changes the CTS by explicitly stating the MODES of Applicability for each Functional Unit.

This change is acceptable because the requirements are the same. The ITS explicitly states the MODES of Applicability in ITS Table 3.3.2-1. This change is designated as administrative because it does not result in technical changes to the CTS.

A09 CTS Table 3.5-3 Functional Unit 1.c (Safety Injection – Low Steam Pressure/Line) Column 3 requires 2 channels to be OPERABLE. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 1.e (Safety Injection – Steam Line Pressure-Low) requires three channels per steam line to be OPERABLE. This changes the CTS by identifying the number of required channels on a per steam line basis. Discussion of Change M03 discusses the change in the number of required channels.

This change is acceptable because it results in no technical changes to the Technical Specifications. The CTS Table TS 3.5-3 Functional Unit 1.c description, "Safety Injection – Low Steam Pressure/Line," identifies that the

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number of required OPERABLE channels is on a per steam line basis. This information appears in the ITS in the REQUIRED CHANNELS column of Table 3.3.2-1. This change is designated as administrative because it does not result in technical changes to the CTS.

A10 CTS Table 3.5-4 Functional Unit 2.a (Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection) and Functional Unit 2.b (Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection) Column 1 ("NO. OF CHANNELS") indicates each Function has 2 channels per loop. ITS Table 3.3.2-1 Function 4.d (Steam Line Isolation – High Steam Flow Coincident with Safety Injection and Coincident with T_{avg}-Low Low) and Function 4.e (Steam Line Isolation – High High Steam Flow Coincident with Safety Injection) indicates the number of steam flow REQUIRED CHANNELS to be 2 per steam line for each Function. This changes the CTS by modifying the descriptions in the "NO. OF CHANNELS" column.

This change is acceptable because it results in no technical changes to the Technical Specifications. The CTS Table TS 3.5-4 Functional Units 2.a and 2.b indicate the number of channels on a per loop basis. Two channels of steam flow measurement instrumentation are located on the single steam line exiting the steam generator. Each steam generator is also considered a single loop such that with two steam generators there are two loops. Therefore, the identification of the number of OPERABLE channels on a "per loop" basis or "per steam line" basis is synonymous. This change is designated as administrative because it does not result in technical changes to the CTS.

A11 CTS Table 3.5-4 Functional Unit 4.a (Main Feedwater Isolation – Hi-Hi Steam Generator Level) Column 1 ("NO. OF CHANNELS") indicates there are 3 channels for this Function. ITS Table 3.3.2-1 Function 5.b (Feedwater Isolation – SG Water Level- High High) indicates the number of REQUIRED CHANNELS to be 3 per SG. This changes the CTS by adding a per SG identifier to the "MINIMUM OPERABLE CHANNELS" column.

This change is acceptable because it results in no technical changes to the Technical Specifications. The two KPS steam generators each have three level instrumentation channels coming directly off the steam generator to measure the water level in the generator. Therefore, the addition of the phrase "per SG" more accurately identifies the number of required channels for the Function than what is currently used in the CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A12 CTS 3.3.e.1.A.3 requires the turbine building service water header isolation logic to be OPERABLE as part of the OPERABILITY requirements for the Service Water System. The CTS does not provide any explicit Actions to take when the logic is inoperable. Thus, the actions for the associated Service Water train, CTS 3.3.e.2, would be taken. ITS 3.3.2 ACTION J provides the actions for the Turbine Building Service Water Header Isolation logic. When one or more trains (For Function 7.a) or channels (for Function 7.b) are inoperable, the associated Service Water train must be immediately declared inoperable. This would then require entering the appropriate Conditions and Required Actions of ITS 3.7.8,

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"Service Water System." This changes the CTS by explicitly stating the Required Action and Completion Time for inoperable trains or channels of the Turbine Building Service Water Header Isolation logic.

This change is acceptable since the requirements are not being changed. Both the CTS and ITS require declaring the associated Service Water train inoperable when a train or channel of the Turbine Building Service Water Header Isolation logic. This change is designated as administrative because it does not result in technical changes to the CTS.

A13 CTS Table TS 4.1-1 specifies the applicable testing requirements for the Protective System Logic Channels. Although the CTS does not provide a specific Applicability nor a specific number of Required Channels, all ESFAS Protective System Logic Channels are required to be OPERABLE when any of the associated ESFAS channels are required. ITS Table 3.3.2-1 Functions 1.b, 2.b, 3.b, 4.b, 5.a, and 6.a require two trains of the Automatic Actuation Logic and Actuation Relays to be OPERABLE. ITS Table 3.3.2-1 Functions 1.b, 2.b, and 3.b are required to be OPERABLE in MODES 1, 2, 3, and 4. ITS Table 3.3.2-1 Function 4.b is required to be OPERABLE in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated. ITS Table 3.3.2-1 Function 5.a is required to be OPERABLE in MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve. ITS Table 3.3.2-1 Function 6.a is required to be OPERABLE in MODES 1, 2, and 3. This changes the CTS by explicitly stating the requirements for the Automatic Actuation Logic and Actuation Relays.

This change is acceptable because the requirements are the same. ITS 3.3.2 explicitly states the number of required channels as well as the Applicability requirements in ITS Table 3.3.2-1. Although the CTS does not specify the number of ESFAS Protective System Logic Channel trains that are required to be OPERABLE, both trains are required to support OPERABILITY of the associated ESFAS channels. This change is designated as administrative because it does not result in technical changes to the CTS.

A14 CTS 3.3.e.1.A.3 requires the turbine building service water header isolation logic to be OPERABLE. However, no specific channel description of the logic is provided. ITS Table 3.3.2-1 Function 7 covers this logic. Function 7.a requires two trains of the Automatic Actuation Logic and Actuation Relays to be OPERABLE. Function 7.b requires two channels of the Service Water Pressure – Low to be OPERABLE. This changes the CTS by explicitly stating the logic requirements.

This change is acceptable because the requirements are the same. ITS 3.3.2 explicitly states the required number of channels and trains in ITS Table 3.3.2-1 Functions 7.a and 7.b. Although the CTS does not specify the number of channels and trains that are required to be OPERABLE, all the channels and trains are required for the logic to function properly. The number of trains and

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channels in ITS Table 3.3.2-1 are the total number for the logic. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-2 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-2 Functional Unit 13 (Undervoltage 4-kV), Column 3 requires one Undervoltage 4-kV channel per bus to be OPERABLE. Thus while there are two Undervoltage 4-kV channels per bus in the KPS design, the CTS allows one Undervoltage 4-kV channel per bus to be inoperable for an indefinite period of time; no action required when one Undervoltage 4-kV channel per bus is inoperable. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 6.d requires two Undervoltage Reactor Coolant Pump channels per bus to be OPERABLE. ITS 3.3.2 ACTION H provides compensatory actions to take with one Undervoltage Reactor Coolant Pump channel inoperable and requires placing the channel in trip within 72 hours or to be in MODE 3 within 78 hours. Additionally, a Note has been added to ACTION H which states that the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. This changes the CTS by requiring two Undervoltage Reactor Coolant Pump channels per bus to be OPERABLE instead of one channel per bus and by adding a specific ACTION to take when one less than the required channels is inoperable. See DOC L08 for discussion on the ACTION Note.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Undervoltage Reactor Coolant Pump channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.2-1 will ensure that all of the installed ESFAS channels are required OPERABLE. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M02 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Tables TS 3.5-3 and TS 3.5-4 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-3 Functional Unit 1.a (Safety Injection - Manual), Column 3 requires one Safety Injection - Manual channel to be OPERABLE. Thus while there are two Safety Injection - Manual channels in the KPS design, the CTS allows one Safety Injection - Manual channel to be inoperable for an indefinite period of time; no action required when one Safety Injection - Manual channel is inoperable. Table TS 3.5-4 Functional Unit 1.b (Containment Isolation

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- Manual), Column 3 requires one Containment Isolation - Manual channel to be OPERABLE. Thus while there are two Containment Isolation - Manual channels in the KPS design, the CTS allows one Containment Isolation - Manual channel to be inoperable for an indefinite period of time; no action required when one Containment Isolation - Manual channel is inoperable. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 1.a requires two Safety Injection - Manual Initiation channels to be OPERABLE. ITS Table 3.3.2-1 Function 3.a requires two Containment Isolation - Manual Initiation channels to be OPERABLE. ITS 3.3.2 ACTION B provides compensatory actions to take with one Safety Injection - Manual Initiation channel inoperable or one Containment Isolation – Manual Initiation channel inoperable and requires restoring the channel to OPERABLE status in 48 hours or be in MODE 3 within 54 hours and be in MODE 5 within 84 hours. This changes the CTS by requiring two Safety Injection - Manual channels to be OPERABLE instead of one channel and two Containment Isolation – Manual Initiation channels to be OPERABLE instead of one channel and by adding a specific ACTION to take when one less than the required channels is inoperable.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Safety Injection - Manual Initiation and Containment Isolation – Manual Initiation channels are inoperable. This change is acceptable because the new channel requirements in ITS Table 3.3.2-1 will ensure that all of the installed ESFAS channels are required OPERABLE. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M03 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Tables TS 3.5-3 and TS 3.5-4 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-3 Functional Unit 1.b (Safety Injection – High Containment Pressure) Column 3 requires two Safety Injection – High Containment Pressure channels to be OPERABLE. Thus while there are three Safety Injection - High Containment Pressure channels in the KPS design, the CTS allows one Safety Injection - High Containment Pressure channel to be inoperable for an indefinite period of time; no action required when one Safety Injection - High Containment Pressure channel is inoperable. Table TS 3.5-3 Functional Unit 1.c (Safety Injection – Low Steam Pressure/Line) Column 3 requires two Safety Injection – Low Steam Pressure/Line channels to be OPERABLE. Thus while there are three Safety Injection - Low Steam Pressure/Line channels in the KPS design, the CTS allows one Safety Injection - Low Steam Pressure/Line channel to be inoperable for an indefinite period of time; no action required when one Safety Injection - Low Steam Pressure/Line channel is inoperable. CTS Table TS 3.5-3 Functional Unit 1.d (Safety Injection – Pressurizer Low Pressure) Column 3 requires two Safety Injection – Pressurizer Low Pressure channels to be OPERABLE. Thus while there are

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three Safety Injection - Pressurizer Low Pressure channels in the KPS design, the CTS allows one Safety Injection - Pressurizer Low Pressure channel to be inoperable for an indefinite period of time; no action required when one Safety Injection - Pressurizer Low Pressure channel is inoperable. CTS Table TS 3.5-3 Functional Unit 4.a (Motor-Driven Auxiliary Feedwater Pumps – Either Steam Generator Lo-Lo Level) Column 3 requires two Steam Generator Lo-Lo Level channels per loop to be OPERABLE. Thus while there are three Steam Generator Lo-Lo Level channels per loop in the KPS design, the CTS allows one Steam Generator Lo-Lo Level channel per loop to be inoperable for an indefinite period of time; no action required when one Steam Generator Lo-Lo Level channel per loop is inoperable. CTS Table TS 3.5-3 Functional Unit 5.a (Turbine-Driven Auxiliary Feedwater Pumps – Both Steam Generator Lo-Lo Level) Column 3 requires two Steam Generator Lo-Lo Level channels per loop to be OPERABLE. Thus while there are three Steam Generator Lo-Lo Level channels per loop in the KPS design, the CTS allows one Steam Generator Lo-Lo Level channel per loop to be inoperable for an indefinite period of time; no action required when one Steam Generator Lo-Lo Level channel per loop is inoperable. Table TS 3.5-4 Functional Unit 2.c (Steam Line Isolation – Hi-Hi Containment Pressure) Column 3 requires two Steam Line Isolation – Hi-Hi Containment Pressure channels to be OPERABLE. Thus while there are three Steam Line Isolation – Hi-Hi Containment Pressure channels in the KPS design, the CTS allows one Steam Line Isolation – Hi-Hi Containment Pressure channel to be inoperable for an indefinite period of time; no action required when one Steam Line Isolation – Hi-Hi Containment Pressure channel is inoperable. CTS Table TS 3.5-4 Functional Unit 2.b (Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection) Column 3 requires one Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection channel to be OPERABLE. Thus while there are two Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection channels per loop in the KPS design, the CTS allows one Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection channel per loop to be inoperable for an indefinite period of time; no action required when one Steam Line Isolation – Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety injection channel per loop is inoperable. CTS Table TS 3.5-4 Functional Unit 2.a (Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection) Column 3 requires one Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection channel to be OPERABLE. Thus while there are two Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection channels per loop in the KPS design, the CTS allows one Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection channel per loop to be inoperable for an indefinite period of time; no action required when one Steam Line Isolation – Hi-Hi Steam Flow with Safety Injection channel per loop is inoperable. Table TS 3.5-4 Functional Unit 4.a (Main Feedwater Isolation – Hi-Hi Steam Generator Level) Column 3 requires two Main Feedwater Isolation – Hi-Hi Steam Generator Level channels to be OPERABLE. Thus while there are three Main Feedwater Isolation – Hi-Hi Steam Generator Level channels in the KPS design, the CTS allows one Main Feedwater Isolation – Hi-Hi Steam Generator Level channel to be inoperable for an indefinite period of time; no action required when one Main Feedwater Isolation – Hi-Hi Steam Generator Level channel is inoperable. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 1.c requires three Safety Injection – Containment

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Pressure-High channels to be OPERABLE. ITS Table 3.3.2-1 Function 1.d requires three Safety Injection – Pressurizer Pressure-Low channels to be OPERABLE. ITS Table 3.3.2-1 Function 1.e requires three Safety Injection – Steam Line Pressure-Low channels per steam line to be OPERABLE. ITS Table 3.3.2-1 Function 6.b requires three Auxiliary Feedwater - Steam Generator Water Level-Low Low channels per steam generator to be OPERABLE. ITS Table 3.3.2-1 Function 4.c requires three Steam Line Isolation – Containment Pressure-High High channels to be OPERABLE. ITS Table 3.3.2-1 Function 4.d requires two channels per steam line of the Steam Line Isolation – High Steam Flow and two channels per loop of the Steam Line Isolation - Tavg Low-Low to be OPERABLE. ITS Table 3.3.2-1 Function 4.e requires two channels per steam line of the Steam Line Isolation – High High Steam Flow to be OPERABLE. ITS Table 3.3.2-1 Function 5.b requires three channels per steam generator of the Feedwater Isolation – Steam Generator Water Level-High High to be OPERABLE. ITS 3.3.2 ACTION D provides compensatory actions to take with one Safety Injection – Containment Pressure-High channel inoperable, one Safety Injection – Pressurizer Pressure-Low channel inoperable, one Safety Injection – Steam Line Pressure-Low channel inoperable, one Steam Generator Water Level – Low Low channel per steam generator inoperable, one Steam Line Isolation – Containment Pressure-High High channel inoperable, one Steam Line Isolation – High Steam Flow channel per steam line and one channel per loop of the Steam Line Isolation - Tavg Low-Low inoperable, one Steam Line Isolation – High High Steam Flow channel inoperable, or one Feedwater Isolation – Steam Generator Water Level-High High channel per steam generator inoperable and requires placing the channel in trip in 72 hours or to be in MODE 3 within 78 hours and be in MODE 4 within 84 hours. Additionally, a Note has been added to ACTION D which states that the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. This changes the CTS by requiring additional channels for Safety Injection – Containment Pressure - High, Safety Injection – Low Steam Line Pressure/Line, Safety Injection – Pressurizer Low Pressure, Auxiliary Feedwater – Steam Generator Water Level-Low Low, Steam Line Isolation – Containment Pressure-High High, Steam Line Isolation – High Steam Flow and Tavg Low-Low, Steam Line Isolation – High High Steam Flow, and Feedwater Isolation – Steam Generator Water Level-High High to be OPERABLE and by adding a specific ACTION to take when one less than the required channels is inoperable. See DOC L08 for discussion on the ACTION Note.

The purpose of the new ITS channel requirements and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Safety Injection – High Containment Pressure channels, Safety Injection – Low Steam Line Pressure/Line channels, Safety Injection – Pressurizer Low Pressure channels, Steam Line Isolation – Containment Pressure High High, Steam Line Isolation – High Steam Flow, Steam Line Isolation – Tavg Low Low, Steam Line Isolation – High High Steam Flow, Feedwater Isolation – SG Water Level High High, and Auxiliary Feedwater – Steam Generator Water Level-Low Low channels are inoperable. This change is acceptable because the new channel requirements in ITS Table 3.3.2-1 will ensure that all of the installed ESFAS channels are required OPERABLE. This change is also acceptable because the new Required Actions and Completion Times are used to establish remedial

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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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M04 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-3 Column 3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-3 Functional Unit 3.b (Hi-Hi Containment Pressure (Containment Spray)) Column 3 requires one channel per set to be OPERABLE. Thus while there are three sets of two channels of Hi-Hi Containment Pressure (Containment Spray) in the KPS design, the CTS allows one channel per set of Hi-Hi Containment Pressure (Containment Spray) to be inoperable for an indefinite period of time; no action required when one channel per set of Hi-Hi Containment Pressure (Containment Spray) is inoperable. ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 2.c requires three sets of two channels of Containment Spray – Containment Pressure-High High to be OPERABLE. ITS 3.3.2 ACTION E provides compensatory actions to take with one Containment Pressure channel inoperable and requires placing the channel in trip in 72 hours or to be in MODE 3 within 78 hours and be in MODE 4 within 84 hours. Additionally, a Note has been added to ACTION E which states that one additional channel may be bypassed for up to 12 hours for surveillance testing of other channels. This changes the CTS by requiring three sets of two channels of Containment Spray – Containment Pressure-High High to be OPERABLE instead of one channel per set and by adding a specific ACTION to take when one less than the required channels is inoperable. See DOC L08 for discussion on the ACTION Note.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Containment Spray – Containment Pressure-High High channels are inoperable. This change is acceptable because the new channel requirement in ITS Table 3.3.2-1 will ensure that all of the installed ESFAS channels are required OPERABLE. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M05 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Column 3 of Table TS 3.5-2 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. If the conditions of Column 3 of CTS Table TS 3.5-2 cannot be met (i.e., less than the minimum number of OPERABLE channels), Column 6 requires that the unit be maintained in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Unit 13. Since there is no time limit to attain HOT SHUTDOWN, KPS use the time limit from CTS 3.0.c. CTS 3.0.c requires that within one hour action shall be

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initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY within the next 6 hours and at least in HOT SHUTDOWN within the following 6 hours. In the ITS for Function 6.d, no ACTIONS are provided in ITS 3.3.2 when more than one channel or train is inoperable; therefore, entry into LCO 3.0.3 is required. LCO 3.0.3 requires that the unit be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in MODE 3 within 7 hours, in MODE 4 within 13 hours, and in MODE 5 within 37 hours. The ITS Applicability for Function 6.d is MODES 1 and 2. Therefore, placing the unit in MODE 3 will place the unit in a condition in which the LCO does not apply. This changes the CTS by requiring less time for the unit to reach MODE 3 in the ITS than is allowed to reach MODE 3 in the CTS.

The purpose of Column 6 of CTS Tables TS 3.5-2 is to place the unit in a condition in which the LCO does not apply. 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. Allowing 7 hours to be in MODE 3 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the applicable ESFAS instrumentation to OPERABLE status within the allowed Completion Time. This change is designated as more restrictive because less time is allowed for the unit to reach MODE 3 in the ITS than is allowed to reach MODE 3 in the CTS.

M06 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Column 3 of Table TS 3.5-4 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. If the conditions of Column 3 of CTS Table TS 3.5-4 cannot be met (i.e., less than the minimum number of OPERABLE channels), Column 6 requires that the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 2.a, 2.b, and 2.c of Table TS 3.5-4. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Units 2.a, 2.b, and 2.c of Table TS 3.5-4, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Since there are no time limits to attain HOT SHUTDOWN or COLD SHUTDOWN, KPS uses the times from CTS 3.0.c. CTS 3.0.c requires that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY within the next 6 hours, at least in HOT SHUTDOWN within the following 6 hours, and at least in COLD SHUTDOWN within the subsequent 36 hours. Under similar conditions (i.e., more than one installed channel inoperable) in the ITS for Functions 4.c, 4.d, and 4.e, ITS 3.3.2 provides no ACTIONS; therefore, entry into LCO 3.0.3 is required. LCO 3.0.3 requires that the unit be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in MODE 3 within 7 hours, in MODE 4 within 13 hours, and in MODE 5 within 37 hours. The ITS Applicability for Functions 4.c, 4.d and 4.e is

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MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated. Therefore, placing the unit in MODE 4 will place the unit in a condition in which the LCO does not apply. This changes the CTS by requiring less time for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

The purpose of Column 6 of CTS Table TS 3.5-4 is to place the unit in a condition in which the LCO does not apply. 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. Allowing 13 hours to be in MODE 4 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the applicable ESFAS instrumentation to OPERABLE status within the allowed Completion Time. This change is designated as more restrictive because less time is allowed for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

M07 CTS Table TS 3.5-3 Column 6 specifies the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." CTS Table TS 3.5-3 Column 6 requires maintaining HOT SHUTDOWN for Functional Units 4.a and 5.a. Based on the CTS Table TS 3.5-3 requirement to maintain HOT SHUTDOWN, the Mode of Applicability would be considered OPERATING (equivalent to ITS MODE 1) and HOT STANDBY (equivalent to ITS MODE 2). ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 reflects the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS for Function 6.b as MODES 1, 2, and 3. Commensurate with the change in the Mode of Applicability there is also a change in the MODE that the ACTION requires the plant to be in when channels are inoperable and not restored to OPERABLE status. CTS Table TS 3.5-3 requires the unit be maintained in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required. Since there is no time limit to attain HOT SHUTDOWN, KPS uses the time limit from CTS 3.0.c. CTS 3.0.c requires that within 1 hour action shall be initiated to place the unit in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. ITS LCO 3.3.2 ACTION D requires the unit be placed in MODE 4 to exit the LCO since Function 6.b is required in MODES 1, 2, and 3. The time allowed to place the unit in ITS MODE 4 via ITS 3.0.3 is also 13 hours; however, the time to reach MODE 3 in ITS is 6 hours in lieu of the current 13 hour time in CTS. This changes the CTS by explicitly stating the MODES of Applicability for each Functional Unit and requiring the ESFAS instrumentation Functions be OPERABLE in MODE 3, and changes the time allowed to reach MODE 3.

This change is acceptable because in MODES 1, 2, and 3, the steam generators serve as the heat sink for the reactor. A Steam Generator Water Level – Low Low (ITS Function 6.b) signal will cause both the motor driven and turbine driven auxiliary feedwater pumps to start to provide an immediate flow of water to the steam generator to remove the heat being generated by the reactor. This

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change is designated as more restrictive because the Auxiliary Feedwater - Steam Generator Water Level-Low Low Function is required to be OPERABLE in more MODES in the ITS than in the CTS and less time is allowed to reach MODE 3 in ITS than in CTS.

M08 CTS 3.3.e.1 and CTS 3.3.e.1.A.3 state, in part, that the reactor shall not be made critical unless there is an OPERABLE turbine building service water header isolation logic capable of closing the header isolation valves, except when a turbine building service water header isolation valve is closed and de-activated. In the ITS, this is MODES 1 and 2 except when a turbine building service water header isolation valve is closed and de-activated. ITS Table 3.3.2-1, Functions 7.a and 7.b (Turbine Building Service Water Header Isolation) are required to OPERABLE in MODES 1, 2, and 3 except when a turbine building service water header isolation valve is closed and de-activated. This changes the CTS by requiring the Turbine Building Service Water Header Isolation Function to be OPERABLE in MODE 3.

The SW System, which includes the Turbine Building Service Water Header, is designed to operate under both normal operating conditions and accident conditions. During normal operating conditions, the SW System in conjunction with the Component Cooling (CC) System cools the unit from Residual Heat Removal (RHR) entry conditions to MODE 5. However, the SI signal is only required to be OPERABLE in MODES 1, 2, and 3, so Functions 7.a and 7.b will not include MODE 4. Additionally, the SW System acts as a heat sink for removal of process and operating heat for various safety related and non-safety related components during normal operating conditions. During accident conditions, the Turbine Building Service Water Header is isolated on a safety injection signal coincident with a service water low pressure signal to ensure sufficient service water pressure is available for the containment fan coil units and other safety related components for the removal of decay heat following a design basis loss of coolant accident (LOCA). The addition of the MODE 3 Applicability is acceptable since the SW System is required to be OPERABLE to support both normal operations and to perform its primary post accident function of RCS heat removal if called upon. This change is more restrictive because the ITS adds a new Applicability of MODE 3 that was not required in the CTS.

M09 CTS Table TS 4.1-1 does not provide Surveillance Requirements for testing the Manual Initiation of the Safety Injection, Containment Spray, Containment Isolation, and Steam Line Isolation Functions. ITS SR 3.3.2.5 and ITS Table 3.3.2-1 provide the testing requirements for the Manual Initiation of Functions 1.a (Safety Injection), 2.a (Containment Spray), 3.a (Containment Isolation), and 4.a (Steam Line Isolation). ITS SR 3.3.2.5 is the performance of a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT) every 18 months. The SR contains a Note that states verification of setpoint is not required for manual initiation functions. This changes the CTS by adding new Surveillance Requirements.

This change is acceptable because the added Surveillance Requirements provide a means for verification that the manual initiation of the various ESFAS cooling and isolation functions will perform as expected. This change is

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designated as more restrictive because new Surveillance Requirements are added to the ITS that are not required by the CTS.

M10 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Column 3 of Table TS 3.5-3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. If the conditions of Column 3 of CTS Table TS 3.5-3 cannot be met (i.e., less than the minimum number of OPERABLE channels), Column 6 requires that the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 1.b and 3.b of Table TS 3.5-3. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Unit 1.b of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. In addition, the HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (3) for Functional Unit 3.b of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Since there are no time limits to attain HOT SHUTDOWN or COLD SHUTDOWN, KPS uses the time from CTS 3.0.c. CTS 3.0.c requires that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY within the next 6 hours, at least in HOT SHUTDOWN within the following 6 hours, and at least in COLD SHUTDOWN within the subsequent 36 hours. Under similar conditions (i.e., more than one installed channel inoperable) in the ITS for Functions 1.c and 2.c, ITS 3.3.2 provides no ACTIONS; therefore, entry into LCO 3.0.3 is required. LCO 3.0.3 requires that the unit be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in MODE 3 within 7 hours, in MODE 4 within 13 hours, and in MODE 5 within 37 hours. The ITS Applicability for Functions 1.c and 2.c is MODES 1, 2, and 3. Therefore, placing the unit in MODE 4 will place the unit in a condition in which the LCO does not apply. This changes the CTS by requiring less time for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

The purpose of Column 6 of CTS Table TS 3.5-3 is to place the unit in a condition in which the LCO does not apply. 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. Allowing 13 hours to be in MODE 4 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the applicable ESFAS instrumentation to OPERABLE status within the allowed Completion Time. This change is designated as more restrictive because less time is allowed for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

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M11 CTS Table TS 3.5-4 Column 6 for Functional Unit 1.b requires the unit be in HOT SHUTDOWN as the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." Based on the CTS Table TS 3.5-4 requirement to be in HOT SHUTDOWN, the Mode of Applicability would be OPERATING (equivalent to ITS MODE 1) and HOT STANDBY (equivalent to ITS MODE 2). ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 3.a requires the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS to be MODES 1, 2, 3, and 4. Commensurate with the change in the Mode of Applicability there is also a change in the MODE that the ACTION requires the plant to be placed in when channels are inoperable and not restored to OPERABLE status. CTS Table TS 3.5-4 requires the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required. ITS LCO 3.3.2 ACTION B requires the unit be placed in MODE 5 to exit the LCO since Function 3.a is required in MODES 1, 2, 3, and 4. This changes the CTS Mode of Applicability from MODES 1 and 2 to MODES 1, 2, 3, and 4 and changes the MODE required to exit the LCO from MODE 3 to MODE 5.

This change is acceptable because manual initiation of containment isolation must be OPERABLE in MODES 1, 2, and 3 when there is a potential for an accident to occur and in MODE 4 when adequate time is available to manually actuate required components in the event of an accident. This change is designated as more restrictive because the LCO is applicable in more Modes in the ITS than in the CTS.

M12 CTS Table TS 3.5-4 Column 6 for Functional Units 2.d and 4.a requires the unit be in HOT SHUTDOWN as the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." Based on the CTS Table TS 3.5-4 requirement to be in HOT SHUTDOWN, the Mode of Applicability would be OPERATING (equivalent to ITS MODE 1) and HOT STANDBY (equivalent to ITS MODE 2). ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 4.a requires the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS to be MODE 1 and MODES 2 and 3 except when all MSIVs are closed and de-activated. ITS Table 3.3.2-1 Function 5.b requires the APPLICABLE MODE OR OTHER SPECIFIED CONDITIONS to be MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve. Commensurate with the change in the Mode of Applicability there is also a change in the Mode of Applicability to remove the unit from the LCO. CTS requires the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required. Since no time is specified, KPS uses the time allowed to place the unit in HOT SHUTDOWN (equivalent to ITS MODE 3) via CTS 3.0.c, which is 13 hours. ITS LCO 3.3.2 requires the unit be placed in MODE 4 to exit the LCO since Function 4.a is required in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and de-activated and Function 5.b is required in MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve. The time allowed to place the unit in ITS MODE 4 via ITS 3.0.3 is also 13 hours;

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however, the time to reach MODE 3 in ITS is 7 hours in lieu of the current 13 hour time in CTS. This changes the CTS Mode of Applicability from MODES 1 and 2 to MODE 1 and MODES 2 and 3 except when all MSIVs are closed and de-activated (Function 4.a) and to MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve (Function 5.b), changes the Mode required to exit the LCO from MODE 3 to MODE 4, and changes the time allowed to reach MODE 3.

This change is acceptable because manual initiation of steam line isolation must be OPERABLE in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and de-activated when there is sufficient energy in the reactor coolant system and steam generators to pressurize the containment following a steam line break or other accident. In addition, this change is acceptable because feedwater isolation must be OPERABLE in MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve due to high-high steam generator water level which would cause excessive cooldown of the primary system. This change is designated as more restrictive because the LCO is applicable in more Modes in the ITS than in the CTS and less time is allowed to reach MODE 3 in ITS than in CTS.

M13 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Column 3 of Table TS 3.5-3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. If the conditions of Column 3 of CTS Table TS 3.5-3 cannot be met (i.e., less than the minimum number of OPERABLE channels), Column 6 requires that the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Unit 4.b. Since there is no time limit to attain HOT SHUTDOWN, KPS uses the time limit from CTS 3.0.c. CTS 3.0.c requires that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY within the next 6 hours, at least in HOT SHUTDOWN within the following 6 hours, and at least in COLD SHUTDOWN within the subsequent 36 hours. In the ITS for Function 6.e, no ACTIONS are provided in ITS 3.3.2 when more than one channel or train is inoperable; therefore, entry into LCO 3.0.3 is required. LCO 3.0.3 requires that the unit be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in MODE 3 within 7 hours, in MODE 4 within 13 hours, and in MODE 5 within 37 hours. The ITS Applicability for Function 6.e is MODES 1 and 2. Therefore, placing the unit in MODE 3 will place the unit in a condition in which the LCO does not apply. This changes the CTS by requiring less time for the unit to reach MODE 3 in the ITS than is allowed to reach MODE 3 in the CTS.

The purpose of Column 6 of CTS Tables TS 3.5-3 is to place the unit in a condition in which the LCO does not apply. 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

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a DBA occurring during the allowed Completion Time. Allowing 7 hours to be in MODE 3 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the applicable ESFAS instrumentation to OPERABLE status within the allowed Completion Time. This change is designated as more restrictive because less time is allowed for the unit to reach MODE 3 in the ITS than is allowed to reach MODE 3 in the CTS.

M14 CTS Table TS 4.1-1 does not provide Surveillance Requirements for testing the Auxiliary Feedwater – Undervoltage Reactor Coolant Pump Functions. ITS Table 3.3.2-1 Function 6.d (Auxiliary Feedwater – Undervoltage Reactor Coolant Pump) requires the performance of a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT) (SR 3.3.2.3) every 92 days and the performance of a CHANNEL CALIBRATION (SR 3.3.2.6) every 18 months. ITS SR 3.3.2.3 contains a Note that states verification of relay setpoints is not required. This changes the CTS by adding new Surveillance Requirements.

This change is acceptable because the added Surveillance Requirements provide a means for verification that the ESFAS cooling functions will perform as expected. This change is designated as more restrictive because new Surveillance Requirements are added to the ITS that are not required by the CTS.

M15 ITS Table 3.3.2-1 requires the performance of a CHANNEL CHECK every 12 hours (SR 3.3.2.1), a CHANNEL OPERATIONAL TEST (COT) every 184 days (SR 3.3.2.4), and a CHANNEL CALIBRATION every 18 months (SR 3.3.2.6) for Functions 4.d (Steam Line Isolation – High Steam Flow Coincident with Safety Injection and Coincident with T_{avg}-Low Low) and 4.e (Steam Line Isolation – High High Steam Flow Coincident with Safety Injection). CTS Table TS 4.1-1 does not contain these Surveillance Requirements. This changes the CTS by adding new Surveillance Requirements.

This change is acceptable because the added Surveillance Requirements provide a means for verification that the ESFAS instrumentation will perform as expected. The Frequencies for the proposed tests are consistent with Frequencies for similar instruments; therefore the proposed Frequencies are acceptable. This change is designated as more restrictive because new Surveillance Requirements are added to the ITS that are not required by the CTS.

M16 ITS LCO 3.3.2 requires the ESFAS Instrumentation to be OPERABLE. ITS Table 3.3.2-1, Function 8 (ESFAS Interlock – Reactor Trip (P-4)) requires one channel per train to be OPERABLE in MODES 1, 2, and 3. ITS ACTION F has been added to cover the Condition of when one channel or train is inoperable for Function 8. ITS Required Action F.1 allows 48 hours to restore the required channel or train to OPERABLE status. If this cannot be met, then ITS Required Action F.2.1 requires the unit be in MODE 3 within 54 hours and Required Action F.2.2 requires the unit be in MODE 4 within 60 hours. A Note has been added to the ACTIONS to allow separate Condition entry for each Function. Separate Condition entry is also allowed within a Function for the ESFAS Interlock – Reactor Trip (P-4) on a per train basis. In addition, a TADOT (SR 3.3.2.7) is

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required to be performed prior to closing the reactor trip breaker or reactor trip bypass breaker following each reactor trip breaker cycle. As discussed in the ITS Bases, a reactor trip breaker cycle is defined as when a reactor trip breaker and its associated reactor trip bypass breaker are opened. The TADOT (SR 3.3.2.7) contains a Note that states verification of setpoint is not required. The CTS does not require OPERABLE channels for this Function. This changes the CTS by adding new Functions and applicable ACTIONS and SRs.

This change is acceptable because the ESFAS Interlock – Reactor Trip (P-4) blocks the re-actuation of safety injection after the manual reset of the Safety Injection actuation signal in an effort to avert or reduce the continued cooldown of the Reactor Coolant System following a reactor trip. As such, explicitly including this requirement in the Technical Specifications provides additional assurance that the OPERABILITY of the other ESFAS Instrumentation Functions will be maintained. The change provides explicit requirements for testing the ESFAS Interlock – Reactor Trip (P-4) (Function 8). The addition of a TADOT (SR 3.3.2.7) prior to closing the reactor trip breaker or reactor trip bypass breaker following each reactor trip breaker cycle is acceptable since the proposed Surveillance Requirements are consistent with current practice. The addition of the ACTIONS is acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because it adds explicit OPERABILITY requirements, additional Required Actions and Completion Times, and new Surveillance Requirements to the ITS that were not required in the CTS.

M17 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Column 3 of Table TS 3.5-3 operation shall be limited according to the requirement shown in Column 6 as soon as practicable. If the conditions of Column 3 of CTS Table TS 3.5-3 cannot be met (i.e., less than the minimum number of OPERABLE channels), Column 6 requires that the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 1.c, and 1.d of Table TS 3.5-3. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Unit 1.c and 1.d of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Since there are no time limits to attain HOT SHUTDOWN or COLD SHUTDOWN, KPS uses the time limit from CTS 3.0.c. CTS 3.0.c requires that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY within the next 6 hours, at least in HOT SHUTDOWN within the following 6 hours, and at least in COLD SHUTDOWN within the subsequent 36 hours. Under similar conditions (i.e., more than one installed channel inoperable) in the ITS for Functions 1.d and 1.e, ITS 3.3.2 provides no ACTIONS; therefore, entry into LCO 3.0.3 is required. LCO 3.0.3 requires that the unit be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in MODE 3 within 7 hours, in MODE 4 within 13 hours, and in

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MODE 5 within 37 hours. The ITS Applicability for Functions 1.d and 1.e is MODES 1 and 2 and MODE 3 with pressurizer pressure ≥ 2000 psig. Therefore, placing the unit in MODE 4 will place the unit in a condition in which the LCO does not apply. This changes the CTS by requiring less time for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

The purpose of Column 6 of CTS Table TS 3.5-3 is to place the unit in a condition in which the LCO does not apply. 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. Allowing 13 hours to be in MODE 4 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the applicable ESFAS instrumentation to OPERABLE status within the allowed Completion Time. This change is designated as more restrictive because less time is allowed for the unit to reach MODE 4 in the ITS than is allowed to reach MODE 5 in the CTS.

M18 CTS does not include an ACTUATION LOGIC TEST for the Turbine Building Service Water Header Isolation Logic. ITS Table 3.3.2-1 Function 7.a, Automatic Actuation Logic and Actuation Relays, requires performance of ITS SR 3.3.2.8, which is an ACTUATION LOGIC TEST every 18 months. This changes the CTS by specifying a new Surveillance Requirement.

The purpose of ITS SR 3.3.2.8 is to periodically verify the actuation logic is OPERABLE, with respect to the Turbine Building Service Water Header Isolation logic. This change is acceptable since it will help ensure that the turbine building header is isolated following an accident if the header pressure falls below a predetermined setpoint. This changes is designated as more restrictive because a new Surveillance Requirement is being added to the CTS.

<u>RELOCATED SPECIFICATIONS</u>

None

<u>REMOVED DETAIL CHANGES</u>

LA01 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, USAR, ODCM, NFQAPD, CLRT Program, IST Program, ISI Program, or Setpoint Control Program)* CTS 3.5.a states that Setting Limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. CTS Table TS 3.5-1 contains Setting Limits for Engineered Safety Features initiation instruments. ITS 3.3.2 does not contain Setting Limits for ESFAS initiation instruments. This changes the CTS by moving the Setting Limits for the ESFAS instrumentation to the Setpoint Control Program.

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The removal of these Setting Limit values from the Technical Specifications and the subsequent addition of the methodology that controls changes to the Setting Limit values to ITS 5.5.16 will provide adequate protection of public health and safety. This change is acceptable because the removed information (i.e., the actual setting limits for the RPS Instrumentation) will be located in the Kewaunee Setpoint Control Program. The Kewaunee setpoint methodology provides a means for processing changes to instrumentation setpoints, which is controlled by the Setpoint Control Program contained in ITS 5.5.16. The ITS 5.5.16 Setpoint Control Program identifies the NRC approved setpoint methodology and requires that the Allowable Values, Nominal Trip Setpoints, and As-Found and As-Left Tolerances be calculated using this NRC approved setpoint methodology. Changes to the Kewaunee setpoint methodology are made under 10 CFR 50.59, which ensures that changes are properly evaluated. This change is designated as a less restrictive removal of detail change because Allowable Value/Setpoint Information is being removed from the Technical Specifications and relocated to the Kewaunee Setpoint Control Program.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table TS 3.5-1 Functional Unit 1 (High Containment Pressure (Hi)), Functional Unit 3 (Pressurizer Low Pressure), and Functional Unit 4 (Low Steam Line Pressure) reference footnote (1) which states that Safety Injection "initiates containment isolation, feedwater line isolation, shield building ventilation, auxiliary building special vent, and starting of all containment fans. CTS Table TS 3.5-3 Functional Unit 4.b (Motor-Driven Auxiliary Feedwater Pumps, Loss of Main Feedwater) references footnote (4), which states "Tripping of both main feedwater pump breakers starts both motor-driven auxiliary feedwater pumps." ITS 3.3.2 does not contain these footnotes. This changes the CTS by moving these details to the Bases.

The removal of these details, which relate 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 maintains the requirement to perform a CHANNEL CHECK, TADOT/COT, and CHANNEL CALIBRATION of the ESFAS instrumentation. 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 design is being removed from the Technical Specifications.

LA03 *(Type 3 – Removing Procedural Details for Meeting TS Requirement or Reporting Requirements)* CTS Table TS 3.5-1 Functional Unit 5 (High Steam Flow in a Steam Line Coincident with Safety Injection and "Lo-Lo" T_{avg}) and Functional Unit 6 (High-High Steam Flow in a Steam Line Coincident with Safety Injection) reference footnote (2) which requires confirmation of main steam line isolation valve closure within 5 seconds when tested. ITS 3.3.2 does not contain this footnote. This changes the CTS by moving this procedural detail to the TRM.

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The removal of these details for performing Surveillance 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 maintains the requirement for the number of required channels and the appropriate Condition to enter if a required channel is inoperable. Also, this change is acceptable because the removed requirements will be adequately controlled in the TRM. The TRM is incorporated by reference into the USAR and 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 requirement change because a requirement is being removed from the CTS.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Tables TS 3.5-2, TS 3.5-3, and TS 3.5-4 have four columns stating various requirements for each Functional Unit. These columns are titled "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," "MINIMUM OPERABLE CHANNELS," and "MINIMUM DEGREE OF REDUNDANCY." ITS Table 3.3.2-1 does not contain the "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," and "MINIMUM DEGREE OF REDUNDANCY" columns. This changes the CTS by moving the information provided in the "NO. OF CHANNELS," "NO. OF CHANNELS TO TRIP," and "MINIMUM DEGREE OF REDUNDANCY" columns to the Bases. Note that Discussion of Changes M01 thru M04 describes the changes to the number of channels required by the LCO and Discussion of Change A03 describes the change in the title of the "MINIMUM OPERABLE CHANNELS" column.

The removal of these details, which relate 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 maintains the requirement for the number of required channels (which includes all of the installed channels) and the appropriate Condition to enter if a required channel is inoperable. 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 design is being removed from the Technical Specifications.

LA05 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* Note (a) to Channel Description 18.a (Containment Pressure (SIS signal)) of CTS Table TS 4.1-1 in the Remarks Section states the monthly TEST Surveillance Requirement is applicable only to the Isolation Valve Signal. ITS 3.3.2 requires a similar Surveillance (ITS SR 3.3.2.4) to be performed, but the Surveillance does not contain the information contained in the Note. This changes the CTS by moving the details of the scope of the Surveillance from the CTS to the Bases.

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The removal of these details for performing Surveillance 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 requirement to perform a CHANNEL OPERATIONAL TEST (COT). Also, this change is acceptable because these types of procedural details 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 procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA06 *(Type 4 – Removal of LCO, SR, or other TS Requirement to the TRM, USAR, ODCM, NFQAPD, CLRT Program, IST Program, ISI Program, or Setpoint Control Program)* CTS Table TS 4.1-1 Channel Description 14 provides Surveillance Requirements for Residual Heat Removal Pump Flow instrumentation. The ITS does not include requirements for this flow instrumentation. The Technical Specification function of this instrumentation is only to provide indication. This changes the CTS by relocating the requirements for this flow instrumentation to the TRM.

The removal of requirements for indication only instrumentation 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. These instruments are not required to be OPERABLE to support OPERABILITY of the Technical Specification systems or components. Therefore, this instrumentation is more appropriately specified in the TRM. Therefore, this change is acceptable because the removed requirements will be adequately controlled in the TRM. The TRM is incorporated by reference into the USAR and any changes to the TRM are made under 10 CFR 50.59, which ensures changes are properly evaluated. This change is designated as less restrictive removal of detail change because a Technical Specification Requirement is being removed from the Technical Specifications.

LA07 *(Type 4 – Removal of LCO, SR, or other TS requirement to the TRM, USAR, ODCM, NFQAPD, CLRT Program, IST Program, ISI Program, or Setpoint Control Program)* CTS Table TS 4.1-1 Channel Description 19, Radiation Monitoring System, provides Surveillance Requirements for the instrumentation channels. Included in the REMARKS column of Channel Description 19 is footnote (a) that states, in part, that channels R15 and R19 are included. Specifically, channels R15 and R19 are required to have a performance of a CHANNEL CHECK daily, a CHANNEL CALIBRATION each refueling cycle, and a CHANNEL TEST quarterly. The ITS does not include these requirements for these radiation monitor instrumentation channels. This changes the CTS by moving these requirements to the Offsite Dose Calculation Manual (ODCM).

The removal of these Surveillance Requirements from the Technical Specification is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of

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public health and safety. The function of R15, Condenser Air Ejector Gas Monitor, is to monitor the condenser air ejector discharge flow path on a continuous basis. A high radiation condition initiates closure of the steam generator blowdown sample isolation valves and the steam generator blowdown isolation valves. The function of R19, Steam Generator Blowdown System Liquid Sample Monitor, is to monitor the liquid phase of the secondary side of the steam generator for radiation. A high radiation condition, indicative of a primary to secondary system leak, closes the isolation valves in the blowdown lines and sample lines. The functions of Radiation Monitors R15 and R19 are interconnected, such that either monitor isolates the blowdown and reroutes the air ejector exhaust. These instruments and alarms are not required to be OPERABLE to support the Technical Specification systems or components. Therefore, this instrumentation is more appropriately specified in the ODCM. Therefore, this change is acceptable because the removed requirements will be adequately controlled in the ODCM. Changes made to the ODCM are controlled by the ODCM change control process in ITS 5.5.1, which ensures changes are properly evaluated. This change is designated as less restrictive removal of detail change because a Technical Specification Requirement is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Descriptions 7 (Pressurizer Pressure), 11.a (Steam Generator Low Level), 11.b (Steam Generator High Level), 18.a (Containment Pressure (SIS signal)), 18.b (Containment Pressure (Steamline Isolation)), 18.c (Containment Pressure (Containment Spray Act)), and 23 (Steam Generator Pressure) require a CHANNEL FUNCTIONAL TEST monthly. ITS Table 3.3.2-1 Functions 1.d (Safety Injection – Pressurizer Pressure-Low), 6.b (Auxiliary Feedwater – Steam Generator Water Level-Low Low), 5.b (Feedwater Isolation – Steam Generator Water Level-High High), 1.c (Safety Injection – Containment Pressure-High), 4.c (Steam Line Isolation – Containment Pressure-High), 2.c (Containment Spray – Containment Pressure-High High), and 1.e (Safety Injection – Steam Line Pressure-Low) require performance of a CHANNEL OPERATIONAL TEST (COT) (ITS SR 3.3.2.4) every 184 days. This changes the CTS by changing the Frequency from monthly to 184 days for CTS Table TS 4.4-1 Channel Descriptions 7, 11.a, 11.b, 18.a, 18.b, 18.c, and 23. See Discussion of Change A06 for discussion on changing TEST to COT.

The purpose of the COT is to verify OPERABILITY of all devices in the channel required for channel OPERABILITY. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs).

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Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

L02 *(Category 2 – Relaxation of Applicability)* Column 6 of CTS Table TS 3.5-3 specifies the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." Column 6 requires placing the unit in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 1.b and 3.b of Table TS 3.5-3. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Unit 1.b of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. In addition, the HOT SHUTDOWN requirement in Column 6 of Table TS 3.5-3 contains a footnote, footnote (3) for Functional Unit 3.b, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Based on the footnote 1 and footnote 3 requirements to place the unit in COLD SHUTDOWN, the Mode of Applicability would be OPERATING (equivalent to ITS MODE 1), HOT STANDBY (equivalent to ITS MODE 2), HOT SHUTDOWN (equivalent to ITS MODE 3), and INTERMEDIATE SHUTDOWN (equivalent to ITS MODE 4). ITS LCO 3.3.2 requires the ESFAS instrumentation to be OPERABLE. ITS Table 3.3.2-1 Mode of Applicability for Functions 1.c and 2.c is MODES 1, 2, and 3. Commensurate with the change in the Mode of Applicability for these same Functions, there is also a change in the Mode of Applicability to remove the unit from the LCO. CTS requires the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required and if minimum conditions are not met within 24 hours, steps shall be taken to place the unit in COLD SHUTDOWN (equivalent to ITS MODE 5). ITS LCO 3.3.2 requires the unit be placed in MODE 4 to exit the LCO since Functions 1.c and 2.c are required in MODES 1, 2, and 3. This changes the CTS Mode of Applicability from MODES 1, 2, 3, and 4 to MODES 1, 2, and 3 and changes the Mode required to exit the LCO from MODE 5 to MODE 4. Discussion of Change M10 addresses the change in the time to exit the Mode of Applicability.

This change is acceptable since in MODES 1, 2, and 3 there is sufficient energy in the primary and secondary systems of the plant such that the cooling and isolation Functions of the ESFAS instrumentation are required to be OPERABLE in order to satisfy the assumptions in the accident analyses. In MODES 4, 5, and 6, there is insufficient energy in the Reactor Coolant System or steam generators to experience a steam line break or other accident releasing significant quantities of energy. This change is designated as less restrictive because the LCO is applicable in less Modes in the ITS than in the CTS.

L03 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS 3.5 does not provide any

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explicit Actions to take when the Protective System Logic Channels are inoperable. However, since the ESFAS Protective System Logic Channels support OPERABILITY of the ESFAS trip channels, when one or more of the ESFAS Protective System Logic Channels are inoperable, KPS declares the associated ESFAS trip channels inoperable and takes the appropriate actions required by CTS Table TS 3.5-3 or TS 3.5-4, i.e., maintain HOT SHUTDOWN followed by placing the unit in COLD SHUTDOWN if the channel is not restored within 24 hours. Since there are no time limits to attain HOT SHUTDOWN or COLD SHUTDOWN, KPS uses the times from CTS 3.0.c. CTS 3.0.c requires action to be initiated within 1 hour, to be in HOT STANDBY (equivalent to ITS MODE 2) in the next 6 hours, and to be in HOT SHUTDOWN (equivalent to ITS MODE 3) in the following 6 hours, and to be in COLD SHUTDOWN in the subsequent 36 hours (equivalent to ITS MODE 5). ITS Table 3.3.2-1 Functions 1.b, 2.b, and 3.b (Automatic Actuation Logic and Actuation Relays for Safety Injection, Containment Spray, and Containment Isolation, respectively) require two trains of the Automatic Actuation Logic and Actuation Relays to be OPERABLE in MODES 1, 2, 3, 4 (as discussed in DOC A13). ITS 3.3.2 ACTION C provides the compensatory actions to take when one train of the Automatic Actuation Logic and Actuation Relays for Functions 1.b, 2.b, or 3.b is inoperable, and requires the restoration of the train to OPERABLE status within 24 hours or to be in MODE 3 within 30 hours and be in MODE 5 within 60 hours. Additionally, ACTION C contains a Note which allows the inoperable train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. ITS Table 3.3.2-1 Functions 4.b, 5.a, and 6.a (Automatic Actuation Logic and Actuation Relays for Steam Line Isolation, Feedwater Isolation, and Auxiliary Feedwater, respectively) require two trains of the Automatic Actuation Logic and Actuation Relays to be OPERABLE. The trains are required in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated for Function 4.b, in MODE 1 and MODES 2 and 3 except when all MFIVs, MFRVs, and associated bypass valves are closed and de-activated or isolated by a closed manual valve for Function 5.a, and in MODES 1, 2, and 3 for Function 6.a (as discussed in DOC A13). ITS 3.3.2 ACTION G provides the compensatory actions to take when one train of the Automatic Actuation Logic and Actuation Relays for Functions 4.b, 5.a, or 6.a is inoperable, and requires the restoration of the train to OPERABLE status within 24 hours or to be in MODE 3 within 30 hours and be in MODE 4 within 36 hours. Additionally, ACTION G contains a Note which allows the one train to be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. This changes the CTS by adding specific ACTIONS to take when one train of the Protective System Logic is inoperable. See DOC A13 for Discussion of the Applicability and required trains.

The purpose of the proposed ACTION is to allow some time to restore the inoperable train prior to requiring a unit shutdown. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and

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Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(Category 1 – Relaxation of LCO Requirements)* CTS Table TS 3.5-3 Functional Unit 4.d, Motor-Driven Auxiliary Feedwater (AFW) Pumps 4KV Buses 1-5 and 1-6 undervoltage, requires 1 channel per bus to be OPERABLE. If one of the required channels is inoperable, the unit is required to maintain HOT SHUTDOWN or operate diesel generators. CTS Table TS 3.5-3 Functional Unit 4.d also contains references to footnote (5), which states "Each channel consists of one instantaneous and one time-delay relay connected in series," and footnote (6) which states "When one component of a channel is taken out of service, that component shall be in the tripped condition." ITS 3.3.2 does not include this Function for the Motor-Driven AFW pumps. This changes the CTS by deleting the Motor-Driven Auxiliary Feedwater (AFW) Pumps 4KV Buses 1-5 and 1-6 undervoltage channel requirements and associated footnotes.

The purpose of the Motor-Driven Auxiliary Feedwater (AFW) Pumps 4KV Buses 1-5 and 1-6 undervoltage channels is to inhibit the start of the motor-driven AFW pumps (i.e., closure of the AFW pump motor breaker) until bus 1-5 or 1-6 is energized. When a loss of power to bus 1-5 or 1-6 occurs, the channels open the offsite power supply breakers and send a start signal to the associated DG. These requirements are covered by ITS 3.3.5. The channels also inhibit the start of the motor-driven AFW pumps until power is restored to the associated bus (i.e., from the DG), even if a start signal to the AFW pumps exists. However, the motor-driven AFW pumps are loaded onto the DGs as soon as power is available – they are in the first load block at time zero of the blackout sequence (i.e., the loss of offsite power sequence). If the inhibit fails to function and the motor-driven AFW pump breaker closes when no power is available, when the DG breaker closes and power is restored, the AFW pumps would immediately start on the DG just like they would if the inhibit was functioning properly. Also, ITS 3.8.1 includes a test to verify the load intervals are correct, and it includes both loss of offsite power intervals and safety injection intervals. ITS 3.8.1 also includes a LOOP/ECCS test, which includes verifying loads are sequenced onto the DGs properly. Thus, this test would also detect the motor-driven AFW pumps breakers closing too soon. Therefore, the DG is not negatively impacted by the failure of this inhibit. Furthermore, this signal does not send a start signal to the motor-driven AFW pumps. The only start signals for these pumps comes from a Steam Generator Water Level Low-Low signal (ITS Table 3.3.2-1 Function 6.b), a Safety Injection signal (ITS Table 3.3.2-1 Function 6.c), and a Trip of Both Main Feedwater Pumps signal (ITS Table 3.3.2-1 Function 6.e). Therefore, the deletion of the Motor-Driven Auxiliary Feedwater (AFW) Pumps 4KV Buses 1-5 and 1-6 undervoltage channel requirements is acceptable. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

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L05 *(Category 2 – Relaxation of Applicability)* Column 6 of CTS Table TS 3.5-3 specifies the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." Column 6 requires placing the unit in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 1.c and 1.d of Table TS 3.5-3. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Units 1.c and 1.d of Table TS 3.5-3, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Based on the footnote 1 requirements to place the unit in COLD SHUTDOWN, the Mode of Applicability would be OPERATING (equivalent to ITS MODE 1), HOT STANDBY (equivalent to ITS MODE 2), HOT SHUTDOWN (equivalent to ITS MODE 3), and INTERMEDIATE SHUTDOWN (equivalent to ITS MODE 4). ITS LCO 3.3.2 requires the ESFAS instrumentation to be OPERABLE. ITS Table 3.3.2-1 Mode of Applicability for Functions 1.d and 1.e is MODES 1 and 2, and MODE 3 with pressurizer pressure ≥ 2000 psig. Commensurate with the change in the Mode of Applicability for these same Functions, there is also a change in the Mode of Applicability to remove the unit from the LCO. CTS requires the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required and if minimum conditions are not met within 24 hours, steps shall be taken to place the unit in COLD SHUTDOWN (equivalent to ITS MODE 5). ITS LCO 3.3.2 requires the unit be placed in MODE 4 to exit the LCO since Functions 1.d and 1.e are required in MODES 1 and 2, and MODE 3 with pressurizer pressure ≥ 2000 psig. This changes the CTS Mode of Applicability from MODES 1, 2, 3, and 4 to MODES 1 and 2, and MODE 3 with pressurizer pressure ≥ 2000 psig and changes the Mode required to exit the LCO from MODE 5 to MODE 4. Discussion of Change M17 addresses the change in the time to exit the Mode of Applicability.

This change is acceptable since in MODES 1 and 2, and MODE 3 with pressurizer pressure ≥ 2000 psig there is sufficient energy in the primary and secondary systems of the plant such that the cooling and isolation Functions of the ESFAS instrumentation are required to be OPERABLE in order to satisfy the assumptions in the accident analyses. In MODES 4, 5, and 6, there is insufficient energy in the Reactor Coolant System or steam generators to experience a steam line break or other accident releasing significant quantities of energy. This change is designated as less restrictive because the LCO is applicable in less Modes in the ITS than in the CTS.

L06 *(Category 2 – Relaxation of Applicability)* Column 6 of CTS Table TS 3.5-4 specifies the "OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET." Column 6 requires placing the unit in HOT SHUTDOWN (equivalent to ITS MODE 3) for Functional Units 2.a, 2.b, and 2.c of Table TS 3.5-4. The HOT SHUTDOWN requirement in Column 6 contains a footnote, footnote (1) for Functional Units 2.a, 2.b, and 2.c of Table TS 3.5-4, which states if minimum conditions are not met within 24 hours (i.e., restoration of at least the minimum number of OPERABLE channels required in Column 3), steps shall be taken to place the plant in a COLD SHUTDOWN (equivalent to ITS MODE 5) condition. Based on the footnote 1 requirements to place the unit in COLD

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SHUTDOWN, the Mode of Applicability would be OPERATING (equivalent to ITS MODE 1), HOT STANDBY (equivalent to ITS MODE 2), HOT SHUTDOWN (equivalent to ITS MODE 3), and INTERMEDIATE SHUTDOWN (equivalent to ITS MODE 4). ITS LCO 3.3.2 requires the ESFAS instrumentation to be OPERABLE. ITS Table 3.3.2-1 Mode of Applicability for Functions 4.c, 4.d, and 4.e is MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated. Commensurate with the change in the Mode of Applicability for these same Functions, there is also a change in the Mode of Applicability to remove the unit from the LCO. CTS requires the unit be placed in HOT SHUTDOWN (equivalent to ITS MODE 3) in the event that the minimum number of OPERABLE channels is less than that required and if minimum conditions are not met within 24 hours, steps shall be taken to place the unit in COLD SHUTDOWN (equivalent to ITS MODE 5). ITS LCO 3.3.2 requires the unit be placed in MODE 4 to exit the LCO since Functions 4.c, 4.d, and 4.e are required in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated. This changes the CTS Mode of Applicability from MODES 1, 2, 3, and 4 to MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated and changes the Mode required to exit the LCO from MODE 5 to MODE 4. Discussion of Change M06 addresses the change in the time to exit the Mode of Applicability.

This change is acceptable since in MODE 1 and MODES 2 and 3 except when all MSIVs are closed and deactivated there is sufficient energy in the primary and secondary systems of the plant such that the cooling and isolation Functions of the ESFAS instrumentation are required to be OPERABLE in order to satisfy the assumptions in the accident analyses. In MODES 4, 5, and 6, there is insufficient energy in the Reactor Coolant System or steam generators to experience a steam line break or other accident releasing significant quantities of energy. This change is designated as less restrictive because the LCO is applicable in less Modes in the ITS than in the CTS.

L07 *(Category 4 – Relaxation of Required Action)* CTS Table TS 3.5-3 Column 6 requires the unit be placed in HOT SHUTDOWN for Functional Unit 3.a (Containment Spray – Manual) if the conditions of Column 3 of CTS Table TS 3.5-3 cannot be met (i.e., less than the minimum number of OPERABLE channels). CTS Table TS 3.5-3 Column 6 requires HOT SHUTDOWN be maintained for Functional Unit 4.b (Motor-Driven Auxiliary Feedwater Pumps – Loss of Main Feedwater) if the conditions of Column 3 of CTS Table TS 3.5-3 cannot be met (i.e., less than the minimum number of OPERABLE channels). CTS Table TS 3.5-4 Column 6 requires the unit be placed in HOT SHUTDOWN for Functional Unit 2.d (Steam Line Isolation – Manual) if the conditions of Column 3 of CTS Table TS 3.5-4 cannot be met (i.e., less than the minimum number of OPERABLE channels). ITS LCO 3.3.2 requires the ESFAS instrumentation in Table 3.3.2-1 to be OPERABLE. ITS Table 3.3.2-1 Function 2.a (Containment Spray – Manual Initiation) requires ACTION B be entered if one channel is inoperable. Proposed Required Action B.1 requires the inoperable channel or train be restored to OPERABLE status within 48 prior to requiring a unit shutdown. ITS Table 3.3.2-1 Function 6.e (Auxiliary Feedwater – Trip of both Main Feedwater Pumps) requires ACTION I be entered if one channel per pump is inoperable. Proposed Required Action I.1 requires the

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

inoperable channel be restored to OPERABLE status within 48 hours prior to requiring a unit shutdown. ITS Table 3.3.2-1 Function 4.a (Steam Line Isolation – Manual Initiation) requires ACTION F be entered if one channel is inoperable. Proposed Required Action F.1 requires the inoperable channel or train be restored to OPERABLE status within 48 prior to requiring a unit shutdown. This changes the CTS by allowing 48 hours to restore the inoperable channel or train prior to requiring a unit shutdown.

The purpose of CTS Tables TS 3.5-3 and TS 3.5-4 Column 6 is to provide compensatory measures when the number of OPERABLE channels for each Function is less than the required minimum OPERABLE channels. 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. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L08 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS 3.5.d states, in part, that in the event of subsystem instrumentation channel failure permitted by CTS 3.5.b, then Table TS 3.5-2 does not need to be observed for approximately 4 hours while the operable channels are tested, as long as the failed channel is blocked to prevent an unnecessary reactor trip. ITS 3.3.2 ACTION D, which provides the actions when one channel of the Safety Injection – Containment Pressure – High, Safety Injection – Pressurizer Pressure – Low, Safety Injection – Steam Line Pressure – Low, Steam Line Isolation – Containment Pressure – High High, Steam Line Isolation – High Steam Flow, Steam Line Isolation – High Steam Flow – Coincident with T_{avg} – Low Low, Steam Line Isolation – High High Steam Flow, Feedwater Isolation – SG Water Level High High, or Auxiliary Feedwater – SG Water Level – Low Low Function is inoperable, includes a Note that states the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ITS 3.3.2 ACTION E states, in part, that with one Containment Spray – Containment Pressure – High High channel is inoperable, includes a Note that states one additional channel may be bypassed for up to 12 hours for surveillance testing of other channels. ITS 3.3.2 ACTION H, which provides the actions when one Auxiliary Feedwater – Undervoltage Reactor Coolant Pump channel is inoperable, includes a Note that states the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. This changes the CTS by allowing an inoperable channel to be bypassed 12 hours to perform surveillance testing of other channels instead of the 4 hours allowed in the CTS.

The purpose of CTS 3.5.d is to allow time to perform testing of the operable subsystem channels without entering into the requirements specified in Table TS 3.5-2 through TS 3.5-4. These changes are acceptable and are the result of

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WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the testing of channels than was allowed in the CTS.

L09 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table TS 4.1-1 Channel Description 26 requires a TEST of the Protective System Logic Channel every month. ITS Table 3.3.2-1 Functions 1.b, 2.b, 3.b, 4.b, 5.a, and 6.a (Automatic Actuation Logic and Actuation Relays for Safety Injection, Containment Spray, Containment Isolation, Steam Line Isolation, Feedwater Isolation, and Auxiliary Feedwater, respectively) require performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS. This changes the CTS by requiring the performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS instead of the monthly requirement of CTS.

The purpose of the TEST/ACTUATION LOGIC TEST is to ensure that the instrumentation is functioning properly. These changes are acceptable and are the result of WCAP-10271, Revision 0 ("Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System"), dated May 1996, and supplements, WCAP-14333, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). Dominion Energy Kewaunee has performed evaluations of the applicable changes associated with the three WCAPs to justify the above changes. The evaluations supporting these changes are provided in Attachment 2 of this submittal. This change is designated as less restrictive because less stringent Frequencies are being applied in the ITS than were applied in the CTS.

L10 *(Category 1 – Relaxation of LCO Requirements)* CTS Table TS 3.5-1 Functional Units 1 (High Containment Pressure (Hi)), 3 (Pressurizer Low Pressure), and 4 (Low Steam Line Pressure) contain a Note which states, in part, that the signal overrides any bypass on the accumulator valves. ITS 3.3.2 does not contain this requirement. This changes the CTS by deleting this requirement.

The purpose of this requirement is to ensure that each SI accumulator's isolation valve can be actuated to the correct position to ensure the SI accumulators perform their intended function. This change is acceptable because the deleted requirements are not necessary to ensure the SI accumulators perform their intended function. ITS SR 3.5.1.1 requires verification every 12 hours that each

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

accumulator isolation valve is fully open and ITS SR 3.5.1.5 requires verification every 31 days that motive power is removed from each accumulator isolation valve operator. Removing power from the valve operator essentially defeats the automatic feature required by the CTS Table TS 3.5-1 requirements. Furthermore, since the ITS 3.5.1 Applicability is MODES 1 and 2 and MODE 3 with RCS pressure > 1000 psig, meeting ITS SR 3.5.1.1 and ITS SR 3.5.1.5 prior to entering the Applicability (as required by ITS SR 3.0.4) and during operation in the Applicability (as required by ITS SR 3.0.1) will always ensure that the SI accumulator isolation valves are open with motive power removed from the valve operators anytime the RCS pressure is > 1000 psig. This will preclude the need for the automatic feature. In addition, the ability of the isolation valves to automatically open is not credited in the safety analysis - the analysis assumes the valves are open at the time the accident occurs. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

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

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

3.5.b LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

---NOTE---

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION		COMPLETION TIME
3.5.c	A. One or more Functions with one or more required channels or trains inoperable.	A.1	Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
DOCs M02 and L07	B. One channel or train inoperable.	B.1	Restore channel or train to OPERABLE status.	48 hours
		OR		
		B.2.1	Be in MODE 3.	54 hours
		AND		
		B.2.2	Be in MODE 5.	84 hours

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L03	C. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. ---		1
		C.1 Restore train to OPERABLE status.	24 hours	
		OR		
		C.2.1 Be in MODE 3.	30 hours	
		AND		
		C.2.2 Be in MODE 5.	60 hours	
3.5.d, DOC M03, DOC L08	D. One channel inoperable.	[------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		1
		----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability: One channel may be bypassed for up to 12 hours for surveillance testing. --]		13
		D.1 Place channel in trip.	72 hours	
		OR		

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
		D.2.1 Be in MODE 3. AND D.2.2 Be in MODE 4.	78 hours 84 hours	
3.5.d, DOC M04, DOC L08	E. One Containment Pressure channel inoperable.	[------------------NOTE------------------ One additional channel may be bypassed for up to 12 hours for surveillance testing of other channels. --- ~~----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability.~~ ~~One channel may be bypassed for up to 12 hours for surveillance testing.~~ ~~---]~~ E.1 Place channel in ~~bypass~~ trip. OR E.2.1 Be in MODE 3. AND E.2.2 Be in MODE 4.	 72 hours 78 hours 84 hours	1 13 16
DOCs M16, and L07	F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status. OR F.2.1 Be in MODE 3. AND	48 hours 54 hours	

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	F.2.2 Be in MODE 4.	60 hours
3.5.d, DOC L03 G. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. --	1
	G.1 Restore train to OPERABLE status.	24 hours
	OR	
	G.2.1 Be in MODE 3.	30 hours
	AND	
	G.2.2 Be in MODE 4.	36 hours
H. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. --	6
	H.1 Restore train to OPERABLE status.	24 hours
	OR	
	H.2 Be in MODE 3.	30 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.5.d, DOC M01, DOC L08 H ~~I~~. One channel inoperable.	[------------------NOTE------------------ The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. --- ~~----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability. One channel may be bypassed for up to 12 hours for surveillance testing. ---]~~	3 1 13
	H ~~I~~.1 Place channel in trip.	72 hours
	OR	
	H ~~I~~.2 Be in MODE 3.	78 hours
DOC L07 I ~~J~~. One Main Feedwater Pumps trip channel inoperable.	I ~~J~~.1 Restore channel to OPERABLE status.	48 hours 3
	OR	
	I ~~J~~.2 Be in MODE 3.	54 hours

INSERT 1 4

CTS

4

INSERT 1

DOC A12	J. One or more trains or channels inoperable.	J.1 Declare the associated Service Water (SW) train inoperable.	Immediately

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. One channel inoperable.	[-----------------NOTE------------------ One additional channel may be bypassed for up to [4] hours for surveillance testing. --- ----------REVIEWER'S NOTE---------- The below Note should be used for plants with installed bypass test capability: One channel may be bypassed for up to 12 hours for surveillance testing. ---]	
	K.1 Place channel in bypass.	[6] hours
	OR	
	K.2.1 Be in MODE 3.	[12] hours
	AND	
	K.2.2 Be in MODE 5.	[42] hours
L. One or more channels inoperable.	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	OR	
	L.2.1 Be in MODE 3.	7 hours
	AND	
	L.2.2 Be in MODE 4.	13 hours

6

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All changes are 1 unless otherwise noted

SURVEILLANCE REQUIREMENTS

---NOTE---

4.1.a Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

	SURVEILLANCE		FREQUENCY	
Table TS 4.1-1, Channel Descriptions 7, 11.a, 11.b, 18.a, 18.b, 18.c	SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours	
Table TS 4.1-1, Channel Description 26	SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	92 days on a STAGGERED TEST BASIS	
	SR 3.3.2.3	------------------------------NOTE------------------------------ The continuity check may be excluded. --- Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS	7
	---------REVIEWER'S NOTE--------- The Frequency remains at 31 days on a STAGGERED TEST BASIS for plants with a Relay Protection System. --- SR 3.3.2.4	Perform MASTER RELAY TEST.	92 days on a STAGGERED TEST BASIS	5
Table TS 4.1-1, Channel Descriptions 7, 11.a, 11.b, 18.a, 18.b, 18.c, and 35	SR 3.3.2.5 4	Perform COT in accordance with the Setpoint Control Program.	184 days	5 12
	SR 3.3.2.6	Perform SLAVE RELAY TEST.	[92] days	5
DOC M14	SR 3.3.2.7 3	------------------------------NOTE------------------------------ Verification of relay setpoints not required. --- Perform TADOT.	[92] days	5 1

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All changes are 3 unless otherwise noted

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
DOC M09	SR 3.3.2.~~8~~ 5	------NOTE------ Verification of setpoint not required for manual initiation functions. ------		5
		Perform TADOT.	~~[~~18~~]~~ months	1
Table TS 4.1-1, Channel Descriptions 7, 11.a, 11.b, 18.a, 18.b, and 18.c	SR 3.3.2.~~9~~ 6	~~------NOTE------ This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ------~~		5 9
		Perform CHANNEL CALIBRATION in accordance with the Setpoint Control Program.	~~[~~18~~]~~ months	12 1
	~~SR 3.3.2.10~~	~~------NOTE------ Not required to be performed for the turbine driven AFW pump until [24] hours after SG pressure is ≥ [1000] psig. ------ Verify ESFAS RESPONSE TIMES are within limit.~~	~~[18] months on a STAGGERED TEST BASIS~~	15
DOC M16	SR 3.3.2.~~11~~ 7	------NOTE------ Verification of setpoint not required. ------		5
		Perform TADOT.	Prior to closing the reactor trip breaker or reactor trip bypass breaker following each ~~Once per~~ reactor trip breaker cycle	17
DOC M18	INSERT 1A			4

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3.3.2

4 **INSERT 1A**

DOC M18	SR 3.3.2.8	Perform ACTUATION LOGIC TEST.	18 months

CTS

All changes are 3 unless otherwise noted

ESFAS Instrumentation
3.3.2

Table 3.3.2-1 (page 1 of 8)
Engineered Safety Feature Actuation System Instrumentation

12 10

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT[j]	
Table TS 3.5-3, #1.a; DOC M09	1. Safety Injection							
	a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.8 (5)	NA	NA	5
DOC A13, DOC L03, Table TS 4.1-1, #26	b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 ~~SR 3.3.2.4~~ ~~SR 3.3.2.6~~	NA	NA	5
Tables TS 3.5-1, #1; TS 3.5-3, #1.b; Ts 4.1-1, #18.a	c. Containment Pressure - High 1	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.5 (4) SR 3.3.2.9 (6) ~~SR 3.3.2.10~~	≤ [3.86] psig	[3.6] psig	5, 15
Tables TS 3.5-1, #3; TS 3.5-3 #1.d; TS 4.1-1, #7	d. Pressurizer Pressure - Low	1,2,3[(a)]	[3]	D	SR 3.3.2.1 SR 3.3.2.5 (4) SR 3.3.2.9 (6) ~~SR 3.3.2.10~~	≥ [1839] psig	[1850] psig	1, 5, 15
Tables TS 3.5-1, #4, TS 3.5-3, #1.c; TS 4.1-1, #23	e. Steam Line Pressure (-)							8
	(1) Low	1,2,3[(a)]	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 (4) SR 3.3.2.9 (6) ~~SR 3.3.2.10~~	≥ [635][(b)] psig	[675][(b)] psig	1, 5, 15
	~~(2) High Differential Pressure Between Steam Lines~~	~~1,2,3~~	~~3 per steam line~~	~~D~~	~~[SR 3.3.2.1] SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10~~	~~≤ [106] psig~~	~~[97] psig~~	8

With pressurizer pressure ≥ 2000 psig.

(a) ~~Above the P-11 (Pressurizer Pressure) interlock.~~

~~(b) Time constants used in the lead/lag controller are $t_1 \geq$ [50] seconds and $t_2 \leq$ [5] seconds.~~ 12

~~------------------------------------REVIEWER'S NOTE------------------------------------~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~
~~--~~ 2

CTS

All changes are 3 unless otherwise noted

Table 3.3.2-1 (page 2 of 8)
Engineered Safety Feature Actuation System Instrumentation

12 10

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL[j] TRIP SETPOINT
1. Safety Injection						
f. High Steam Flow in Two Steam Lines	1,2,3 (c)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)	(e)
Coincident with T_{avg} - Low Low	1,2,3 (c)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6]°F	[553]°F
g. High Steam Flow in Two Steam Lines	1,2,3 (c)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)	(e)
Coincident with Steam Line Pressure - Low	1,2,3 (c)	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635](b) psig	[675] psig
2. Containment Spray						
a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.8 5	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA	NA
c. Containment Pressure High - 3 (High High)	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≤ [12.31] psig	[12.05] psig

8

Table TS 3.5-3, #3.a; DOC M09

12 5 10 5

DOC A13, DOC L03, Table TS 4.1-1, #26

8

(c) Above the P-12 (T_{avg} - Low Low) interlock. 8

(d) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, and ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.

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(e) Less than or equal to a function defined as ΔP corresponding to [40]% full steam flow between [0]% and [20]% load and then a ΔP increasing linearly from [40]% steam flow at [20]% load to [110]% full steam flow at [100]% load.

-----REVIEWER'S NOTE-----

(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit. 2

CTS

All changes are 3 unless otherwise noted

Table 3.3.2-1 (page 3 of 8)
Engineered Safety Feature Actuation System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE 12	NOMINAL TRIP SETPOINT[(j)] 10	
	2. Containment Spray							
Tables TS 3.5-1, #2.a; TS 3.5-3, #3.b	c. ~~d.~~ Containment Pressure High - High ~~3 (Two Loop Plants)~~	1,2,3	~~[3]~~ sets of ~~[2]~~	E	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≤ [12.31] psig	[12.05] psig	8 1 5 15
	3. Containment Isolation							
	~~a. Phase A Isolation~~							
Table TS 3.5-4, #1.b; DOC M09	a. ~~(1)~~ Manual Initiation	1,2,3,4	2	B	SR 3.3.2.~~8~~ 5	NA	NA	8 5
DOC A13, DOC L03, Table TS 4.1-1, #26	b. ~~(2)~~ Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 ~~SR 3.3.2.4~~ ~~SR 3.3.2.6~~	NA	NA	8 5
Tables TS 3.5-3, #1; TS 3.5-4, #1.a	c. ~~(3)~~ Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						8
	~~b. Phase B Isolation~~							
	~~(1) Manual Initiation~~	~~1,2,3,4~~	~~2 per train, 2 trains~~	~~B~~	~~SR 3.3.2.8~~	~~NA~~	~~NA~~	
	~~(2) Automatic Actuation Logic and Actuation Relays~~	~~1,2,3,4~~	~~2 trains~~	~~C~~	~~SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6~~	~~NA~~	~~NA~~	8
	~~(3) Containment Pressure High - 3 (High High)~~	~~1,2,3~~	~~[4]~~	~~E~~	~~SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10~~	~~≤ [12.31] psig~~	~~[12.05] psig~~	

~~-----REVIEWER'S NOTE-----~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~
~~----------~~ 2

CTS

All changes are 3 unless otherwise noted

ESFAS Instrumentation
3.3.2

Table 3.3.2-1 (page 4 of 8)
Engineered Safety Feature Actuation System Instrumentation

12 10

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL[j] TRIP SETPOINT	
	4. Steam Line Isolation	(b)						
Table TS 3.5-4, #2.d; DOC M09	a. Manual Initiation	1,2 ~~(h)~~,3 ~~(h)~~	2	F	SR 3.3.2.~~8~~ 5	~~NA~~	~~NA~~	5
DOC A13, DOC L03, Table TS 4.1-1, #26	b. Automatic Actuation Logic and Actuation Relays	1,2 ~~(h)~~,3 ~~(h)~~ (b)	2 trains	G	SR 3.3.2.2 ~~SR 3.3.2.4~~ ~~SR 3.3.2.6~~	~~NA~~	~~NA~~	5
Tables TS 3.5-1, #2.b; TS 3.5-4, #2.c; TS 4.1-1, #18.b	c. Containment Pressure - High ~~2~~ High	1, 2 ~~(h)~~, 3 ~~(h)~~ (b)	~~[4]~~ 3	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	~~≤ [6.61] psig~~	~~[6.35] psig~~	1 5 15
	~~d. Steam Line Pressure~~							
	~~(1) Low~~	~~1, 2 (h), 3 (a) (h)~~	~~3 per steam line~~	~~D~~	~~SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10~~	~~≥ [635](b) psig~~	~~[675](b) psig~~	8
	~~(2) Negative Rate - High~~	~~3 (f) (h)~~	~~3 per steam line~~	~~D~~	~~SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10~~	~~≤ [121.6](g) psi~~	~~[110](g) psi~~	

~~(a) Above the P-11 (Pressurizer Pressure) interlock.~~

~~(b) Time constants used in the lead/lag controller are $t_1 \geq$ [50] seconds and $t_2 \leq$ [5] seconds.~~

~~(f) Below the P-11 (Pressurizer Pressure) interlock.~~

~~(g) Time constant utilized in the rate/lag controller is ≥ [50] seconds.~~

8

(~~h~~ b) Except when all MSIVs are closed and ~~[de-activated]~~. 8 1

~~-----REVIEWER'S NOTE-----~~

~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 2

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All changes are 3 unless otherwise noted

Table 3.3.2-1 (page 5 of 8)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (12)	NOMINAL TRIP SETPOINT[(j)] (10)
	4. Steam Line Isolation						
	e. High Steam Flow in Two Steam Lines	1, 2 [(h)], 3 [(h)]	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)	(e)
	Coincident with T_{avg} - Low Low	1, 2 [(h)], 3 [(c) (h)]	1 per loop	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [550.6]°F	[553]°F
	f. High Steam Flow in Two Steam Lines	1, 2 [(h)], 3 [(h)]	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	(d)	(e)
	Coincident with Steam Line Pressure - Low	1,2,[(h)] 3 [(h)]	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [635][(b)] psig	[675][(b)] psig
Table TS 3.5-4, #2.b; DOC M15	d. ~~g.~~ High Steam Flow	1,2 ~~(h)~~ (b), 3 ~~(h)~~ (b)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≤ [25]% of full steam flow at no load steam pressure (12)	[ ] full steam flow at no load steam pressure (10)
Table TS 3.5-1, #5	Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
	and						
Table TS 3.5-1, #5	Coincident with T_{avg} - Low Low	1,2 ~~(h)~~ (b), 3 ~~(c)~~ ~~(h)~~ (c)	~~[2]~~ per loop	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~ (12)	~~[553]°F~~ (10)

8 1 5 15

(b) Time constants used in the lead/lag controller are t_1 ≥ [50] seconds and t_2 ≤ [5] seconds. 8

(c) Above the ~~P-12 (T_{avg} - Low Low) interlock.~~ Reactor Coolant System (RCS) Tavg ≥ 540 °F.

~~(d) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.~~ 12

~~(e) Less than or equal to a function defined as ΔP corresponding to [40]% full steam flow between [0]% and [20]% load and then a ΔP increasing linearly from [40]% steam flow at [20]% load to [110]% full steam flow at [100]% load.~~

~~(h)~~ (b) Except when all MSIVs are closed and ~~[de-activated]~~. 8 1

~~-----REVIEWER'S NOTE-----~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 2

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All changes are 3 unless otherwise noted

ESFAS Instrumentation
3.3.2

Table 3.3.2-1 (page 6 of 8)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (12)	NOMINAL TRIP SETPOINT[(j)] (10)	
	4. Steam Line Isolation							
Table TS 3.5-4, #2.a; DOC M15	e. ~~h.~~ High High Steam Flow	1,2[(h)](b),3[(h)]	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≤ [130]% of full steam flow at full load steam pressure	[ ] of full steam flow at full load steam pressure	8 5 15
Table TS 3.5-1, #6	Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						
	5. ~~Turbine Trip and~~ Feedwater Isolation					(12)	(10)	
DOC A13, DOC L03, Table TS 4.1-1, #26	a. Automatic Actuation Logic and Actuation Relays	1, 2[(i)](d), [3][(i)]	2 trains	[H]G[ ]	SR 3.3.2.2 ~~SR 3.3.2.4~~ ~~SR 3.3.2.6~~	NA	NA	1 5
Table TS 3.5-4, #4.a	b. SG Water Level - High High ~~(P-14)~~	1,2[(i)](d), [3][(i)]	[3] per SG	[ ]D[ ]	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≤ [84.2]%	[82.4]%	1 5 15
Table TS 4.1-1, #11.b	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						
	6. Auxiliary Feedwater							
	~~a. Automatic Actuation Logic and Actuation Relays (Solid State Protection System)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6~~	~~NA~~	~~NA~~	8
DOC M16	a. ~~b.~~ Automatic Actuation Logic and Actuation Relays ~~(Balance of Plant ESFAS)~~	1,2,3	2 trains	G	SR 3.3.2.~~3~~ 2	~~NA~~	~~NA~~	8 7 10 12

(b) ~~(h)~~ Except when all MSIVs are closed and [de-activated]. 8 1

(d) ~~(i)~~ Except when all MFIVs, MFRVs, [and associated bypass valves] are closed and [de-activated] [or isolated by a closed manual valve]. 8 1

~~-----REVIEWER'S NOTE-----~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 2

CTS

All changes are 3 unless otherwise noted

Table 3.3.2-1 (page 7 of 8)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE (12)	NOMINAL[(j)] TRIP SETPOINT (10)	
	6. Auxiliary Feedwater							
Tables TS 3.5-3, #4.a and #5.a; TS 4.1-1, #11.a	b. ~~c.~~ SG Water Level - Low Low	1,2,3	[3] per SG	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≥ [30.4]%	[32.2]%	8 1 5 15
Table TS 3.5-3, #4.c	c. ~~d.~~ Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						8
	e. Loss of Offsite Power	1,2,3	3] per bus	F	SR 3.3.2.7 SR 3.3.2.9 SR 3.3.2.10	≥ [2912] V with ≤ 0.8 sec time delay	[2975] V with ≤ 0.8 sec time delay	8 10
Tables TS 3.5-2, #13; TS 3.5-3, #5.b; DOC M14	d. ~~f.~~ Undervoltage Reactor Coolant Pump	1,2	[3] per bus 2	~~I~~ H	SR 3.3.2.~~7~~ 3 SR 3.3.2.~~9~~ 6 ~~SR 3.3.2.10~~	≥ [69]% bus voltage	[70]% bus voltage	8 1 5 15
DOC M13; Tables TS 3.5-3, #4.b; TS 4.1-1, #35	e. ~~g.~~ Trip of ~~all~~ both Main Feedwater Pumps	1,2	1 [2] per pump	~~J~~ I	SR 3.3.2.~~8~~ 5 ~~SR 3.3.2.9~~ ~~SR 3.3.2.10~~	≥ [ ] psig	[ ] psig	8 1 5 14 15 12
	h. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	[2]	F	SR 3.3.2.1 SR 3.3.2.7 SR 3.3.2.9	≥ [20.53] [psia]	[ ] [psia]	8
	7. Automatic Switchover to Containment Sump	INSERT 2						4
	a. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA	NA	
	b. Refueling Water Storage Tank (RWST) Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [15]% and ≤ [ ]%	[ ]% and [ ]%	8
	Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						

---REVIEWER'S NOTE---

(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.

--- 2

INSERT 3 4

CTS 3.3.2

4 **INSERT 2**

7. Turbine Building Service Water Header Isolation

3.3.e.1, 3.3.e.1.A.3, DOC M18	a.	Automatic Actuation Logic and Actuation Relays	$1^{(e)},2^{(e)},3^{(e)}$	2 trains	J	SR 3.3.2.8
Table TS 4.1-1 #45, 3.3.e.1, 3.3.e.1.A.3	b.	Service Water Pressure - Low	$1^{(e)},2^{(e)},3^{(e)}$	2	J	SR 3.3.2.4 SR 3.3.2.6
		Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			

4 **INSERT 3**

3.3.e.1.A.3 (e) Except when one turbine building service water header isolation valve is closed and de-activated.

CTS

All changes are 3 unless otherwise noted

ESFAS Instrumentation
3.3.2

Table 3.3.2-1 (page 8 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE 12	NOMINAL[(j)] TRIP SETPOINT 10
7. Automatic Switchover to Containment Sump						
c. RWST Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [15]%	[18]%
Coincident with Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
and						
Coincident with Containment Sump Level - High	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [30] in. above el. [703] ft	[ ] in. above el. [ ]ft
8. ESFAS Interlocks -						
~~a.~~ Reactor Trip, P-4	1,2,3	1 per train, ~~2 trains~~ 7	F	SR 3.3.2.~~11~~ 7	~~NA~~ 12	~~NA~~ 10
b. Pressurizer Pressure, P-11	1,2,3	3	L	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤ [1996] psig	[ ] psig
c. T_{avg} - Low Low, P-12	1,2,3	[1] per loop	L	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≥ [550.6]°F	[553]° F

DOC M16

8

5 8 11

8

-----REVIEWER'S NOTE-----
(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.

2

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

1. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

2. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

3. 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. Where a deletion has occurred, subsequent alpha-numeric designators have been changed for any applicable affected ACTIONS, SURVEILLANCE REQUIREMENTS and FUNCTIONS.

4. An additional Function, Function 7, Turbine Building Service Water Header Isolation, has been added to the ESFAS Instrumentation Specification to be consistent with the current licensing basis (CTS 3.3.e). The Surveillance Requirement included for the Automatic Actuation Logic and Actuation Relays (Function 7.a) is an ACTUATION LOGIC TEST (SR 3.3.2.8). Surveillance Requirements included for the Service Water Pressure – Low (Function 7.b) are a CHANNEL OPERATIONAL TEST (SR 3.3.2.4) and a CHANNEL CALIBRATION (SR 3.3.2.6). In addition, ACTION J has been added to provide compensatory measure to be taken when there are less than the number of required channels OPERABLE. This function provides automatic isolation of the non-safety (Turbine Building) service water header by closing the open Turbine Building Header isolation valve on receipt of a coincident low service water header pressure signal and a SI signal. This provides a means of isolating non-safety related cooling loads from the safety related cooling loads following an accident to assure adequate cooling is available to the safety related equipment.

5. The ISTS contains a Surveillance Requirement (SR) for a MASTER RELAY TEST every 92 days on a STAGGERED TEST BASIS (ITS SR 3.3.2.4) and an SR for a SLAVE RELAY TEST every 92 days (ISTS SR 3.3.2.6). These Surveillance Requirements are not included in the KPS ITS.

   This is acceptable because in response to Generic Letter 96-01 “Testing of Safety-Related Logic Circuits” KPS verified that the appropriate relays, contacts, and wiring runs were being tested for “overlap”. The results of this effort were changes and enhancements to KPS procedures to ensure every aspect of the Safety Related Logic Circuits were being tested. The Master and Slave relays that can be checked online without affecting safety and reliability are checked during the Actuation Logic Test (ALT). The remaining portions of the circuits that cannot be checked during the Actuation Logic Test are checked by various other procedures when plant conditions allow for the safe and reliable testing of these portions. All of this was documented in the KPS response to Generic Letter 96-01.

   KPS design does not allow for monthly or quarterly testing of the Master Relays and Slave Relays in a separate test. Kewaunee design does not include special test circuitry that would allow convenient testing of all relays. To successfully test

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ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

all of the master and slave relays, very intrusive test setups would be required that in and of themselves would jeopardize the safety of the maintenance personnel (installing temporary jumpers in energized cabinets) and could jeopardize the safety and reliability of the nuclear plant (inadvertent initiation of containment spray or safety injection, etc..).

ESFAS relay logic test circuit design for Westinghouse 2-loop plants of KPS vintage generally consists of input relays, latching relays (master), non-latching relays (slave) and test relays. When ESF is placed in test for Actuation Logic Testing (ALT), the test relay contacts block energizing of any master or slave relays whose contacts are connected to external equipment actuation circuits for the entire train. This precludes inadvertent initiation of SI or Containment Spray etc. All master and slave relays whose contacts remain within the logic are allowed to energize as each input relay matrix is made up. The relays that are allowed to energize or those blocked is unique to each logic function, based on circuit design. There is a continuity check feature for each master or slave relay coil circuit that is blocked when in test.

In a letter from Wisconsin Public Service to the NRC dated April 19, 1996 in response to Generic Letter 96-01 and subsequently accepted in a letter from the NRC dated January 14, 1999, WPSC states and the NRC accepts that:

> "The Kewaunee Nuclear Power Plant began construction in the late 1960's and received its operating license in 1973. As such the design does not include the same capabilities for testing as the more recently licensed plants. The limitations in the testing capability were recognized and acknowledged during original plant licensing and during development of the plant technical specifications. The original plant NRC safety evaluation report (Reference 4) reviewed and accepted the design and periodic testing practices for the ESF logic circuits." An excerpt from that evaluation report is repeated below:
>
> > "…test capability of the ESF logic circuitry beyond the master relays with the plant at power is limited. Testing of the logic master relay must be accomplished by blocking the slave relays which normally actuate the engineered safety features. Periodic testing of the slave relays and actuated relays will be limited to checking relay coil resistance and actuated device circuitry for continuity. This design does not meet the recently approved safety guide criterion on the subject. However, we consider that backfitting the system would not provide substantial additional protection to the public health and safety and, hence, is not warranted. The applicant's capability to test, as described, is consistent with designs recently approved for operating licenses. We have concluded that the testing capability for the Kewaunee plant is acceptable."

WPSC has concluded that this testing meets the technical specification requirements, and, in response to question 23 of enclosure 3 to the acceptance letter from the NRC to WPSC in response to letters concerning Generic Letter 96-01, dated January 14, 1999, the NRC concluded that previously accepted testing practices would continue to remain acceptable."

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

Therefore, all master and slave relays in ESF that can be safely checked online and do not pose a significant risk to plant reliability are checked during the performance of the Actuation Logic Test (ALT). The remainder of the Master and Slave Relays are checked by actual equipment operation when the plant conditions are such that it does not significantly affect safety and reliability in the plant. KPS currently tests and meets the requirements of Generic Letter 96-01 and the inclusion of specific Master or Slave Relay Testing would be intrusive and/or affect safety and reliability due to the design of KPS. This was acknowledged in the original plant NRC SER (Ref. 1), a letter from WPSC to the NRC dated April 19, 1996 in regard to Generic Letter 96-01 (Ref. 2), and the acceptance letter from the NRC to WPSC dated January 14, 1999 in regard to Generic Letter 96-01 (Ref. 3). KPS testing of the Master and Slave Relays is limited and plant design does not allow for safely and reliably performing separate Master and Slave Relay Testing surveillances. Due to these deletions, the subsequent Surveillance Requirements have been renumbered and reordered, as necessary.

6. ISTS 3.3.2 ACTIONS H, K, and L are applicable to ISTS Table 3.3.2-1 Functions 5.a, 7.b, 7.c, 8.b, and 8.c. These Functions are not applicable to the design of KPS; therefore, the applicable ACTIONS have been deleted. The discussion for the reason each function is not applicable to KPS is found in other Justification For Deviations.

7. ISTS SR 3.3.2.3 requires the performance of an ACTUATION LOGIC TEST every 31 days on a STAGGERED TEST BASIS. ISTS SR 3.3.2.3 also contains a NOTE that the continuity check may be excluded. ISTS SR 3.3.2.3 is applicable only to ISTS Table 3.3.2-1 Function 6.b, Auxiliary Feedwater Automatic Actuation Logic and Actuation Relays. This test is currently not required at KPS. Since the design of the KPS ESFAS actuation logic is such that master and slave relays are employed and not a solid state protection system, ISTS SR 3.3.2.2 (ITS SR 3.3.2.2) is used to check the Auxiliary Feedwater Automatic Actuation Logic and Actuation Relays. ISTS SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS. ISTS SR 3.3.2.2 does not contain the NOTE that the continuity check may be excluded. This testing Frequency is considered acceptable and is the same Frequency as relay testing for other ESFAS Functions. In addition, the Note is not needed for ITS SR 3.3.2.2. Subsequent Surveillance Requirements have been renumbered, as necessary.

8. ISTS Table 3.3.2-1 Functions 1.e.2 (Steam Line Pressure – High Differential Pressure Between Steam Lines), 1.f (High Steam Flow in Two Steam Lines Coincident with T_{avg} – Low Low), 1.g (High Steam Flow in Two Steam Lines Coincident with Steam Line Pressure - Low), 2.c (Containment Pressure High – 3 (High High)), 3.b.(1) (Phase B Isolation – Manual Initiation), 3.b.(2) (Phase B Isolation – Automatic Actuation Logic and Actuation Relays), 3.b.(3) (Containment Pressure High – 3 (High High)), 4.d.(1), (Steam Line Pressure Low), 4.d.(2), (Negative Rate - High), 4.e, (High Steam Flow in Two Steam Lines Coincident with T_{avg} – Low Low), 4.f, (High Steam Flow in Two Steam Lines Coincident with Steam Line Pressure - Low), 6.a, (Automatic Actuation Logic and Actuation Relays (Solid State Protection System)), 6.e, (Auxiliary Feedwater Loss of Offsite Power), 6.h, (Auxiliary Feedwater Pump Suction transfer on Suction Pressure – Low), all

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

Functions associated with Function 7 (Automatic Switchover to Containment Sump), 8.b, (Pressurizer Pressure, P-11), and 8.c, (T_{avg} – Low Low, P-12) have been deleted since they do not apply to the KPS design. In addition, all applicable footnotes related to those Functions are also being deleted. Subsequent Functions and footnotes have been renumbered as applicable.

9. A Note to ISTS SR 3.3.2.9 (ITS SR 3.3.2.6) requires the CHANNEL CALIBRATION to include verification that time constants are adjusted to the prescribed values. In the KPS ITS, this Surveillance (ITS SR 3.3.2.6) applies to ITS Table 3.3.2-1, Functions 1.c, 1.d, 1.e, 2.c, 4.c, 4.d, 4.e, 5.b, 6.b, 6.d, and 7.b. Of these Functions, the only one that has a time constant is ITS Table 3.3.2-1 Functions 1.e, and the time constants are included in a Note to the Allowable Value. Thus, the time constant is part of the Allowable Value for this function. The definition of CHANNEL CALIBRATION states that it is the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. Thus the CHANNEL CALIBRATION of this Function requires the time constant be set properly. It is not necessary to include a Note that also says that the CHANNEL CALIBRATION Surveillance includes the time constants; it already does. Including this note in this Surveillance would incorrectly imply that a CHANNEL CALIBRATION does not require certain Allowable Values (i.e., time constant type Allowable Values) to be verified during the CHANNEL CALIBRATION. In addition, the Allowable Values for the KPS ITS will be removed from the ITS and retained in a licensee-controlled Setpoint Control Program. Therefore, the Note is not included in the KPS ITS.

10. The Nominal Trip Setpoint column has been deleted as allowed by the Reviewer's Note at the end of the ISTS Table 3.3.2-1. This Reviewer's Note allows specific unit implementation to contain only the Allowable Value. The nominal trip setpoints for each of the applicable ITS Table 3.3.2-1 Functions will be controlled in accordance with the Note in the ISTS 3.3.2 Bases Background section.

11. ISTS Table 3.3.2-1 (ITS Table 3.3.2-1) Function 8 (Reactor Trip, P-4 Interlock) has been revised by deleting the term "2 trains." This information is Bases type information and has been included in the ITS Bases.

12. Changes are made to the ISTS that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. KPS has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this adoption strategy, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications. Hence the deletion of the "ALLOWABLE VALUE" and "NOMINAL TRIP SETPOINT" columns from Table 3.3.2-1 of the ITS. Included in the relocation to the licensee-controlled Setpoint Control Program is all information contained within any associated footnotes that tie to numerical values in the Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Value columns. In addition, the adoption strategy requires that each instrument surveillance

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

requirement which verifies a LSSS (both SL and non-SL-LSSSs) contain a requirement to perform the surveillance test in accordance with the SCP. Hence, the addition of the phrase "in accordance with the Setpoint Control Program" to ITS SR 3.3.2.4, CHANNEL OPERATIONAL TEST (COT) and ITS SR 3.3.2.6, CHANNEL CALIBRATION in the surveillance requirement table.

13. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. ISTS Required Actions D, E, and I (ITS Required Actions D, E, and H, respectively) are modified by a Note that provides two options for bypassing a channel for up to 12 hours for the purpose of performing surveillance testing without entry into the applicable Required Actions. One option is for plants that have installed bypass testing capabilities. The other option is for plants that do not have installed bypass testing capabilities. KPS does not have installed bypass testing capabilities. Therefore, the Note for plants that do not have bypass testing capabilities is retained for Required Actions D, E, and H.

14. ISTS Table 3.3.2-1 Function 6.g (Trip of all Main Feedwater Pumps) specifies that ISTS SR 3.3.2.9, a CHANNEL CALIBRATION, is required for the Function. This CHANNEL CALIBRATION requirement is not being included in the KPS ITS for the same Function (ITS Table 3.3.2-1 Function 6.e). The ISTS shows that the Function has an ALLOWABLE VALUE and NOMINAL TRIP SETPOINT based on a pressure. The ISTS Bases describes that the trip is derived from low pressure on the control air/oil line of the turbine driven main feedwater pumps. Thus, it is appropriate to perform a CHANNEL CALIBRATION on the sensors. However, KPS uses motor driven main feedwater pumps, and the signal to start the AFW pumps comes from the breaker position contacts. Thus, there is no CHANNEL CALIBRATION to perform. This is also consistent with the KPS CTS, which does not require a CHANNEL CALIBRATION.

15. The ESFAS RESPONSE TIME requirement, ISTS SR 3.3.2.10, has not been adopted into the KPS ITS, consistent with Kewaunee current licensing basis and current Technical Specifications. The Kewaunee USAR describes the implementation of the principles as related to the proposed IEEE-279 "Standard, Nuclear Power Plant Protection Systems," August 1968. This industry standard provides guidance and requirements for conducting periodic testing of protection systems. IEEE-279-1968 does not address response time testing. Furthermore, generic studies have shown that instrumentation response time changes (increasing times), that could impact safety, do not normally vary such that they would not be detected during other required surveillances (e.g., CHANNEL CALIBRATIONS). Since the addition of these tests would be a major burden (plant design does not readily lend itself to such testing) with little gain in safety, ISTS SR 3.3.2.10 has not been added.

16. Throughout the ISTS, in both the Specifications and the Bases, reference is made to placing a channel in bypass or bypassing an inoperable channel. KPS does not have the ability to place a channel in bypass or perform a bypass of an inoperable channel without performing a temporary alteration of the circuit. Since the installation of temporary alterations is intrusive, KPS has determined that this practice is unacceptable. Therefore, KPS does not have the ability to place a channel in bypass or perform a bypass of an inoperable channel. As a result,

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

when a channel is required to be placed in bypass or a bypass of a channel is required, the channel is placed in the trip condition.

17. ISTS SR 3.3.2.11 requires that a TADOT be performed on ISTS Table 3.3.2-1 Function 8.a, P-4 Interlock, once per RTB cycle. However, the Surveillance Frequency does not specify how soon following the RTB cycle the SR is to be performed. Furthermore, it does not define specifically what an RTB cycle is. The Frequency for ISTS SR 3.3.2.11 (ITS SR 3.3.2.7) has been modified to require the SR to be performed "Prior to closing the reactor trip breaker or reactor trip bypass breaker following each RTB cycle." This ensures that when an RTB cycle occurs, the P-4 interlock is tested before the associated breakers are re-closed. Furthermore, the Bases have been revised to define a reactor trip breaker cycle as when a reactor trip breaker and its associated reactor trip bypass breaker are opened. This ensures that, following a reactor trip or shutdown, the TADOT is performed on the associated P-4 interlock before closing either of the associated breakers.

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

B 3.3 INSTRUMENTATION

B 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based on 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. INSERT 1 10

The ESFAS instrumentation is segmented into two ~~three~~ distinct but interconnected modules as identified below: 1

- Field transmitters or process sensors and instrumentation: provide a measurable electronic signal based on the physical characteristics of the parameter being measured~~,~~ and 2

- Signal processing equipment including analog protection system, field contacts, and protection channel sets: provide signal conditioning, bistable setpoint comparison, process algorithm actuation, compatible electrical signal output to protection system channels ~~devices~~, and control board/control room/miscellaneous indications. ~~,~~ ~~and~~ 2 10

- ~~Solid State Protection System (SSPS) including input, logic, and output bays: initiates the proper unit shutdown or engineered safety feature (ESF) actuation in accordance with the defined logic and based on the bistable outputs from the signal process control and protection system.~~ 3

~~The Allowable Value in conjunction with the trip setpoint and LCO establishes the threshold for ESFAS action to prevent exceeding acceptable limits such that the consequences of Design Basis Accidents (DBAs) will be acceptable. The Allowable Value is considered a limiting value such that a channel is OPERABLE if the setpoint is found not to exceed the Allowable Value during the CHANNEL OPERATIONAL TEST (COT). Note that, although a channel is "OPERABLE" under these circumstances, the ESFAS setpoint must be left adjusted to within the established calibration tolerance band of the ESFAS setpoint in accordance with the 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.~~ 10

10

INSERT 1

This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the ESFAS, as well as specifying 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 settings must be chosen so that automatic protective action 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 protective 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. The LSSS values are identified and maintained in the Setpoint Control Program (SCP) controlled by 10.CFR.50.59.

-- REVIEWER'S NOTE --

~~The term "Limiting Trip Setpoint (LTSP)" is generic terminology for the calculated field 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. For most Westinghouse plants the term Nominal Trip Setpoint (NTSP) is used in place of the term LTSP, and NTSP will replace LTSP in the Bases descriptions. "Field setting" is the suggested terminology for the actual setpoint implemented in the plant surveillance procedures where margin has been added to the calculated field setting. The as-found and as-left tolerances will apply to the field setting implemented in the Surveillance procedures to confirm channel performance.~~ 4

~~The [NTSP] is included in the SCP.~~

10

INSERT 1 (continued)

The [NTSP] specified in the SCP is a predetermined setting, plus margin, 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 [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 [NTSP] ensures that SLs are not exceeded. Therefore, the [NTSP] meets the definition of an LSSS (Ref. 1). 11

6

9

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 functions(s)." Relying solely on the [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 [NTSP] due to some drift of the setting may still be OPERABLE since drift is to be expected. This expected drift would have been specifically accounted for in the setpoint methodology for calculating the [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 since it would have performed its safety function and the only corrective action required would be to reset the channel to within the established as-left tolerance around the [NTSP] to account for further drift during the next surveillance interval.

6

Note that, 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).

10 **INSERT 1 (continued)**

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

1. The Departure from Nucleate Boiling Ratio (DNBR) shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling (DNB); 2

2. Fuel centerline melt shall not occur; and 2

3. The RCS pressure SL of 2750 psia shall not be exceeded.

Operation within the SLs of Specification 2.0, "Safety Limits (SLs)," also maintains the above values and assures that offsite dose will be within the 10 CFR 50 and 10 CFR ~~100~~ 50.67 criteria during AOOs. 1

Accidents are events that are analyzed even though they are not expected to occur during the unit life. The acceptable limit during accidents is that offsite dose shall be maintained within an acceptable fraction of 10 CFR ~~100~~ 50.67 limits. Different accident categories are allowed 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. However the acceptable dose limit for an accident category and their associated ~~[~~NTSPs~~]~~ are not considered to be LSSS as defined in 10 CFR 50.36. 1 6

All changes are 1 unless otherwise noted

BACKGROUND (continued)

Field Transmitters or Sensors

To meet the design demands for redundancy and reliability, more than one, and ~~often~~ six as many as ~~four~~, field transmitters or sensors are used to measure unit parameters. In many cases, field transmitters or sensors that input to the ESFAS are shared with the Reactor ~~Trip~~ Protection System (R~~T~~PS). In some cases, the same channels also provide control system inputs. To account for calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in the ~~Trip Setpoint~~ NTSP and Allowable Value~~s~~. The OPERABILITY of each transmitter or sensor is determined by either "as-found" calibration data evaluated during the CHANNEL CALIBRATION or by qualitative assessment of field transmitter or sensor, as related to the channel behavior observed during performance of the CHANNEL CHECK. 6 10

Signal Processing Equipment

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with ~~setpoints~~ NTSPs derived from Analytical Limits established by safety analyses. These ~~setpoints~~ Analytical Limits are defined in ~~F~~ U SAR, Chapter ~~6~~ (Ref. 1), Chapter ~~7~~ (Ref. 2), and Chapter ~~15~~ 14 (Ref. 3). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the ~~SSPS for decision evaluation~~ ESF logic relays. Channel separation is maintained up to and through the ~~input bays~~ logic relay cabinets. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the ~~SSPS~~ ESF logic relays, while others provide input to the ~~SSPS~~ ESF logic relays, the main control board, the unit computer, and one or more control systems. 10 10 6 3

Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If one channel fails in a direction that would not result in a partial Function trip, the Function is still OPERABLE with a two-out-of-two logic. If one channel fails such that a partial Function trip occurs, a trip will not occur and the Function is still OPERABLE with a one-out-of-two logic.

BASES

BACKGROUND (continued)

a protection function

Generally, if a parameter is used for input to ~~the SSPS~~ and a control function, four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Again, a single failure will neither cause nor prevent the protection function actuation. 1

These requirements are described in IEEE-279-1971 (Ref. 4). The actual number of channels required for each unit parameter is specified in Reference 2.

[NTSPs] ~~Allowable Values~~ and ESFAS Setpoints 6 10

calculation

The trip setpoints used in the bistables are based on the analytical limits stated in Reference ~~2~~ 3. The ~~selection~~ of ~~these trip setpoints~~ the Nominal 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 errors for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 5), the Allowable Values specified in ~~Table 3.3.2-1 in the accompanying LCO~~ the SCP are conservative with respect to the analytical limits. A detailed description of the methodology used to calculate the Allowable Values and ESFAS ~~setpoints~~ [NTSPs] including their explicit uncertainties, is provided in the plant specific setpoint methodology study (Ref. 6) which incorporates all of the known uncertainties applicable to each channel. The as-left tolerance and as-found tolerance band methodology is provided in the SCP. The magnitudes of these uncertainties are factored into the determination of each ESFAS ~~setpoint~~ [NTSP] and corresponding Allowable Value. The nominal ESFAS setpoint entered into the bistable is more conservative than that specified by the ~~Allowable Value~~ [NTSP] to account for measurement errors detectable by the COT. The Allowable Value serves as the as-found trip setpoint Technical Specification OPERABILITY limit for the purpose of the COT. ~~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.~~ 9 10 6 6 10

The ~~ESFAS setpoints are the values~~ [NTSP] is the value at which the bistables are set and is the expected value to be achieved during calibration. The ~~ESFAS setpoint~~ [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. Any bistable is considered to be properly adjusted when the "as-left" ~~setpoint~~ [NTSP] value is within the ~~band~~ as-left tolerance for CHANNEL 6 6 6

BASES

BACKGROUND (continued)

and comparator setting

± rack

CALIBRATION uncertainty allowance (i.e., calibration ~~tolerance~~ uncertainties). The ~~ESFAS setpoint~~ value is therefore considered a "nominal value" (i.e., expressed as a value without inequalities) for the purposes of the COT and CHANNEL CALIBRATION. 6 6

[NTSP]

[Nominal Trip Setpoints], in conjunction with the use of as-found and as-left tolerances together

~~Setpoints adjusted consistent~~ with the requirements of the Allowable Value ensure that the consequences of Design Basis Accidents (DBAs) will be acceptable, ~~providing~~ the unit is operated from within the LCOs at the onset of the DBA and the equipment functions as designed. provided 10 8

Note that the Allowable Values listed in the SCP are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION, COT, or a TADOT.

Each channel can be tested on line to verify that the signal processing equipment and setpoint accuracy is within the specified allowance requirements of ~~Reference 2~~. Once a designated channel is taken out of service for testing, a simulated signal is injected in place of the field instrument signal. The process equipment for the channel in test is then tested, verified, and calibrated. SRs for the channels are specified in the SR section.

the SCP

~~Solid State Protection System~~

~~The SSPS equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of SSPS, each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide ESF actuation for the unit. If both trains are taken out of service or placed in test, a reactor trip will result. Each train is packaged in its own cabinet for physical and electrical separation to satisfy separation and independence requirements.~~

~~The SSPS performs the decision logic for most ESF equipment actuation; generates the electrical output signals that initiate the required actuation; and provides the status, permissive, and annunciator output signals to the main control room of the unit.~~ 3

~~The bistable outputs from the signal processing equipment are sensed by the SSPS equipment and combined into logic matrices that represent combinations indicative of various transients. If a required logic matrix combination is completed, the system will send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.~~

BASES

BACKGROUND (continued)

channels

Each SSPS train has a built in testing device that can automatically test the decision logic matrix functions and the actuation devices while the unit is at power. When any one train is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed. The testing device is semiautomatic to minimize testing time. 10 3

The actuation of ESF components is accomplished through master and slave relays. The SSPS energizes the master relays appropriate for the condition of the unit. Each master relay then energizes one or more slave relays, which then cause actuation of the end devices. The master and slave relays are routinely tested to ensure operation. The test of the master relays energizes the relay, which then operates the contacts and applies a low voltage to the associated slave relays. The low voltage is not sufficient to actuate the slave relays but only demonstrates signal path continuity. The SLAVE RELAY TEST actuates the devices if their operation will not interfere with continued unit operation. For the latter case, actual component operation is prevented by the SLAVE RELAY TEST circuit, and slave relay contact operation is verified by a continuity check of the circuit containing the slave relay. 3 5

---------------------------REVIEWER'S NOTE--
No one unit ESFAS incorporates all of the Functions listed in Table 3.3.2-1. In some cases (e.g., Containment Pressure - High 3, Function 2.c), the Table reflects several different implementations of the same Function. Typically, only one of these implementations are used at any specific unit. 4

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

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. For example, Pressurizer Pressure - Low is a primary actuation signal for small ~~loss of coolant accidents (LOCAs)~~ break and a backup actuation signal for steam line breaks (SLBs) outside containment. Functions such as manual initiation, not specifically credited in the accident safety analysis, are ~~qualitatively~~ implicitly credited in the safety analysis and the NRC staff approved licensing basis for the unit. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. These Functions may also serve as backups to Functions that were credited in the accident analysis (Ref. 3). 1 10

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

INSERT 2

, listed in Table 3.3.2-1,

The LCO requires all instrumentation performing an ESFAS Function to be OPERABLE. ~~A channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the calibration tolerance band of the Nominal Trip Setpoint. A trip setpoint may be set more conservative than the Nominal Trip Setpoint as necessary in response to plant conditions.~~ Failure of any instrument renders the affected channel(s) inoperable and reduces the ~~reliability of the affected Functions.~~ 10

INSERT 3

three or four

The LCO generally requires OPERABILITY of ~~four or three~~ channels in each instrumentation function and two channels in each logic and manual initiation function. The two-out-of-three and the two-out-of-four configurations allow one channel to be tripped during maintenance or testing without causing an ESFAS initiation. Two logic or manual initiation channels are required to ensure no single random failure disables the ESFAS. 8

The required channels of ESFAS instrumentation provide unit protection in the event of any of the analyzed accidents. ESFAS protection functions are as follows:

1. Safety Injection

Safety Injection (SI) provides two primary functions:

1. Primary side water addition to ensure maintenance or recovery of reactor vessel water level (coverage of the active fuel for heat removal, clad integrity, and for limiting peak clad temperature to < 2200°F), and

2. Boration to ensure recovery and maintenance of SDM (k_{eff}< 1.0).

10

INSERT 2

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, (i.e., the value indicated is sufficiently close to the necessary value to ensure proper operation of the safety systems to turn the AOO).

10

INSERT 3

The Allowable Value specified in the SCP is the least conservative value of the as-found setpoint that the channel can have when tested, such that a channel is OPERABLE if the as-found setpoint is within the as-found tolerance and is conservative with respect to the Allowable Value during the CHANNEL CALIBRATION or CHANNEL OPERATIONAL TEST (COT). As such, the Allowable Value differs from the [NTSP] by an amount [greater than or] equal to the expected instrument channel uncertainties, such as drift, during the surveillance interval. In this manner, the actual setting of the channel ([NTSP]) will ensure that a SL is not exceeded at any given point of time as long as the channel has not drifted beyond expected tolerances during the surveillance interval. Note that, 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). 6

If the actual setting 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 of the channel will be evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the [NTSP] (within the allowed tolerance) and evaluating the channel response. If the channel is functioning as required and expected to pass the next surveillance, then the channel can be restored to service at the completion of the surveillance. After the surveillance is completed, the channel's as-found setting will be entered into the Corrective Action Program for further evaluation. 6

A trip setpoint may be set more conservative than the [NTSP] as necessary in response to plant conditions. However, in this case, the operability of the instrument must be verified based on the [field setting] and not the NTSP. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. 6 6

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

LOCA and SLB events

These functions are necessary to mitigate the effects of ~~high energy line breaks (HELBs) both inside and outside of containment~~. The SI signal is also used to initiate other Functions such as:

Containment

- ~~Phase A~~ Isolation~~,~~ ; 2

Ventilation

- Containment ~~Purge~~ Isolation~~,~~ ; 2
- Reactor Trip~~,~~ ; 2
- ~~Turbine Trip,~~

Main

- Feedwater Isolation~~,~~ ; 2

; and

- Start of ~~motor driven~~ auxiliary feedwater (AFW) pumps~~,~~ 2
- Control room ventilation isolation~~, and~~ . 2
- ~~Enabling automatic switchover of Emergency Core Cooling Systems (ECCS) suction to containment sump.~~

These other functions ensure:

- Isolation of nonessential systems through containment penetrations~~,~~ ; 2
- Trip of the ~~turbine and~~ reactor to limit power generation~~,~~ ; 2
- Isolation of main feedwater (MFW) to limit secondary side ~~mass losses~~~~,~~ ; contribution to containment pressurization 2
- Start of AFW to ensure secondary side cooling capability~~,~~ ; and 2
- Isolation of the control room to ensure habitability~~, and~~ . 2
- ~~Enabling ECCS suction from the refueling water storage tank (RWST) switchover on low low RWST level to ensure continued cooling via use of the containment sump.~~

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Safety Injection - Manual Initiation

The LCO requires one channel per train to be OPERABLE. The operator can initiate SI at any time by using either of two pushbutton switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for the Manual Initiation Function ensures the proper amount of redundancy is maintained in the manual ESFAS actuation circuitry to ensure the operator has manual ESFAS initiation capability.

Each channel consists of one ~~push button~~ pushbutton switch and the interconnecting wiring to the actuation logic cabinet. Each ~~push button~~ pushbutton switch actuates both trains. This configuration does not allow testing at power.

b. Safety Injection - Automatic Actuation Logic and Actuation Relays

This LCO requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

Manual and automatic initiation of SI must be OPERABLE in MODES 1, 2, and 3. In these MODES, there is sufficient energy in the primary and secondary systems to warrant automatic initiation of ESF systems. Manual Initiation is also required in MODE 4 even though automatic actuation is not required. In this MODE, adequate time is available to manually actuate required components in the event of a DBA, but because of the large number of components actuated on a SI, actuation is simplified by the use of the manual actuation push buttons. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system level manual initiation.

These Functions are not required to be OPERABLE in MODES 5 and 6 because there is adequate time for the operator to evaluate unit conditions and respond by manually starting individual systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. Unit

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

pressure and temperature are very low and many ESF components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of unit systems.

c. Safety Injection - Containment Pressure - High ~~1~~

This signal provides protection against the following accidents:

- SLB inside containment~~,~~ and
- LOCA~~, and~~ .
- ~~Feed line break inside containment.~~

Containment Pressure - High ~~1~~ provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with a two-out-of-three logic. The transmitters (d/p cells) and electronics are located outside of containment with the sensing line (high pressure side of the transmitter) located inside containment.

Thus, the high pressure Function will not experience any ~~adverse environmental conditions and the~~ [NTSP] ~~Trip Setpoint~~ reflects ~~only steady state instrument uncertainties.~~ INSERT 4 10

Containment Pressure - High ~~1~~ must be OPERABLE in MODES 1, 2, and 3 when there is sufficient energy in the primary and secondary systems to pressurize the containment following a pipe break. In MODES 4, 5, and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment.

d. Safety Injection - Pressurizer Pressure – Low

This signal provides protection against the following accidents:

- ~~Inadvertent opening of a steam generator (SG) relief or safety valve,~~
- SLB~~,~~ ; 2

1 **INSERT 4**

; however, the Trip Setpoint is calculated with the consideration of adverse environmental conditions based on the transmitter being exposed to radiation from the accident environment.

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- A spectrum of rod cluster control assembly ejection accidents (rod ejection), ; 2
- Inadvertent opening of a pressurizer relief or safety valve, ; 2
- LOCAs, ; and 2
- SG Tube Rupture.

~~At some units~~ pressurizer pressure provides both control and protection functions: input to the Pressurizer Pressure Control System, reactor trip, and SI. Therefore, the actuation logic must be able to withstand both an input failure to control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Thus, ~~four~~ three OPERABLE channels are required to satisfy the requirements with a two-out-of-~~four~~ three logic. ~~For units that have dedicated protection and control channels, only three protection channels are necessary to satisfy the protective requirements.~~

The transmitters are located inside containment, with the taps in the vapor space region of the pressurizer, and thus possibly experiencing adverse environmental conditions (LOCA, SLB inside containment, rod ejection). Therefore, the ~~Trip Setpoint~~ [NTSP] reflects the inclusion of both steady state and adverse environmental instrument uncertainties. 10 6

This Function must be OPERABLE in MODES 1, 2, and 3 ~~(above P-11)~~ , with pressurizer pressure greater than or equal to 2000 psig, to mitigate the consequences of ~~an HELB inside containment~~ a LOCA or SLB accident. This signal may be manually blocked by the operator ~~below the P-11 setpoint~~ when pressurizer pressure is less than 2000 psig. Automatic SI actuation below this pressure setpoint is then performed by the Containment Pressure - High ~~1~~ signal.

This Function is not required to be OPERABLE in MODE 3 ~~below the P-11 setpoint~~ when pressurizer pressure is less than 2000 psig. Other ESF functions are used to detect accident conditions and actuate the ESF systems in this MODE. In MODES 4, 5, and 6, this Function is not needed for accident detection and mitigation.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

e. Safety Injection - Steam Line Pressure

(1) Steam Line Pressure – Low

Steam Line Pressure - Low provides protection against the following accidents:

- SLB~~,~~ and
- ~~Feed line break, and~~
- Inadvertent opening of an SG relief or an SG safety valve.

Steam Line Pressure - Low provides no input to any control functions. Thus, three OPERABLE channels on each steam line are sufficient to satisfy the protective requirements with a two-out-of-three logic on each steam line.

With the transmitters ~~typically~~ located ~~inside the steam tunnels~~ in close proximity to the main steam lines, it is possible for them to experience adverse environmental conditions during a secondary side break. Therefore, the ~~Trip Setpoint~~ ~~[NTSP]~~ 10 6 reflects ~~both steady state and adverse~~ normal environmental instrument uncertainties. INSERT 5

This Function is anticipatory in nature and has a typical lead/lag ratio of ~~50/5~~ 12/2.

Steam Line Pressure - Low must be OPERABLE in MODES 1, 2, and 3, with pressurizer pressure greater than or equal to 2000 psig, ~~(above P-11)~~ when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This signal may be manually blocked by the operator ~~below the P-11 setpoint~~ when pressurizer pressure is less than 2000 psig. ~~Below P-11~~ When pressurizer pressure is less than 2000 psig, feed line break is not a concern. ~~Inside containment SLB will be terminated by automatic SI actuation via Containment Pressure - High 1, and outside containment SLB will be terminated by the Steam Line Pressure - Negative Rate - High signal for steam line isolation.~~ The steam line break event will be terminated by the SI signal actuation due to the coincidence of Hi-Hi steam flow and Lo-Lo steam pressure. This Function is not required to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to cause an accident.

1 **INSERT 5**

However, the NTSP is calculated with the consideration of normal environmental conditions.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

(2) Steam Line Pressure - High Differential Pressure Between Steam Lines

Steam Line Pressure - High Differential Pressure Between Steam Lines provides protection against the following accidents:

- SLB,
- Feed line break, and
- Inadvertent opening of an SG relief or an SG safety valve.

Steam Line Pressure - High Differential Pressure Between Steam Lines provides no input to any control functions. Thus, three OPERABLE channels on each steam line are sufficient to satisfy the requirements, with a two-out-of-three logic on each steam line.

With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during an SLB event. Therefore, the Trip Setpoint reflects both steady state and adverse environmental instrument uncertainties. Steam line high differential pressure must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). This Function is not required to be OPERABLE in MODE 4, 5, or 6 because there is not sufficient energy in the secondary side of the unit to cause an accident.

5

f, g. Safety Injection - High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low or Coincident With Steam Line Pressure – Low

These Functions (1.f and 1.g) provide protection against the following accidents:

- SLB, and
- the inadvertent opening of an SG relief or an SG safety valve.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Two steam line flow channels per steam line are required OPERABLE for these Functions. The steam line flow channels are combined in a one-out-of-two logic to indicate high steam flow in one steam line. The steam flow transmitters provide control inputs, but the control function cannot cause the events that the Function must protect against. Therefore, two channels are sufficient to satisfy redundancy requirements. The one-out-of-two configuration allows online testing because trip of one high steam flow channel is not sufficient to cause initiation. High steam flow in two steam lines is acceptable in the case of a single steam line fault due to the fact that the remaining intact steam lines will pick up the full turbine load. The increased steam flow in the remaining intact lines will actuate the required second high steam flow trip. Additional protection is provided by Function 1.e.(2), High Differential Pressure Between Steam Lines.

One channel of T_{avg} per loop and one channel of low steam line pressure per steam line are required OPERABLE. For each parameter, the channels for all loops or steam lines are combined in a logic such that two channels tripped will cause a trip for the parameter. For example, for three loop units, the low steam line pressure channels are combined in two-out-of- three logic. Thus, the Function trips on one-out-of-two high flow in any two-out-of-three steam lines if there is one-out-of-one low low T_{avg} trip in any two-out-of-three RCS loops, or if there is a one-out-of-one low pressure trip in any two-out-of-three steam lines. Since the accidents that this event protects against cause both low steam line pressure and low low T_{avg}, provision of one channel per loop or steam line ensures no single random failure can disable both of these Functions. The steam line pressure channels provide no control inputs. The T_{avg} channels provide control inputs, but the control function cannot initiate events that the Function acts to mitigate. 5

The Allowable Value for high steam flow is a linear function that varies with power level. The function is a ΔP corresponding to 44% of full steam flow between 0% and 20% load to 114% of full steam flow at 100% load. The nominal trip setpoint is similarly calculated.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~With the transmitters typically located inside the containment (T_{avg}) or inside the steam tunnels (High Steam Flow), it is possible for them to experience adverse steady state environmental conditions during an SLB event. Therefore, the Trip Setpoint reflects both steady state and adverse environmental instrument uncertainties. The Steam Line Pressure - Low signal was discussed previously under Function 1.e.(1).~~

~~This Function must be OPERABLE in MODES 1, 2, and 3 (above P-12) when a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). This signal may be manually blocked by the operator when below the P-12 setpoint. Above P-12, this Function is automatically unblocked. This Function is not required OPERABLE below P-12 because the reactor is not critical, so feed line break is not a concern. SLB may be addressed by Containment Pressure High 1 (inside containment) or by High Steam Flow in Two Steam Lines coincident with Steam Line Pressure - Low, for Steam Line Isolation, followed by High Differential Pressure Between Two Steam Lines, for SI. This Function is not required to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to cause an accident.~~ 5

2. Containment Spray

Containment Spray provides three primary functions:

a LOCA or main steam line break

1. Lowers containment pressure and temperature after ~~an HELB~~ in containment; 1 2

2. Reduces the amount of radioactive iodine in the containment atmosphere; and 2

spray water and the

3. Adjusts the pH of the water in the containment recirculation sump after a large break LOCA. 1

These functions are necessary to:

- Ensure the pressure boundary integrity of the containment structure; 2

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- Limit the release of radioactive iodine to the environment in the event of a failure of the containment structure~~,~~ ; and 2

- Minimize corrosion of the components and systems inside containment following a LOCA.

The containment spray actuation signal starts the containment spray pumps and aligns the discharge of the pumps to the containment spray nozzle headers in the upper levels of containment. Water is initially drawn from the RWST by the containment spray pumps and mixed with a sodium hydroxide solution from the spray additive tank. ~~When the RWST reaches the low low level setpoint, the spray pump suctions are shifted to the containment sump if continued containment spray is required.~~ INSERT 6 Containment spray is actuated manually ~~by Containment Pressure - High 3 or Containment Pressure - High High~~ or by Containment Pressure – High High.

a. Containment Spray - Manual Initiation

The operator can initiate containment spray at any time from the control room by simultaneously ~~turning~~ depressing two containment spray actuation pushbutton switches ~~in the same train~~. Because an inadvertent actuation of containment spray could have such serious consequences, ~~two~~ both switches must be ~~turned~~ depressed simultaneously to initiate containment spray. ~~There are two sets of two switches each in the control room. Simultaneously turning the two switches in either set will actuate containment spray in both trains in the same manner as the automatic actuation signal.~~ ~~Two~~ One Manual Initiation switch~~es~~ in each train ~~are~~ is required to be OPERABLE to ensure no single failure disables the Manual Initiation Function. Note that Manual Initiation of containment spray also actuates ~~Phase B~~ containment ventilation isolation.

b. Containment Spray - Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

1

INSERT 6

Following the injection phase, after the Refueling Water Storage Tank (RWST) is empty, the Residual Heat Removal (RHR) System is placed in the recirculation mode and the RHR pumps, RHR heat exchangers, and containment spray pumps are placed in series operation. In this mode the RHR pumps provide long-term cooling by taking suction from the containment sump and recirculating the water through the RHR heat exchangers back to the core. Operation of the Containment Spray system while taking suction from the containment sump is not credited in the safety analyses.

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Manual and automatic initiation of containment spray must be OPERABLE in MODES 1, 2, and 3 when there is a potential for an accident to occur, and sufficient energy in the primary or secondary systems to pose a threat to containment integrity due to overpressure conditions. Manual initiation is also required in MODE 4, even though automatic actuation is not required. In this MODE, adequate time is available to manually actuate required components in the event of a DBA. However, because of the large number of components actuated on a containment spray, actuation is simplified by the use of the manual actuation push buttons. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system level manual initiation. In MODES 5 and 6, there is insufficient energy in the primary and secondary systems to result in containment overpressure. In MODES 5 and 6, there is also adequate time for the operators to evaluate unit conditions and respond, to mitigate the consequences of abnormal conditions by manually starting individual components.

c. Containment Spray - Containment Pressure - High High

This signal provides protection against a LOCA or ~~an~~ SLB inside containment. The transmitters (d/p cells) are located outside of containment with the sensing line (high pressure side of the transmitter) located inside containment. The transmitters and electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions and the [NTSP] ~~Trip Setpoint~~ reflects only steady state instrument uncertainties. 10 6 10

This is one of the only Functions that requires the bistable output to energize to perform its required action. It is not desirable to have a loss of power actuate containment spray, since the consequences of an inadvertent actuation of containment spray could be serious. Note that this Function also has the inoperable channel placed in ~~bypass rather than~~ trip ~~to decrease the probability of an inadvertent actuation~~. 12

~~Two different logic configurations are typically used. Three and four loop units use four channels in a two-out-of-four logic configuration. This configuration may be called the Containment Pressure - High 3 Setpoint for three and four loop units, and~~

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Containment Pressure - High High ~~Setpoint for other units.~~ ~~Some two loop units~~ use s three sets of two channels, each set combined in a one-out-of-two configuration, with these outputs combined so that ~~two~~ three -out-of-three sets tripped initiates containment spray. ~~This configuration is called Containment Pressure - High 3 Setpoint. Since containment pressure is not used for control, both of these arrangements exceed the minimum redundancy requirements. Additional redundancy is warranted because this Function is energize to trip.~~ Containment Pressure - ~~[High 3]~~ ~~[~~High High~~]~~ must be OPERABLE in MODES 1, 2, and 3 when there is sufficient energy in the primary and secondary sides to pressurize the containment following a pipe break. In MODES 4, 5, and 6, there is insufficient energy in the primary and secondary sides to pressurize the containment and reach the Containment Pressure - ~~High 3~~ ~~(~~High High~~)~~ setpoints. 6

3. Containment Isolation

Containment Isolation provides isolation of the containment atmosphere, and all process systems that penetrate containment, from the environment. This Function is necessary to prevent or limit the release of radioactivity to the environment in the event of a large break LOCA.

~~There are two separate Containment Isolation signals, Phase A and Phase B. Phase A isolation isolates all automatically isolable process lines, except component cooling water (CCW), at a relatively low containment pressure indicative of primary or secondary system leaks. For these types of events, forced circulation cooling using the reactor coolant pumps (RCPs) and SGs is the preferred (but not required) method of decay heat removal. Since CCW is required to support RCP operation, not isolating CCW on the low pressure Phase A signal enhances unit safety by allowing operators to use forced RCS circulation to cool the unit. Isolating CCW on the low pressure signal may force the use of feed and bleed cooling, which could prove more difficult to control.~~ 5

~~Phase A~~ ~~c~~Containment isolation is actuated automatically by SI, or manually via the automatic actuation logic. All process lines penetrating containment, with the exception of ~~CCW~~ systems required for accident mitigation, are isolated. 5

All changes are 1 unless otherwise noted

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~CCW is not isolated at this time to permit continued operation of the RCPs with cooling water flow to the thermal barrier heat exchangers and air or oil coolers.~~ All process lines not equipped with remote operated isolation valves are manually closed, or otherwise isolated, prior to reaching MODE 4.

depressing pushbutton 5

Manual ~~Phase A~~ Containment Isolation is accomplished by either of two pushbutton switches in the control room. Either switch actuates both trains. Note that manual actuation of ~~Phase A~~ Containment Isolation also actuates Containment Purge and ~~Exhaust~~ Ventilation Isolation. 5

~~The Phase B signal isolates CCW. This occurs at a relatively high containment pressure that is indicative of a large break LOCA or an SLB. For these events, forced circulation using the RCPs is no longer desirable. Isolating the CCW at the higher pressure does not pose a challenge to the containment boundary because the CCW System is a closed loop inside containment. Although some system components do not meet all of the ASME Code requirements applied to the containment itself, the system is continuously pressurized to a pressure greater than the Phase B setpoint. Thus, routine operation demonstrates the integrity of the system pressure boundary for pressures exceeding the Phase B setpoint. Furthermore, because system pressure exceeds the Phase B setpoint, any system leakage prior to initiation of Phase B isolation would be into containment. Therefore, the combination of CCW System design and Phase B isolation ensures the CCW System is not a potential path for radioactive release from containment.~~ 5

~~Phase B containment isolation is actuated by Containment Pressure - High 3 or Containment Pressure - High High, or manually, via the automatic actuation logic, as previously discussed. For containment pressure to reach a value high enough to actuate Containment Pressure - High 3 or Containment Pressure - High High, a large break LOCA or SLB must have occurred and containment spray must have been actuated. RCP operation will no longer be required and CCW to the RCPs is, therefore, no longer necessary. The RCPs can be operated with seal injection flow alone and without CCW flow to the thermal barrier heat exchanger.~~

~~Manual Phase B Containment Isolation is accomplished by the same switches that actuate Containment Spray. When the two switches in either set are turned simultaneously, Phase B Containment Isolation and Containment Spray will be actuated in both trains.~~

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Containment Isolation - ~~Phase A Isolation~~ Manual Initiation 5

(1) ~~Phase A Isolation - Manual Initiation~~

Manual ~~Phase A~~ Containment Isolation is actuated by depressing either of two pushbutton switches in the control room. Either pushbutton switch actuates both trains. Note that manual initiation of ~~Phase A~~ Containment Isolation also actuates Containment ~~Purge~~ Ventilation Isolation. 5

b. Containment

(2) ~~Phase A~~ Isolation - Automatic Actuation Logic and Actuation Relays 5

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

Manual and automatic initiation of ~~Phase A~~ Containment Isolation must be OPERABLE in MODES 1, 2, and 3, when there is a potential for an accident to occur. Manual initiation is also required in MODE 4 even though automatic actuation is not required. In this MODE, adequate time is available to manually actuate required components in the event of a DBA, but because of the large number of components actuated on ~~a Phase A~~ Containment Isolation, actuation is simplified by the use of the manual actuation push buttons. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system ~~level~~ manual initiation. In MODES 5 and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment to require ~~Phase A~~ Containment Isolation. There also is adequate time for the operator to evaluate unit conditions and manually actuate individual isolation valves in response to abnormal or accident conditions. 5

c. Containment

(3) ~~Phase A~~ Isolation - Safety Injection 5

~~Phase A~~ Containment Isolation is also initiated by all Functions that initiate SI. The ~~Phase A~~ Containment Isolation requirements for these Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating Functions and requirements. 5

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Containment Isolation - Phase B Isolation

Phase B Containment Isolation is accomplished by Manual Initiation, Automatic Actuation Logic and Actuation Relays, and by Containment Pressure channels (the same channels that actuate Containment Spray, Function 2). The Containment Pressure trip of Phase B Containment Isolation is energized to trip in order to minimize the potential of spurious trips that may damage the RCPs.

(1) Phase B Isolation - Manual Initiation

(2) Phase B Isolation - Automatic Actuation Logic and Actuation Relays

Manual and automatic initiation of Phase B containment isolation must be OPERABLE in MODES 1, 2, and 3, when there is a potential for an accident to occur. Manual initiation is also required in MODE 4 even though automatic actuation is not required. In this MODE, adequate time is available to manually actuate required components in the event of a DBA. However, because of the large number of components actuated on a Phase B containment isolation, actuation is simplified by the use of the manual actuation push buttons. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system level manual initiation. In MODES 5 and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment to require Phase B containment isolation. There also is adequate time for the operator to evaluate unit conditions and manually actuate individual isolation valves in response to abnormal or accident conditions. 5

(3) Phase B Isolation - Containment Pressure

The basis for containment pressure MODE applicability is as discussed for ESFAS Function 2.c above.

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4. Steam Line Isolation

Isolation of the main steam lines provides protection in the event of a~~n~~ SLB inside or outside containment. Rapid isolation of the steam lines will limit the steam break accident to the blowdown from one SG, at most. For a~~n~~ SLB upstream of the main steam isolation valves (MSIVs), inside or outside of containment, closure of the MSIVs limits the accident to the blowdown from only the affected SG. For a~~n~~ SLB downstream of the MSIVs, closure of the MSIVs terminates the accident as soon as the steam lines depressurize. ~~For units that do not have steam line check valves, Steam Line Isolation also mitigates the effects of a feed line break and ensures a source of steam for the turbine driven AFW pump during a feed line break.~~ 10

a. Steam Line Isolation - Manual Initiation

Manual initiation of Steam Line Isolation can be accomplished from the control room. There are two pushbutton switches in the control room ~~and either switch can initiate action to immediately close all MSIVs.~~ INSERT 7 The LCO requires two channels to be OPERABLE.

b. Steam Line Isolation - Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

Manual and automatic initiation of steam line isolation must be OPERABLE in MODES 1, 2, and 3 when there is sufficient energy in the RCS and SGs to have a~~n~~ SLB or other accident. 10
This could result in the release of significant quantities of energy and cause a cooldown of the primary system. The Steam Line Isolation Function is required in MODES 2 and 3 unless all MSIVs are closed and ~~[~~de-activated~~]~~. In MODES 4, 5, and 6, 6
there is insufficient energy in the RCS and SGs to experience a~~n~~ 10
SLB or other accident releasing significant quantities of energy.

1 **INSERT 7**

, one for Train A and one for Train B and both switches must be depressed in order to close all MSIVs.

All changes are 1 unless otherwise noted

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued) High-High

c. Steam Line Isolation - Containment Pressure - ~~High 2~~ 5

This Function actuates closure of the MSIVs in the event of a LOCA or ~~an~~ SLB inside containment to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. The transmitters (d/p cells) are located outside containment with the sensing line (high pressure side of the transmitter) located inside containment. Containment Pressure - ~~High 2~~ High-High provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with two-out-of-three logic. ~~However, for enhanced reliability, this Function was designed with four channels and a two-out-of-four logic.~~ The transmitters and electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions, and the ~~Trip Setpoint~~ [NTSP] reflects only steady state instrument uncertainties. 10 5 10 6

Containment Pressure - ~~High 2~~ High-High must be OPERABLE in MODES 1, 2, and 3, when there is sufficient energy in the primary and secondary side to pressurize the containment following a pipe break. This would cause a significant increase in the containment pressure, thus allowing detection and closure of the MSIVs. The Steam Line Isolation Function remains OPERABLE in MODES 2 and 3 unless all MSIVs are closed and ~~[~~de-activated~~]~~. In MODES 4, 5, and 6, there is not enough energy in the primary and secondary sides to pressurize the containment to the Containment Pressure - ~~High 2~~ High-High setpoint. 5 6 5

~~d. Steam Line Isolation - Steam Line Pressure~~

~~(1) Steam Line Pressure – Low~~

~~Steam Line Pressure - Low provides closure of the MSIVs in the event of an SLB to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. This Function provides closure of the MSIVs in the event of a feed line break to ensure a supply of steam for the turbine driven AFW pump. Steam Line Pressure - Low was discussed previously under SI Function 1.e.1.~~ 5

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~Steam Line Pressure - Low Function must be OPERABLE in MODES 1, 2, and 3 (above P-11), with any main steam valve open, when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This signal may be manually blocked by the operator below the P-11 setpoint. Below P-11, an inside containment SLB will be terminated by automatic actuation via Containment Pressure - High 2. Stuck valve transients and outside containment SLBs will be terminated by the Steam Line Pressure - Negative Rate - High signal for Steam Line Isolation below P-11 when SI has been manually blocked. The Steam Line Isolation Function is required in MODES 2 and 3 unless all MSIVs are closed and [de-activated]. This Function is not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have an accident.~~

~~(2) Steam Line Pressure - Negative Rate – High~~ 5

~~Steam Line Pressure - Negative Rate - High provides closure of the MSIVs for an SLB when less than the P-11 setpoint, to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. When the operator manually blocks the Steam Line Pressure - Low main steam isolation signal when less than the P-11 setpoint, the Steam Line Pressure - Negative Rate - High signal is automatically enabled. Steam Line Pressure - Negative Rate - High provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy requirements with a two-out-of-three logic on each steam line.~~

~~Steam Line Pressure - Negative Rate - High must be OPERABLE in MODE 3 when less than the P-11 setpoint, when a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). In MODES 1 and 2, and in MODE 3, when above the P-11 setpoint, this signal is automatically disabled and the Steam Line Pressure - Low signal is automatically enabled. The~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Steam Line Isolation Function is required to be OPERABLE in MODES 2 and 3 unless all MSIVs are closed and [de-activated]. In MODES 4, 5, and 6, there is insufficient energy in the primary and secondary sides to have an SLB or other accident that would result in a release of significant enough quantities of energy to cause a cooldown of the RCS.

While the transmitters may experience elevated ambient temperatures due to an SLB, the trip function is based on rate of change, not the absolute accuracy of the indicated steam pressure. Therefore, the Trip Setpoint reflects only steady state instrument uncertainties.

e, f. Steam Line Isolation - High Steam Flow in Two Steam Lines Coincident with T_{avg} - Low Low or Coincident With Steam Line Pressure - Low (Three and Four Loop Units) 5

These Functions (4.e and 4.f) provide closure of the MSIVs during an SLB or inadvertent opening of an SG relief or a safety valve, to maintain at least one unfaulted SG as a heat sink for the reactor and to limit the mass and energy release to containment.

These Functions were discussed previously as Functions 1.f. and 1.g.

These Functions must be OPERABLE in MODES 1 and 2, and in MODE 3, when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines unless all MSIVs are closed and [de-activated]. These Functions are not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have an accident.

d ~~g~~. Steam Line Isolation - High Steam Flow Coincident With Safety Injection and Coincident With T_{avg} - Low Low ~~(Two Loop Units)~~ 5

This Function provides closure of the MSIVs during a~~n~~ SLB or inadvertent opening of an SG relief or safety valve to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. 10

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Two steam line flow channels per steam line are required OPERABLE for this Function. These are combined in a one-out-of-two logic to indicate high steam flow in one steam line. The steam flow transmitters provide control inputs, but the control function cannot cause the events that the function must protect against. Therefore, two channels are sufficient to satisfy redundancy requirements. The one-out-of-two configuration allows online testing because trip of one high steam flow channel is not sufficient to cause initiation.

~~The High Steam Flow Allowable Value is a ΔP corresponding to 25% of full steam flow at no load steam pressure. The Trip Setpoint is similarly calculated.~~ 11

INSERT 8

~~With the transmitters (d/p cells) typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during an SLB event. Therefore,~~ the ~~Trip Setpoints~~ [NTSP] reflect ~~both steady state and adverse~~ normal environmental instrument uncertainties. s 6 10 8

The main steam line isolates only if the high steam flow signal occurs coincident with an SI and low low RCS average temperature. ~~The Main Steam Line Isolation Function requirements for the SI Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating functions and requirements.~~

Two channels of T_{avg} per loop are required to be OPERABLE. The T_{avg} channels are combined in a logic such that two channels tripped cause a trip for the parameter. The accidents that this Function protects against cause a reduction of T_{avg} in the entire primary system. Therefore, the provision of two OPERABLE channels per loop in a two-out-of-four configuration ensures no single random failure disables the T_{avg} - Low Low Function. The T_{avg} channels provide control inputs, but the control function cannot initiate events that the Function acts to mitigate. Therefore, additional channels are not required to address control protection interaction issues. 8

With the T_{avg} resistance temperature detectors (RTDs) located inside the containment, it is possible for them to experience adverse environmental conditions during an SLB event. ~~Therefore, the Trip Setpoint reflects both steady state and adverse environmental instrumental uncertainties.~~

However, the channel statistical allowance calculation does not consider any environmental allowance as part of the instrument uncertainty, since the function is assumed to be performed prior to the time that adverse conditions can affect the Function.

1 **INSERT 8**

The transmitters are located inside containment; however, the trip function is expected to occur at the onset of the accident and therefore, the transmitter will not experience adverse environmental conditions prior to performing its function. As a result,

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All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

,

This Function must be OPERABLE in MODES ~~1~~ ~~and~~ 2, and ~~in~~ ~~MODE~~ 3, ~~when above the P-12 setpoint,~~ when a secondary side break or stuck open valve could result in rapid depressurization of the steam lines. ~~Below P-12 this Function is not required to be OPERABLE because the High High Steam Flow coincident with SI Function provides the required protection.~~ The Steam Line Isolation Function is required to be OPERABLE in MODES 2 and 3 unless all MSIVs are closed and ~~[~~de-activated~~]~~. 6
This Function is not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have an accident.

e ~~h~~. Steam Line Isolation - High High Steam Flow Coincident With Safety Injection (Two Loop Units) 5

This Function provides closure of the MSIVs during a steam line break ~~(or inadvertent opening of a relief or safety valve)~~ to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment.

Two steam line flow channels per steam line are required to be OPERABLE for this Function. These are combined in a one-out-of-two logic to indicate high- high steam flow in one steam line. The steam flow transmitters provide control inputs, but the control function cannot cause the events that the Function must protect against. Therefore, two channels are sufficient to satisfy redundancy requirements.

~~The Allowable Value for high steam flow is a ΔP, corresponding to 130% of full steam flow at full steam pressure. The Trip Setpoint is similarly calculated.~~ 11

INSERT 9

~~With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during an SLB event. Therefore,~~ the ~~Trip Setpoint~~ [NTSP] reflects ~~both steady state and adverse~~ normal environmental instrument uncertainties. 10 6

The main steam lines isolate only if the high- high steam flow signal occurs coincident with an SI signal. The Main Steam Line Isolation Function requirements for the SI Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating functions and requirements.

1

INSERT 9

The transmitters are located inside containment; however, the trip function is expected to occur at the onset of the accident and therefore, the transmitter will not experience adverse environmental conditions prior to performing its function. As a result,

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All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This Function must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in rapid depressurization of the steam lines unless all MSIVs are closed and ~~[~~de-activated~~]~~. This Function is not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have an accident. 6

5. ~~Turbine Trip and~~ Feedwater Isolation 5

The primary function~~s~~ of the ~~Turbine Trip and~~ Feedwater Isolation signal~~s~~ ~~are to prevent damage to the turbine due to water in the~~ is ~~steam lines, and~~ to stop the excessive flow of feedwater into the SGs. ~~These~~ This Function~~s~~ ~~are~~ is necessary to mitigate the effects of a high water level in the SGs, which could result in carryover of water into the steam lines and excessive cooldown of the primary system. The SG high water level is due to excessive feedwater flows.

The Feedwater Isolation ~~Function is actuated when the level in any SG exceeds the high high setpoint, and~~ performs the following functions:

- Trips the main turbine~~,~~; 2
- Trips the MFW pumps~~,~~; 2
- Closes the MFW Pump discharge valves;
- ~~Initiates feedwater isolation,~~ and
- Shuts the MFW ~~regulating~~ control valves and the bypass feedwater ~~regulating~~ control valves.

This Function is actuated by SG Water Level - High High, or by an SI signal. ~~The RTS also initiates a turbine trip signal whenever a reactor trip (P-4) is generated.~~ In the event of SI, the unit is taken off line ~~and the turbine generator must be tripped~~. The MFW System is also taken out of operation and the AFW System is automatically started. The SI signal was discussed previously.

a. ~~Turbine Trip and~~ Feedwater Isolation - Automatic Actuation Logic and Actuation Relays 5

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. ~~Turbine Trip and~~ Feedwater Isolation - Steam Generator Water Level - High High ~~(P-14)~~ 5

This signal provides protection against excessive feedwater flow. The ~~ESFAS~~ SG water level instruments provide input to the SG Water Level Control System. Therefore, the actuation logic must be able to withstand both an input failure to the control system (which may then require the protection function actuation) and a single failure in the other channels providing the protection function actuation. Thus, ~~four~~ three OPERABLE channels are required to satisfy the requirements with a two-out-of-~~four~~ three logic. ~~For units that have dedicated protection and control channels, only three protection channels are necessary to satisfy the protective requirements. For other units that have only three channels, a median signal selector is provided or justification is provided in NUREG-1218 (Ref. 7).~~ The KPS logic design for this Function is justified in Reference 7.

The transmitters (d/p cells) are located inside containment. However, the events that this Function protects against cannot cause a severe environment in containment. Therefore, the ~~Trip Setpoint~~ ~~[~~NTSP~~]~~ reflects only ~~steady state~~ normal environmental instrument uncertainties. 6 10

c. ~~Turbine Trip and~~ Feedwater Isolation - Safety Injection 5

~~Turbine Trip and~~ Feedwater Isolation is also initiated by all Functions that initiate SI. The Feedwater Isolation Function requirements for these Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead Function 1, SI, is referenced for all initiating functions and requirements.

~~Turbine Trip and~~ Feedwater Isolation Functions must be OPERABLE in MODE~~S~~ 1 and MODES 2 ~~[and 3]~~ except when all ~~MFIVs, MFRVs~~ main feedwater isolation valves (MFIVs), main feedwater regulation valves (MFRVs), ~~[~~and associated bypass valves~~]~~ are closed and ~~[de-activated]~~ ~~[~~or isolated by a closed manual valve~~]~~ when the MFW System is in operation ~~and the turbine generator may be in operation~~. In MODES ~~[3,]~~ 4, 5, and 6, the MFW System ~~and the turbine generator are~~ is not in service and this Function is not required to be OPERABLE. 5 6 6 6 6

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

6. Auxiliary Feedwater

The AFW System is designed to provide a secondary side heat sink for the reactor in the event that the MFW System is not available. The system has two motor driven pumps and a turbine driven pump, making it available during normal unit operation, during a loss of AC power, a loss of MFW~~,~~ ~~and during~~ ~~a Feedwater System pipe break~~. The normal source of water for the AFW System is the condensate storage tank (CST) which is ~~normally~~ not safety related). A low level in the CST will alert Operations to manually align ~~automatically realign~~ the pump suctions to the ~~Essential~~ Service Water (~~E~~SW) System (safety related). The AFW System is aligned so that upon a pump start, flow is initiated to the ~~respective~~ SGs immediately.

~~a. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (Solid State Protection System)~~ 5

~~Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.~~

a. ~~b.~~ Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays ~~(Balance of Plant ESFAS)~~ 5

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

b. ~~c.~~ Auxiliary Feedwater - Steam Generator Water Level - Low Low 5

SG Water Level - Low Low provides protection against a loss of heat sink. A feed line break, inside or outside of containment, or a loss of MFW, would result in a loss of SG water level. SG Water Level - Low Low provides input to the SG Water Level Control System. Therefore, the actuation logic must be able to withstand both an input failure to the control system which may then require a protection function actuation and a single failure in the other channels providing the protection function actuation. Thus, three ~~four~~ OPERABLE channels are required to satisfy the requirements with two-out-of-three ~~four~~ logic. ~~For units that have dedicated protection and control channels, only three protection channels are necessary to satisfy the protective requirements.~~ For ~~other~~ units that have only three channels, ~~a median signal selector is provided or~~ justification is provided in Reference 7.

All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

INSERT 10

~~With the transmitters (d/p cells) located inside containment and thus possibly experiencing adverse environmental conditions (feed line break),~~ the ~~Trip Setpoint~~ NTSP reflects the inclusion of ~~both~~ ~~steady state and adverse~~ normal environmental instrument uncertainties. 10 6

c. ~~d.~~ Auxiliary Feedwater - Safety Injection 5

An SI signal starts the motor driven ~~and turbine driven~~ AFW pumps. The AFW initiation functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating functions and requirements.

~~e. Auxiliary Feedwater - Loss of Offsite Power~~

~~A loss of offsite power to the service buses will be accompanied by a loss of reactor coolant pumping power and the subsequent need for some method of decay heat removal. The loss of offsite power is detected by a voltage drop on each service bus. Loss of power to either service bus will start the turbine driven AFW pumps to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip.~~ 5

Functions 6.a through 6.~~e~~ c must be OPERABLE in MODES 1, 2, and 3 to ensure that the SGs remain the heat sink for the reactor. 5
SG Water Level - Low Low in ~~any operating~~ either SG will cause the motor driven AFW pumps to start. The system is aligned so that upon a start of the pump, water immediately begins to flow to the SGs. SG Water Level - Low Low in ~~any two operating~~ both SGs will cause the turbine driven pump~~s~~ to start. These Functions do not have to be OPERABLE in MODES 5 and 6 because there is not enough heat being generated in the reactor to require the SGs as a heat sink. In MODE 4, AFW actuation does not need to be OPERABLE because either AFW or residual heat removal (RHR) will already be in operation to remove decay heat or sufficient time is available to manually place either system in operation.

1 **INSERT 10**

The transmitters are located inside containment; however, the trip function is expected to occur at the onset of the accident and therefore, the transmitter will not experience adverse environmental conditions prior to performing its function. As a result,

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All changes are 1
unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

d. ~~f.~~ Auxiliary Feedwater - Undervoltage Reactor Coolant Pump 5

(1-1 and 1-2)

A loss of power on the buses that provide power to the RCPs provides indication of a pending loss of RCP forced flow in the RCS. The Undervoltage RCP Function senses the voltage INSERT 11 ~~downstream of each RCP breaker.~~ A loss of power ~~, or an open RCP breaker, on two or more RCPs,~~ to both buses will start the turbine driven AFW pump to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip.

e. ~~g.~~ Auxiliary Feedwater - Trip of ~~All~~ Both Main Feedwater Pumps 5

A Trip of ~~all~~ both MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure. ~~A turbine driven MFW pump is equipped with two pressure switches on the control air/oil line for the speed control system. A low pressure signal from either of these pressure switches indicates a trip of that pump.~~ Motor driven MFW pumps are equipped with a breaker position sensing ~~device~~ channel. An open supply breaker indicates that the pump is not running. ~~Two~~ One OPERABLE channel~~s~~ per pump satisf~~y~~ies redundancy requirements with ~~one~~ two-out-of-two taken ~~twice~~ once logic. A trip of ~~all~~ both MFW pumps starts ~~the~~ both motor ~~driven and turbine~~ driven AFW pumps to ensure that at least one SG is available with water to act as the heat sink for the reactor. 10

Functions 6.~~f~~ d and 6.~~g~~ e must be OPERABLE in MODES 1 and 2. This ensures that at least one SG is provided with water to serve as the heat sink to remove reactor decay heat and sensible heat in the event of an accident. In MODES 3, 4, and 5, the RCPs and MFW pumps may be normally shut down, and thus neither pump trip is indicative of a condition requiring automatic AFW initiation. 5

~~h. Auxiliary Feedwater - Pump Suction Transfer on Suction Pressure – Low~~

~~A low pressure signal in the AFW pump suction line protects the AFW pumps against a loss of the normal supply of water for the pumps, the CST. Two pressure switches are located on the AFW pump suction line from the CST. A low pressure signal~~ 5

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1

INSERT 11

via a total of four undervoltage relays (two per bus) fed into a one-out-of-two configuration per bus. The output of each bus is fed into a two-out-of-two logic to indicate an undervoltage condition on both buses.

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All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

sensed by any one of the switches will cause the emergency supply of water for both pumps to be aligned, or cause the AFW pumps to stop until the emergency source of water is aligned. ESW (safety grade) is then lined up to supply the AFW pumps to ensure an adequate supply of water for the AFW System to maintain at least one of the SGs as the heat sink for reactor decay heat and sensible heat removal.

Since the detectors are located in an area not affected by HELBs or high radiation, they will not experience any adverse environmental conditions and the Trip Setpoint reflects only steady state instrument uncertainties. 5

This Function must be OPERABLE in MODES 1, 2, and 3 to ensure a safety grade supply of water for the AFW System to maintain the SGs as the heat sink for the reactor. This Function does not have to be OPERABLE in MODES 5 and 6 because there is not enough heat being generated in the reactor to require the SGs as a heat sink. In MODE 4, AFW automatic suction transfer does not need to be OPERABLE because RHR will already be in operation, or sufficient time is available to place RHR in operation, to remove decay heat.

INSERT 12

7. Automatic Switchover to Containment Sump

At the end of the injection phase of a LOCA, the RWST 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. The low head residual heat removal (RHR) pumps and containment spray pumps draw the water from the containment recirculation sump, the RHR pumps pump the water through the RHR heat exchanger, inject the water back into the RCS, and supply the cooled water to the other ECCS pumps. Switchover from the RWST to the containment sump must occur before the RWST empties to prevent damage to the RHR 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 ESF pump suction. Furthermore, early switchover must not occur to ensure that sufficient borated water is injected from the RWST. This ensures the reactor remains shut down in the recirculation mode. 5

1 **INSERT 12**

7. Turbine Building Service Water Header Isolation

The Service Water (SW) System is designed to provide redundant cooling water for cooling safety related and non-safety related equipment throughout the plant. The SW System consists of four SW pumps, four traveling screens, four rotating SW strainers, and interconnecting piping. The normal source of water for the SW System is Lake Michigan through a submerged multiple inlet structure. The SW System is designed with two redundant headers, each of which is served by two SW pumps. In the event of an accident resulting in Safety Injection (SI) initiation, the two redundant headers are separated by automatically closing the SW header isolation valves. Train specific service water isolation to the non-safety related equipment in the Turbine Building will occur upon a SI sequence concurrent with low service water header pressure. This ensures that safety related equipment will receive sufficient flow under all conditions.

a. Turbine Building Service Water Header Isolation - Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the logic necessary to actuate each of the two trains. The logic for each train includes the same features and operate in the same manner as described for ESFAS Function 1.b, as well as the slave relay fed from the ESFAS Function 1.b and the Service Water Pressure – Low input.

b. Service Water Pressure – Low Coincident with Safety Injection

This function provides automatic isolation of the non-safety (Turbine Building) service water header by closing the open Turbine Building Header isolation valve on receipt of a coincident low service water header pressure signal and a SI signal. This provides a means of isolating non-safety related cooling loads from the safety related cooling loads following an accident to assure adequate cooling is available to the safety related equipment.

The automatic isolation of SW to non-essential load design provides independent and redundant closure signals to the SW-4A (B) valves: A-train to SW-4A and B-train to SW-4B. The closure signals are developed from the SI sequence signal coincident with low SW header pressure on the corresponding A-train and B-train SW headers. Using low header pressure as the coincident signal is appropriate because it indicates that SW supply to the safety related loads will not be adequate unless the SW supply to the non-essential load is isolated.

1 **INSERT 12 (continued)**

> Two pressure switches are required to be OPERABLE for this Function, one for each safeguards SW header. The turbine building header can only be selected to one engineered safeguards header of service water at a time. Each safeguards SW header is capable of handling 100 percent of the post accident SW cooling needs. Since only one safeguards header is selected at any one time to provide turbine building header flow, there is no single failure that can cause both trains of the safeguards service water to be inoperable.

The Safety Injection Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating functions and requirements.

This Function must be OPERABLE in MODES 1, 2, and 3 because the Service Water System is required for cooling of safety related equipment which is necessary for the mitigation of an accident in these MODES and since this is when the actuating signal (SI actuation signal) is required to be OPERABLE. As noted (Note (e)), this Function is not required when one turbine building service water header isolation valve is closed and de-activated. This is acceptable since the closed position is the accident position for the valve and de-activating the valve ensures it will not inadvertently open.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b, c. Automatic Switchover to Containment Sump - Refueling Water Storage Tank (RWST) Level - Low Low Coincident With Safety Injection and Coincident With Containment Sump Level – High

During the injection phase of a LOCA, the RWST is the source of water for all ECCS pumps. A low low level in the RWST coincident with an SI signal provides protection against a loss of water for the ECCS pumps and indicates the end of the injection phase of the LOCA. The RWST is equipped with four level transmitters. These transmitters provide no control functions. Therefore, a two-out-of-four logic is adequate to initiate the protection function actuation. Although only three channels would be sufficient, a fourth channel has been added for increased reliability.

The RWST - Low Low Allowable Value/Trip Setpoint has both upper and lower limits. The lower limit is selected to ensure switchover occurs before the RWST empties, to prevent ECCS pump damage. The upper limit is selected to ensure enough borated water is injected to ensure the reactor remains shut down. The high limit also ensures adequate water inventory in the containment sump to provide ECCS pump suction. 5

The transmitters are located in an area not affected by HELBs or post accident high radiation. Thus, they will not experience any adverse environmental conditions and the Trip Setpoint reflects only steady state instrument uncertainties.

Automatic switchover occurs only if the RWST low low level signal is coincident with SI. This prevents accidental switchover during normal operation. Accidental switchover could damage ECCS pumps if they are attempting to take suction from an empty sump. The automatic switchover Function requirements for the SI Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating Functions and requirements.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

-----------------------------------REVIEWER'S NOTE-----------------------------------
In some units, additional protection from spurious switchover is provided by requiring a Containment Sump Level - High signal as well as RWST Level - Low Low and SI. This ensures sufficient water is available in containment to support the recirculation phase of the accident. A Containment Sump Level - High signal must be present, in addition to the SI signal and the RWST Level - Low Low signal, to transfer the suctions of the RHR pumps to the containment sump. The containment sump is equipped with four level transmitters. These transmitters provide no control functions. Therefore, a two-out-of-four logic is adequate to initiate the protection function actuation. Although only three channels would be sufficient, a fourth channel has been added for increased reliability. The containment sump level Trip Setpoint/Allowable Value is selected to ensure enough borated water is injected to ensure the reactor remains shut down. The high limit also ensures adequate water inventory in the containment sump to provide ECCS pump suction. The transmitters are located inside containment and thus possibly experience adverse environmental conditions. Therefore, the trip setpoint reflects the inclusion of both steady state and environmental instrument uncertainties. 4

Units only have one of the Functions, 7.b or 7.c.

These Functions must be OPERABLE in MODES 1, 2, 3, and 4 when there is a potential for a LOCA to occur, to ensure a continued supply of water for the ECCS pumps. These Functions are not required to be OPERABLE in MODES 5 and 6 because there is adequate time for the operator to evaluate unit conditions and respond by manually starting systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. System pressure and temperature are very low and many ESF components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of unit systems. 5

8. Engineered Safety Feature Actuation System Interlocks

To allow some flexibility in unit operations, an ~~several~~ interlock~~s~~ is ~~are~~ included as part of the ESFAS. The~~se~~ interlock~~s~~ permits the operator to block some signals, automatically enable other signals, prevent some actions from occurring, and cause other actions to occur. The interlock Functions back up manual actions to ensure bypassable functions are in operation under the conditions assumed in the safety analyses. 1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~a.~~ Engineered Safety Feature Actuation System Interlocks - Reactor Trip, P-4 5

The P-4 interlock is enabled when a reactor trip breaker (RTB) and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation is blocked after a 90 ~~[ ]~~ second time delay. This Function allows operators to take manual control of SI systems after the initial phase of injection is complete. Once SI is blocked, automatic actuation of SI cannot occur until the RTBs have been manually closed. The functions of the P-4 interlock are: 6

- Trip the main turbine~~,~~ ; 2
- Isolate MFW with coincident low T_{avg}~~,~~ ; 2
- Prevent reactuation of SI after a manual reset of SI~~,~~ ; and 2
- ~~Transfer the steam dump from the load rejection controller to the unit trip controller, and~~ 1
- Prevent opening of the MFW isolation valves if they were closed on SI or SG Water Level - High High.

Each of the above Functions is interlocked with P-4 to avert or reduce the continued cooldown of the RCS following a reactor trip. An excessive cooldown of the RCS following a reactor trip could cause an insertion of positive reactivity with a subsequent increase in generated power. To avoid such a situation, the noted Functions have been interlocked with P-4 as part of the design of the unit control and protection system.

None of the noted Functions serves a mitigation function in the unit licensing basis safety analyses. Only the turbine trip Function is explicitly assumed since it is an immediate consequence of the reactor trip Function. Neither turbine trip, nor any of the other four Functions associated with the reactor trip signal, is required to show that the unit licensing basis safety analysis acceptance criteria are not exceeded.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The RTB position switches that provide input to the P-4 interlock only function to energize or de-energize or open or close contacts. Therefore, this Function has no adjustable trip setpoint with which to associate a ~~Trip Setpoint~~ NTSP and Allowable Value.

10 6 1

The P-4 interlock is a logic Function with train and not channel identification. Therefore, the LCO requires one channel per train (for each of the two ESFAS Automatic Actuation Logic and Relays trains) of the Engineered Safety Feature Actuation System Interlocks – Reactor Trip, P-4 to be OPERABLE.

This Function must be OPERABLE in MODES 1, 2, and 3 when the reactor may be critical or approaching criticality and the main turbine and MFW System might be in operation. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because the main turbine and the MFW System~~, and the Steam Dump System~~ are not in operation.

1

b. ~~Engineered Safety Feature Actuation System Interlocks - Pressurizer Pressure, P-11~~

~~The P-11 interlock permits a normal unit cooldown and depressurization without actuation of SI or main steam line isolation. With two-out-of-three pressurizer pressure channels (discussed previously) less than the P-11 setpoint, the operator can manually block the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal (previously discussed). When the Steam Line Pressure - Low steam line isolation signal is manually blocked, a main steam isolation signal on Steam Line Pressure - Negative Rate - High is enabled. This provides protection for an SLB by closure of the MSIVs. With two-out-of-three pressurizer pressure channels above the P-11 setpoint, the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal are automatically enabled. The operator can also enable these trips by use of the respective manual reset buttons. When the Steam Line Pressure - Low steam line isolation signal is enabled, the main steam isolation on Steam Line Pressure - Negative Rate - High is disabled. The Trip Setpoint reflects only steady state instrument uncertainties.~~

5

~~This Function must be OPERABLE in MODES 1, 2, and 3 to allow an orderly cooldown and depressurization of the unit without the actuation of SI or main steam isolation. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because system pressure must already be below the P-11 setpoint for the requirements of the heatup and cooldown curves to be met.~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

c. Engineered Safety Feature Actuation System Interlocks - T_{avg} - Low Low, P-12

On increasing reactor coolant temperature, the P-12 interlock reinstates SI on High Steam Flow Coincident With Steam Line Pressure - Low or Coincident With T_{avg} - Low Low and provides an arming signal to the Steam Dump System. On decreasing reactor coolant temperature, the P-12 interlock allows the operator to manually block SI on High Steam Flow Coincident With Steam Line Pressure - Low or Coincident with T_{avg} - Low Low. On a decreasing temperature, the P-12 interlock also removes the arming signal to the Steam Dump System to prevent an excessive cooldown of the RCS due to a malfunctioning Steam Dump System. 5

Since T_{avg} is used as an indication of bulk RCS temperature, this Function meets redundancy requirements with one OPERABLE channel in each loop. In three loop units, these channels are used in two-out-of-three logic. In four loop units, they are used in two-out-of-four logic.

This Function must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to have an accident.

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

ACTIONS

---------------------------REVIEWER'S NOTE---
In Table 3.3.2-1, Functions 7.b and 7.c were not included in the generic evaluations approved in either WCAP-10271, as supplemented, WCAP-15376 or WCAP-14333. In order to apply the WCAP-10271, as supplemented, and WCAP-15376 or WCAP-14333 TS relaxations to plant specific Functions not evaluated generically, licensees must submit plant specific evaluations for NRC review and approval. 4

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 on Table 3.3.2-1.

BASES

ACTIONS (continued)

NTSP 6

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 bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected. When the Required Channels in Table 3.3.2-1 are specified (e.g., on a per steam line, per loop, per SG, etc., basis), then the Condition may be entered separately for each steam line, loop, SG, etc., as appropriate. 10 10

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

~~---------------------------REVIEWER'S NOTE--~~
~~Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use these times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.~~
~~--~~ 4

A.1

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, B.2.1, and B.2.2

Condition B applies to manual initiation of:

- SI~~,~~ ; 2
- Containment Spray~~,~~ ; and 2
- ~~Phase A Isolation, and~~ 5
- ~~Phase B~~ Containment Isolation. 5

BASES

ACTIONS (continued)

ESF relay logic

This action addresses the train orientation of the ~~SSPS~~ for the functions listed above. If a channel or train is inoperable, ~~24~~ 48 hours is allowed to return it to an OPERABLE status. ~~Note that for containment spray and Phase B isolation, failure of one or both channels in one train renders the train inoperable. Condition B, therefore, encompasses both situations.~~ The specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function (except for containment spray which requires 2 manual initiation trains), and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (54 hours total time) and in MODE 5 within an additional 30 hours (84 hours total time). The allowable Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. 1 8 1 1

C.1, C.2.1, and C.2.2

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI~~,~~ ; 2
- Containment Spray~~,~~ ; and 2
- ~~Phase A Isolation,~~ 5
- Containment ~~Phase B~~ Isolation~~, and~~ . 5 2
- ~~Automatic Switchover to Containment Sump.~~ 5

ESF relay logic

This action addresses the train orientation of the ~~SSPS~~ and the master and slave relays. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. The 24 hours allowed for restoring the inoperable train to OPERABLE status is justified in Reference 8. The specified Completion Time is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within 1

BASES

ACTIONS (continued)

an additional 6 hours (30 hours total time) and in MODE 5 within an additional 30 hours (60 hours total time). The Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

The Required Actions are modified by a Note that allows one train to be bypassed for up to [4] hours for surveillance testing, provided the other train is OPERABLE. This allowance is based on the reliability analysis assumption of WCAP-10271-P-A (Ref. 9) that 4 hours is the average time required to perform train surveillance. 6

D.1, D.2.1, and D.2.2

Condition D applies to:

- Containment Pressure - High 1, ; 5 2
- Pressurizer Pressure - Low (two, three, and four loop units), ; 1 2
- Steam Line Pressure - Low, ; 2
- ~~Steam Line Differential Pressure - High,~~ 5
- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low or Coincident With Steam Line Pressure - Low,~~ 5
- Steam Line Isolation Containment Pressure - High 2 High-High, ; 5 2
- ~~Steam Line Pressure - Negative Rate - High,~~ 5
- High Steam Flow Coincident With Safety Injection Coincident With T_{avg} - Low Low, ; 2
- High High Steam Flow Coincident With Safety Injection, ; 2
- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low,~~ 5
- SG Water level - Low Low (two, three, and four loop units), ; and 1 2
- [SG Water level - High High (P-14) (two, three, and four loop units).] 6 5 1

BASES

ACTIONS (continued)

If one channel is inoperable, 72 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. Generally this Condition applies to functions that operate on two-out-of-three logic. Therefore, failure of one channel places the Function in a two-out-of-two configuration. One channel must be tripped to place the Function in a one-out-of-~~three~~ two configuration that satisfies redundancy requirements. The 72 hours allowed to restore the channel to OPERABLE status or to place it in the tripped condition is justified in Reference 8. 8

Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 72 hours requires the unit be placed in MODE 3 within the following 6 hours (78 hours total time) and MODE 4 within the next 6 hours (84 hours total time). 7

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.

~~[~~ The Required Actions are modified by a Note that allows the inoperable channel to be bypassed for up to 12 hours for surveillance testing of other channels. The 12 hours allowed for testing, are justified in Reference 8. ~~]~~ 6 6

~~------------------------------REVIEWER'S NOTE------------------------------~~
~~The below text should be used for plants with installed bypass test capability:~~ 4

~~The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 8.~~
~~--~~

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

Condition E applies to~~:~~ 5

~~•~~ Containment Spray Containment Pressure ~~- High 3 (High, High) (two, three, and four loop units), and~~ - High High. 5 1

~~• Containment Phase B Isolation Containment Pressure - High 3 (High, High).~~ 5

BASES

ACTIONS (continued)

INSERT 13

None of these signals has input to a control function. Thus, two-out-of-three logic is necessary to meet acceptable protective requirements. However, a two-out-of-three design would require tripping a failed channel. This is undesirable because a single failure would then cause spurious containment spray initiation. Spurious spray actuation is undesirable because of the cleanup problems presented. Therefore, these channels are designed with two-out-of-four logic so that a failed channel may be bypassed rather than tripped. Note that one channel may be bypassed and still satisfy the single failure criterion. Furthermore, with one channel tripped ~~bypassed~~, a single instrumentation channel failure will not spuriously initiate containment spray. 1 1 12

INSERT 14

To avoid the inadvertent actuation of containment spray and Phase B containment isolation, the inoperable channel should not be placed in the tripped condition. Instead it is bypassed. Restoring the channel to OPERABLE status, or placing the inoperable channel in the trip ~~bypass~~ condition within 72 hours, is sufficient to assure that the Function remains OPERABLE and minimizes the time that the Function may be in a partial trip condition (assuming the inoperable channel has failed high). The Completion Time is further justified based on the low probability of an event occurring during this interval. Failure to restore the inoperable channel to OPERABLE status, or place it in the tripped ~~bypassed~~ condition within 72 ~~6~~ hours, requires the unit be placed in MODE 3 within the following 6 hours (78 hours total time) and MODE 4 within the next 6 hours (84 hours total time) ~~72 hours~~. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE. 12 12 12 8 7

~~[~~ The Required Actions are modified by a Note that allows one additional channel to be bypassed for up to 12 hours for surveillance testing. Placing a second channel in the bypass condition for up to 12 hours for testing purposes is acceptable based on the results of Reference 8. ~~]~~ 6 6

---------------------------REVIEWER'S NOTE--
The below text should be used for plants with installed bypass test capability:

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 8. 4
----

1 **INSERT 13**

Condition E addresses the situation where two of the six containment pressure channels are inoperable at the same time. With one channel inoperable, one of the three sets is actuated. A second inoperable channel could actuate the second set.

1 **INSERT 14**

With one channel tripped, one OPERABLE channel remains available to actuate the second set and two OPERABLE channels are available to provide the one-out-of-two logic for the third set to actuate containment spray.

BASES

ACTIONS (continued)

F.1, F.2.1, and F.2.2

Condition F applies to:

- Manual Initiation of Steam Line Isolation, ; 2
- Loss of Offsite Power, ; and 2
- ~~Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low, and~~ 1
- P-4 Interlock.

For the Manual Initiation and the P-4 Interlock Functions, this action addresses the train orientation of the ~~SSPS~~ ESF relay logic. For the Loss of Offsite Power Function, this action recognizes the lack of manual trip provision for a failed channel. ~~For the AFW System pump suction transfer channels, this action recognizes that placing a failed channel in trip during operation is not necessarily a conservative action. Spurious trip of this function could align the AFW System to a source that is not immediately capable of supporting pump suction.~~ If a train or channel is inoperable, 48 hours is allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of these Functions, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within the next 6 hours (54 hours total time) and MODE 4 within the following 6 hours (60 hours total time). The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above. 1 1 7

G.1, G.2.1, and G.2.2

Condition G applies to the automatic actuation logic and actuation relays for the Steam Line Isolation ~~[~~, ~~Turbine Trip and~~ Feedwater Isolation, ~~]~~ and AFW actuation Functions. 6 5

BASES

ACTIONS (continued)

ESF relay logic

The action addresses the train orientation of the ~~SSPS~~ and the master and slave relays for these functions. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. The 24 hours allowed for restoring the inoperable train to OPERABLE status is justified in Reference 8. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be returned to OPERABLE status, the unit must be brought to MODE 3 within the next 6 hours (30 hours total time) and MODE 4 within the following 6 hours (36 hours total time). The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the protection channels and actuation functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above. 1 7

The Required Actions are modified by a Note that allows one train to be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Ref. 9) assumption that 4 hours is the average time required to perform channel surveillance. 6

[H.1 and H.2

Condition H applies to the automatic actuation logic and actuation relays for the Turbine Trip and Feedwater Isolation Function.

This action addresses the train orientation of the SSPS and the master and slave relays for this Function. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status or the unit must be placed in MODE 3 within the following 6 hours. The 24 hours allowed for restoring the inoperable train to OPERABLE status is justified in Reference 8. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. These Functions are no longer required in MODE 3. Placing the unit in MODE 3 removes all requirements for OPERABILITY of the protection channels and actuation functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above. 5

BASES

ACTIONS (continued)

~~The Required Actions are modified by a Note that allows one train to be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE. This allowance is based on the reliability analysis (Ref. 9) assumption that 4 hours is the average time required to perform channel surveillance.]~~ 5

H

~~[~~H.1 and ~~[~~H.2 5

Condition ~~[~~H applies to~~:~~ 5

- ~~[SG Water Level - High High (P-14) (two, three, and four loop units), and]~~ 5
- Undervoltage Reactor Coolant Pump. 5

If one channel is inoperable, 72 hours are allowed to restore one channel to OPERABLE status or to place it in the tripped condition. If placed in the tripped condition, the Function is then in a partial trip condition where one-out-of-two channels on the other bus ~~or one-out-of-three logic~~ will result in actuation. Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 72 hours requires the unit to be placed in MODE 3 within the following 6 hours (78 hours total time). The allowed Completion Time of 78 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE. 1 7

~~[~~ The Required Actions are modified by a Note that allows the inoperable channel to be bypassed for up to ~~[~~12~~]~~ hours for surveillance testing of other channels. The 72 hours allowed to place the inoperable channel in the tripped condition, and the 12 hours allowed for a second channel to be in the bypassed condition for testing, are justified in Reference 8. ~~]~~ 6 6 6

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~The below text should be used for plants with installed bypass test capability:~~

~~The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The 72 hours allowed to place the inoperable channel in the tripped condition, and the 12 hours allowed for a second channel to be in the bypassed condition for testing, are justified in Reference 8.~~
~~--~~ 4

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BASES

ACTIONS (continued)

I I 5

~~J~~.1 and ~~J~~.2

I both

Condition ~~J~~ applies to the AFW pump start on trip of ~~all~~ MFW pumps. 5 1

ESF relay logic

This action addresses the train orientation of the ~~SSPS~~ for the auto start function of the AFW System on loss of ~~all~~ MFW pumps. The both OPERABILITY of the AFW System must be assured by allowing automatic start of the AFW System pumps. If a channel is inoperable, 48 hours are allowed to return it to an OPERABLE status. If the function cannot be returned to an OPERABLE status, 6 hours are allowed to place the unit in MODE 3 (54 hours total time). The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above. The allowance of 48 hours to return the train to an OPERABLE status is justified in Reference 9. 1 7

INSERT 15 5

K.1, K.2.1, and K.2.2

Condition K applies to:

- RWST Level - Low Low Coincident with Safety Injection, and
- RWST Level - Low Low Coincident with Safety Injection and Coincident with Containment Sump Level - High.

RWST Level - Low Low Coincident With SI and Coincident With Containment Sump Level - High provides actuation of switchover to the containment sump. Note that this Function requires the bistables to energize to perform their required action. The failure of up to two channels will not prevent the operation of this Function. However, placing a failed channel in the tripped condition could result in a premature switchover to the sump, prior to the injection of the minimum volume from the RWST. Placing the inoperable channel in bypass results in a two-out-of-three logic configuration, which satisfies the requirement to allow another failure without disabling actuation of the switchover when required. Restoring the channel to OPERABLE status or placing the inoperable channel in the bypass condition within [6] hours is sufficient to ensure that the Function remains OPERABLE, and minimizes the time that the Function may be in a partial trip condition (assuming the 5

5 **INSERT 15**

J.1

Condition J applies to the Turbine Building Service Water Header Isolation Automatic Actuation Logic and Actuation Relays and Service Water Pressure – Low.

If one or more trains or channels are inoperable, the associated Service Water train must be immediately declared inoperable. This requires entry into the applicable Conditions and Required Actions of LCO 3.7.8, "Service Water System." The actions of this LCO provide adequate compensatory actions to assure plant safety.

BASES

ACTIONS (continued)

inoperable channel has failed high). The [6] hour Completion Time is justified in Reference 10. If the channel cannot be returned to OPERABLE status or placed in the bypass condition within 6 hours, the unit must be brought to MODE 3 within the following [6] hours and MODE 5 within the next 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above. 5

[The Required Actions are modified by a Note that allows placing a second channel in the bypass condition for up to [4] hours for surveillance testing. The total of [12] hours to reach MODE 3 and [4] hours for a second channel to be bypassed is acceptable based on the results of Reference 10.]

---------------------------REVIEWER'S NOTE---
The below text should be used for plants with installed bypass test capability:

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The channel to be tested can be tested in bypass with the inoperable channel also in bypass. The total of [12] hours to reach MODE 3 and [4] hours for a second channel to be bypassed is acceptable based on the results of Reference 10. 4

<u>L.1, L.2.1, and L.2.2</u>

Condition L applies to the P-11 and P-12 [and P-14] interlocks.

With one or more channels inoperable, the operator must verify that the interlock is in the required state for the existing unit condition. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks. 5

BASES

SURVEILLANCE REQUIREMENTS

---------------------------REVIEWER'S NOTE---
~~In Table 3.3.2-1, Functions 7.b and 7.c were not included in the generic evaluations approved in either WCAP-10271, as supplemented, or WCAP-14333. In order to apply the WCAP-10271, as supplemented, and WCAP-14333 TS relaxations to plant specific Functions not evaluated generically, licensees must submit plant specific evaluations for NRC review and approval.~~
--- 4

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

----------------------------REVIEWER'S NOTE---
~~Certain Frequencies are based on approved topical reports. In order for a licensee to use these times, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~
--- 4

SR 3.3.2.1

Performance of the CHANNEL CHECK once every 12 hours 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.

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. 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.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.2.2

ESF relay logic

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. The ~~SSPS~~ is tested every 92 days on a STAGGERED TEST BASIS~~, using the semiautomatic tester~~. The train being tested is placed in the ~~bypass~~ test condition, thus preventing inadvertent actuation. ~~Through the semiautomatic tester,~~ ~~all~~ possible logic combinations~~, with and without applicable permissives,~~ are tested for each protection function. ~~In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils.~~ The Frequency of every 92 days on a STAGGERED TEST BASIS is justified in Reference ~~11~~. 10 1 9

~~SR 3.3.2.3~~

~~SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST as described in SR 3.3.2.2, except that the semiautomatic tester is not used and the continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have the SSPS test circuits installed to utilize the semiautomatic tester or perform the continuity check. This test is also performed every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.~~ 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) is justified in Reference 11. The Frequency of 92 days is justified in Reference 9. 5

Move SR 3.3.2.3 from page B 3.3.2-51 to here

SR 3.3.2.~~5~~ 4 5

SR 3.3.2.~~5~~ is the performance of a COT. 5 10

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[~~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.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. ~~Setpoints must be found within the Allowable Values specified in Table 3.3.1-1.~~ 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 COT 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. 10

~~The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.~~ 10

~~The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 6.~~

The Frequency of 184 days is justified in Reference ~~1~~1. 9
10

BASES

SURVEILLANCE REQUIREMENTS (continued)

5

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.7 3 5

SR 3.3.2.7 is the performance of a TADOT every [92] days. This test is a check of the Loss of Offsite Power, Undervoltage RCP, and AFW Pump Suction Transfer on Suction Pressure - Low Functions. Each Function is tested up to, and including, the master transfer relay coils. 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 TADOT 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. 5 6

Move to previous page before SR 3.3.2.4

~~The test also includes trip devices that provide actuation signals directly to the SSPS. The~~ SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. The Frequency is adequate. It is based on industry operating experience, considering instrument reliability and operating history data. 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.8 5 5

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. It is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. 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 TADOT 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 some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints. 5 6

INSERT 16 10

SR 3.3.2.9 6 5

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION. 5

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy. 6

~~CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.~~ 10

INSERT 17 10

The Frequency of [18] months is based on the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology. 6

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

10

INSERT 16

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the [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. 6

10

INSERT 17

The test is performed in accordance with the SCP. If the actual setting 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 of the channel will be further evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the [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. 6

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the Technical Requirements Manual, Section 15 (Ref. 12). 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 equipment in both trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

For channels that include dynamic transfer functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer functions set to one with the resulting measured response time compared to the appropriate FSAR response time. Alternately, the response time test can be performed with the time constants set to their nominal value provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured. 13

----------------------------REVIEWER'S NOTE--
Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A (Ref. 9). and/or WCAP-14036-P (Ref. 10).

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," (Ref. 13) dated January 1996, 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 WCAP. Response time verification for other sensor types must be demonstrated by test.

BASES

SURVEILLANCE REQUIREMENTS (continued)

WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 14) provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter. 13

ESF RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every [18] months. The [18] month Frequency is consistent with the typical refueling cycle and is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching [1000] psig in the SGs.

SR 3.3.2.11 7 5

5

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock, and the Frequency is ~~once per RTB cycle.~~ 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 TADOT 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 Frequency is based on operating experience demonstrating that undetected failure of the P-4 interlock sometimes occurs when the RTB is cycled. 5 5

prior to closing the reactor trip breaker or reactor trip bypass breaker following each reactor trip breaker cycle. A reactor trip breaker cycle is defined as when a reactor trip breaker and its associated reactor trip bypass breaker are opened.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

INSERT 18 5

5

INSERT 18

SR 3.3.2.8 is the performance of an ACTUATION LOGIC TEST. The Turbine Building Service Water Header Isolation relay logic is tested every 18 months. For the portion of the logic common to the ESFAS, Function 1.b ACTUATION LOGIC TEST, the train being tested is placed in the test condition, thus preventing inadvertent actuation, and all possible SI logic combinations are tested for each protection function. For the portion of the logic not tested as part of the ESFAS Function 1.b ACTUATION LOGIC TEST (e.g., the slave relays), actuation of the end devices may occur. The Frequency of every 18 months is based on the refueling outage cycle, since the slave relay cannot be tested at power without resulting in actuation of affected components.

BASES

REFERENCES

1. ~~F~~SAR, Chapter ~~[~~6~~]~~. U

2. ~~F~~SAR, Chapter ~~[~~7~~]~~. U

3. ~~F~~SAR, Chapter ~~[15]~~. 14

1 6

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. ~~Plant-specific setpoint methodology study.~~ Technical Report EE-0116, Revision 5, "Allowable Values for North Anna Improved Technical Specifications (ITS) Table 3.3.1-1 and 3.3.2-1, Setting Limits for Surry Custom Technical Specifications (CTS), Sections 2.3 and 3.7, and Allowable Values for Kewaunee Power Station Improved Technical Specifications (ITS) Functions listed in Specification 5.5.16." 1

7. ~~NUREG-1218, April 1988~~. Letter from C. R. Steinhardt (WPSC) to NRC Document Control Desk, "Kewaunee Nuclear Power Plant Response to Generic Letter 89-19," dated March 19, 1990. 1

8. WCAP-14333-P-A, Rev. 1, October 1998.

9. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

~~10. [Plant specific evaluation reference.]~~ 9

10 ~~11~~. WCAP-15376, Rev. 0. October 2000. 9

11. Regulatory Guide 1.105, "Setpoints for Safety Related Instrumentation," Revision 3. 10

~~12. Technical Requirements Manual, Section 15, "Response Times."~~

~~13. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.~~ 9 5

~~14. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995.~~

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2 BASES, ENGINEERED SAFETY FEATURE 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 or licensing basis description.

2. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

3. The Kewaunee Power Station (KPS) design of the ESFAS Instrumentation logic uses a relay protection system, not a Solid State Protection System (SSPS). Therefore, all references to a SSPS have been deleted from the Bases.

4. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

5. Changes are made to reflect changes made to the Specification.

6. The ISTS Bases contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design

7. Changes are made to reflect the Specifications.

8. Grammatical/editorial error corrected.

9. The Bases References have been changed to reflect the plant specific references. As such, when a reference has been deleted, the subsequent reference number has been changed.

10. Changes are made to the ISTS Bases that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications.

11. The ISTS Bases for Function 4.g (ITS Function 4.d) contains a statement, in part, that the Steam Line Isolation High Steam Flow Allowable Value is a differential pressure corresponding to 25% of full steam flow at no load steam pressure. The ISTS Bases for Function 4.h (ITS Function 4.e) contains a statement, in part, that the Steam Line Isolation High-High Steam Flow Allowable Value is a differential pressure corresponding to 130% of full steam flow at full steam pressure. The ITS does not include the Allowable Value discussion from the two aforementioned Functions since this type of detailed plant specific information is not typical of the

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2 BASES, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

type of the information contained within the Bases. Allowable Values are typically found in a plant specific setpoint calculation or Setpoint Control Program document. At KPS, the Allowable Values for the Steam Line Isolation High Steam Flow and the High-High Steam Flow Functions will be contained and controlled in accordance with the Setpoint Control Program. In addition, the only ISTS ESFAS Functions that discuss the Allowable Values to this detail are those relative to steam flow as found in ISTS Functions 1.f, 1.g, 4.g, and 4.h. This change to not include the Allowable Value information in the ITS Bases is acceptable because this type of information is not necessary to be retained in the Technical Specifications and is better suited to be retained and controlled in the Setpoint Control Program document.

12. Reference is made to placing a channel in bypass or bypassing an inoperable channel. KPS does not have the ability to place a channel in bypass or perform a bypass of an inoperable channel without performing a temporary alteration of the circuit. Since the installation of temporary alterations is intrusive, KPS has determined that this practice is unacceptable. Therefore, KPS does not have the ability place a channel in bypass or perform a bypass of an inoperable channel. As a result, when a channel is required to be placed in bypass or a bypass of an inoperable channel is required, the channel is placed in the trip condition. This change is also consistent with changes made to the Specifications.

13. Response Time testing has been deleted. See ITS 3.3.2 JFD 15 for justification for exclusion of Response Time testing.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 3

ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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

ITS

A01

ITS 3.3.3

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1.

See ITS 3.3.2, 3.3.5, and 3.3.6

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5.

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable.

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip.

See ITS 3.3.1, 3.3.2, 3.3.5, and 3.3.6

LCO 3.3.3

Applicability

ACTIONS A, B, C, D, and E

e. The accident monitoring instrumentation in Table TS 3.5-6 shall be OPERABLE whenever the plant is above HOT SHUTDOWN. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes. A change in operational MODES or conditions is acceptable with an inoperable accident monitoring instrumentation channel(s).

Add proposed MODE 3 Applicability

M01

M02

Add proposed ACTIONS Note

A04

Amendment No. 105
02/09/94

A01

Table 3.3.3-1, Function

TABLE TS 3.5-6

A02

ACCIDENT MONITORING INSTRUMENTATION OPERATING CONDITIONS FOR INDICATION

		1	2
NO.	FUNCTIONAL UNIT	REQUIRED TOTAL NO. OF CHANNELS	MINIMUM CHANNELS OPERABLE(1)
1	Auxiliary Feedwater Flow to Steam Generators (Narrow Range Level Indication Already Required OPERABLE by Table TS 3.5-2, Item 12)	1/steam generator(2)	R01
18 2	Reactor Coolant System Subcooling Margin	2(2)	1
3	Pressurizer Power Operated Relief Valve Position (One Common Channel Temperature, One Channel Limit Switch per Valve)	2/valve(2)	1/valve R01
4	Pressurizer Power Operated Relief Block Valve Position (One Common Channel Temperature, One Channel Limit Switch per Valve)	2/valve(2)	1/valve R01
5	Pressurizer Safety Valve Position (One Channel Temperature, and One Acoustic Sensor per Valve)	2/valve(2)	1/valve R01
7 6	Containment Water Level (Wide Range)	2(2)	1
7	Deleted		
8 8	Containment Pressure Monitor (Wide Range)	2(2)	1
6 9	Reactor Vessel Level Indication A05	4 2(4)	1
14, 15 16, 17 10	Core Exit Thermocouples(5) A03	4 thermocouple/core quadrant(4)	2 thermocouple/core quadrant(6)
12 11	Steam Generator Level (Wide Range)	2/steam generator(4)	1/steam generator

ACTION E

ACTION C

7 days L02

(1) With the number of OPERABLE accident monitoring instrumentation channels less than the minimum channels OPERABLE requirements, either restore the minimum number of channels to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

30 M04

(2) With the number of OPERABLE accident monitoring instrumentation channels less than the required total number of channels shown, either restore the inoperable channels to OPERABLE status within 14 days, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

L01

Add proposed ACTION B L01

ACTION A

Amendment No. 174
05/13/2004

A01

TABLE TS 3.5-6

ACTION A

(3) Deleted

ACCIDENT MONITORING INSTRUMENTATION OPERATING CONDITIONS FOR INDICATION L01

30

(4) With the number of OPERABLE accident monitoring instrumentation channels less than the required total number of channels shown, either restore the inoperable channels to OPERABLE status within 7 days, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

Add proposed ACTION B L01

(5) Refer also to TS 3.11.c and TS 3.11.d A03

(6) For the purposes of accident monitoring instrumentation, thermocouples on the axis may be included in either adjacent quadrant. LA01

Add proposed Functions 1, 2, 3, 4, 5, 9, 10, 11, 13, 19, 20, and 21 requirements and proposed ACTIONS A, B, C, D, and E M03

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3.11 CORE SURVEILLANCE INSTRUMENTATION

APPLICABILITY

Applies to the operability of the movable detector instrumentation system and the core thermocouple instrumentation system.

OBJECTIVE

To specify operability requirements for the movable detector and core thermocouple systems.

SPECIFICATIONS

a. The movable detector system shall be operable following the initial fuel loading and each subsequent reloading and the power distribution confirmed before the reactor is operated at >75% power. If the system is not completely operable, the measurement error allowance due to incomplete mapping shall be substantiated by the licensee. See CTS 3.11

b. A minimum of 2 movable detector thimbles per quadrant, and sufficient detectors, drives, and readout equipment to map these thimbles, shall be available during re-calibration of the excore axial offset detection system.

Table 3.3.3-1, Functions 14, 15, 16, and 17

c. A minimum of 4 thermocouples per quadrant shall be available for readout if the reactor is operated above 85% with one excore nuclear power channel out of service. in MODES 1, 2, and 3 M05

Applicability

d. The licensee shall utilize his best effort to maintain the movable detector system and the core thermocouple system in an operable state so that surveillance of the core power distribution may be performed. If more than one half of either See CTS 3.11

ITS A01 ITS 3.3.3

4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SPECIFICATION

SR 3.3.3.1, SR 3.3.3.2, SR 3.3.3.3

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3. See other ITS

c. Deleted

d. Deleted

e. Deleted

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ITS

A01

ITS 3.3.3

TABLE TS 4.1-1

See ITS 3.3.2

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

SR 3.3.3.1 SR 3.3.3.2

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
11. a. Steam Generator Low Level	Each shift	Each refueling cycle	Monthly	See ITS 3.3.1 and 3.3.2
b. Steam Generator High Level	Each shift	Each refueling cycle	Monthly	
12. Steam Generator Flow Mismatch	Each shift	Each refueling cycle	Monthly	See ITS 3.3.1
~~13. Deleted~~				
14. Residual Heat Removal Pump Flow	Each shift (when in operation)	Each refueling cycle	Not applicable	
~~15. Deleted~~				
16. Refueling Water Storage Tank Level	~~Weekly~~ Every 31 days	Annually	Not applicable	
~~17. Deleted~~				

Table 3.3.3-1, Function 20

L03

Amendment No. 151
02/12/2001

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A01

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

See ITS 3.3.1, 3.3.2, and 3.8.1

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
24. Turbine First Stage Pressure	Each shift	Each refueling cycle	Monthly	
25. Deleted				
26. Protective System Logic Channel Testing	Not applicable	Not applicable	Monthly	Includes auto load sequencer
27. Deleted				
28. Deleted				
29. Seismic Monitoring System	Each refueling cycle	Each refueling cycle	Not applicable	R02
30. Fore Bay Water Level	Not applicable	Each refueling cycle	Each refueling cycle	
31. AFW Flow Rate	(a)	Each refueling cycle	Not applicable	(a) Flow rate indication will be checked at each unit startup and shutdown
32. PORV Position Indication	Monthly	Each refueling cycle	Not applicable	R01
a. Back-up (Temperature)	Monthly	Each refueling cycle	Not applicable	R01
33. PORV Block Valve Position Indicator	Monthly	Each refueling cycle	Not applicable	R01

See ITS 3.7.8

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ITS

ITS 3.3.3

A01

Table 3.3.3-1, Function 8

Table 3.3.3-1, Function 18

See ITS 3.3.2

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

SR 3.3.3.1 SR 3.3.3.3

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
34. Safety Valve Position Indicator (Acoustic)	Monthly	Each refueling cycle	Not applicable	R01
a. Back-up (Temperature)	Monthly	Each refueling cycle	Not applicable	
35. FW Pump Trip (AFW Initiation)	Not applicable	Not applicable	Each refueling cycle	
36. Reactor Coolant System Subcooling Monitor	Monthly	Each refueling cycle	Each refueling cycle	L04
37. Containment Pressure (Wide Range)	Daily Every 31 days L03	Each refueling cycle	Not applicable	
~~38. Deleted~~		M06	A06	
39. Containment Water Level (Wide Range)	Not applicable Every 31 days	Not applicable Every 18 months	Each refueling cycle	
40. Reactor Vessel Level Indication	Monthly	Each refueling cycle	Not applicable	
41. Core Exit Thermocouples	Monthly	Each refueling cycle	Not applicable	
42. Steam Generator Level (Wide Range)	Monthly	Each refueling cycle	Not applicable	

Table 3.3.3-1, Function 12

Table 3.3.3-1, Functions 14, 15, 16, and 17

Table 3.3.3-1, Function 6

Table 3.3.3-1, Function 7

Add proposed SR 3.3.3.1 and SR 3.3.3.3 for Table 3.3.3-1 Functions 1, 2, 3, 4, 5, 9, 10, 11, 13, 19, and 21

M03

Amendment No. 174
05/13/2004

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DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse 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 TS 3.5-6 includes both "REQUIRED TOTAL NO. OF CHANNELS" and "MINIMUM CHANNELS OPERABLE" columns. The number of channels specified in the two columns is different, with the "MINIMUM CHANNELS OPERABLE" column specifying fewer channels. The purpose of the two columns is to specify when Table TS 3.5-6 Notes (1), (2), and (4) are to be entered. ITS Table 3.3-3-1 only has a single column, the "REQUIRED CHANNELS" column. This column includes the same number of channels as in the CTS "REQUIRED TOTAL NO. OF CHANNELS" column. ITS 3.3.3 ACTIONS A, B, C, D, and E provide similar actions for when required channels are inoperable (either one or two or more channels), similar to the Actions provided in CTS Table TS 3.5-6 Notes (1), (2), and (4). This changes the CTS by including only one column specifying the number of channels required to be OPERABLE, with the Conditions in the ITS ACTIONS covering the appropriate conditions under which actions are required with inoperable channels.

The purpose of two columns is to provide details as to which action is required when channels are inoperable. This change is acceptable since the ITS continues to provide similar conditions, in the ITS ACTIONS in lieu of in a Table. The ITS continues to include the required channels that must be OPERABLE to meet the LCO 3.3.3 requirements. This change is designated as administrative since it does not result in any technical changes.

A03 CTS Table TS 3.5-6, Functional Unit 10, Core Exit Thermocouples, Note (5) states "Refer also to TS 3.11.c and TS 3.11.d." CTS 3.11 is the Core Surveillance Instrumentation that will not be included in the ITS. ISTS 3.3.3, Functions 14 thru 17 are the core exit thermocouples; however, there is no reference in ITS 3.3.3 to a separate Specification for the core exit thermocouples. However the requirements of CTS 3.11.c, as applicable, are included in ITS 3.3.3. This changes the CTS by deleting this reference to a CTS Section that is not included in the ITS.

This change is acceptable because the requirements of CTS 3.11, as they relate to PAM Instrumentation, have not been changed except where justified in another ITS. ITS 3.3.3 still retains the requirement for the Core Exit Thermocouples as part of the PAM Instrumentation. This change is designated as administrative because it does not result in technical changes to the CTS

A04 CTS 3.5.e and Table TS 3.5-6 Notes (1), (2), and (4) provide the compensatory actions to take when a PAM Instrumentation channel is inoperable. ITS 3.3.3 ACTIONS includes a Note that allows separate condition entry for each Function.

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DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

In addition, since the required channels for Function 12 are on a per steam generator basis, a separate condition entry is allowed within this Function for each steam generator. This modifies the CTS by providing a specific allowance to enter the Action for each inoperable PAM Instrumentation Function and for a certain Function on a steam generator basis.

This change is acceptable because it clearly states the current requirement. The CTS considers each PAM instrument Function to be separate and independent from the others. In addition, the channels associated with Function 12 are allowed separate Condition entry on the specified basis (i.e., steam generator) since the channels associated with each steam generator will provide the associated PAM Instrumentation Function 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.

A05 CTS Table TS 3.5-6 No. 9 (Reactor Vessel Level Indication), requires, in part, two channels to be OPERABLE. ITS 3.3.3 Table 3.3.3-1 Function 6 requires, in part, two channels to be OPERABLE when the Reactor Coolant Pumps (RCP) are on and two channels to be OPERABLE when the RCPs are off. This changes the CTS by requiring 4 channels to be OPERABLE in the ITS for the Reactor Vessel Level Indication.

This change is acceptable because the requirements have not changed. In the CTS, one of the channels required by Table TS 3.5-6 No. 9 includes an RCP on transmitter and indicator as well as an RCP off transmitter and indicator, while the other channel required by TS Table 3.5-6 No. 9 includes an RCP on transmitter and indicator as well as an RCP off transmitter and indicator. Thus, KPS requires two indicators to be OPERABLE when the RCPs are on and two different indicators are required to be OPERABLE when the RCPs are off. Therefore this change is considered acceptable since it reflects the current licensing requirements and is only considered a change in presentation. This change is considered administrative because it does not result in a technical change to the CTS.

A06 CTS Table TS 4.1-1 Channel Description 39 requires the performance of a CHANNEL FUNCTIONAL TEST of the Containment Water Level (Wide Range) channel each refueling cycle. ITS SR 3.3.3.3 requires the performance of CHANNEL CALIBRATION every 18 months for Functions other than Function 20 of ITS Table 3.3.3-1. The Containment Sump Water Level (Wide Range) is Function 7 of ITS Table 3.3.3-3. This changes the CTS by requiring the performance of a CHANNEL CALIBRATION in ITS instead of a CHANNEL FUNCTIONAL TEST in CTS.

The current method of performing the CHANNEL FUNCTIONAL TEST of the Containment Sump Water Level (Wide Range) channel consists of a calibration of the level instrumentation. In essence, the current requirement to perform a CHANNEL FUNCTIONAL TEST is being satisfied by a CHANNEL CALIBRATION. Therefore, this change is acceptable and is considered administrative because the technical requirements have not changed.

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DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

MORE RESTRICTIVE CHANGES

M01 CTS 3.5.e requires the accident monitoring instrumentation in Table TS 3.5-6 to be OPERABLE whenever the plant is above HOT SHUTDOWN; i.e., in OPERATING and HOT STANDBY MODES (ITS equivalent MODES 1 and 2). ITS 3.3.3 is applicable in MODES 1, 2, and 3. This changes the CTS by requiring the PAM Instrumentation to be OPERABLE in MODE 3.

The purpose of the PAM Instrumentation is to provide the indications for the operators to reach and maintain MODE 3 operation. Thus, the instruments are required in MODE 3 to be able to maintain MODE 3 conditions. Furthermore, the required variables are related to the diagnosis and the pre-planned actions to mitigate DBAs. These applicable accidents could occur in MODE 3, as well as the assumed MODES 1 and 2. Therefore, this change is acceptable and is designated as more restrictive since it requires the PAM Instrumentation to be OPERABLE in more MODES in the ITS than in the CTS.

M02 CTS 3.5.e states that when PAM instrumentation is inoperable, a change in operational MODES or conditions is acceptable. ITS 3.3.3 does not include this allowance. However, ITS LCO 3.0.4 includes a similar allowance, except that ITS LCO 3.0.4.b requires, prior to changing MODES, the performance of a risk assessment addressing inoperable systems and components, consideration of the results, a determination of the acceptability of entering the MODE or other specified condition in the Applicability, and the establishment of risk management actions, if appropriate. This changes the CTS by deleting this specific allowance from the PAM Instrumentation Specification and allowing ITS LCO 3.0.4 to govern this allowance, and modifying the allowance to require a risk assessment prior to using the allowance.

The purpose of this requirement is to allow MODE changes while a PAM channel is inoperable. This allowance is being maintained in ITS LCO 3.0.4; however, a risk assessment is now needed prior to using the allowance. The risk assessment must determine the acceptability of entering the MODE and the establishment of risk management actions, if appropriate. As such, this change is acceptable since it will require a specific evaluation each time it is used. This change is designated as more restrictive since a specific evaluation is now required in the ITS that was not required in the CTS.

M03 CTS Table TS 3.5-6 does not require OPERABLE indication channels for Intermediate Range Neutron Flux, Steam Generator Pressure, Reactor Coolant System (RCS) Hot Leg Temperature, RCS Cold Leg Temperature, RCS Pressure (Wide Range), Penetration Flow Path Containment Isolation Valve (CIV) Position, Containment Area Radiation (High Range), Pressurizer Level, Service Water (SW) Supply Valve to Auxiliary Feedwater Pumps, Steam Generator Level (Narrow Range), Refueling Water Storage Tank Level, and Heat Removal by the Containment Fan Coil Units (Service Water Supply Valve Position Indication). These indication channels are added to the CTS and shown in ITS Table 3.3.3-1, Functions 1, 2, 3, 4, 5, 9, 10, 11, 13, 19, 20, and 21. Two channels per Function are required for the following Functions: Intermediate Range Neutron Flux (Function 1), RCS Hot Leg Temperature (Function 3), RCS Cold Leg Temperature (Function 4), Containment Area Radiation (High Range)

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ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

(Function 10), Pressurizer Level (Function 11), Refueling Water Storage Tank Level (Function 20). In addition, two channels per steam generator are required for the Steam Generator Pressure (Function 2), two channels per penetration are required for the Penetration Flow Path Containment Isolation Valve Position (Function 9), three channels are required for the Service Water Supply Valve to Auxiliary Feedwater Pumps (Function 13), two channels per steam generator are required for the Steam Generator Level (Function 19), and four channels are required for the Heat Removal by the Containment Fan Coil Units (Service Water Supply Valve Position Indication) (Function 21). Furthermore, the requirements for Function 9 are modified by two footnotes, footnotes (a) and (b). Footnote (a) does not require position indication for isolation valves whose associated 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 for penetration flow paths with only one installed control room indication channel. ITS 3.3.3 ACTION A has been added to cover the Condition when one or more of the above Functions has one required channel inoperable. ITS 3.3.3 Required Action A.1 allows 30 days to restore the required channel to OPERABLE status. If the Required Action and Completion Time of Condition A is not met, then ITS Required Action B.1 requires the immediate initiation of actions specified in Specification 5.6.4. ITS 3.3.3 ACTION C has been added to cover the Condition when one or more of the above Functions have two or more required channels inoperable. ITS 3.3.3 Required Action C.1 requires restoration of all but one channel to OPERABLE status within 7 days. If this cannot be met, or if the Required Action and Associated Completion Time of Condition C is not met, then ITS 3.3.3 Condition D must be entered, which then requires entry into Condition E. ITS 3.3.3 Required Action E.1 requires 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 for Function 9 on a penetration flow path basis and Functions 2 and 19 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 3.3.3.1) and a CHANNEL CALIBRATION (SR 3.3.3.3). This changes the CTS by adding new Functions and applicable ACTIONS and SRs.

This change is acceptable because a plant specific evaluation has concluded that these plant instrumentation channels are required to provide the primary, unambiguous information to the operator necessary in order 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. That is, they are either Type A or Category 1 variables, or both. These new Function requirements are consistent with the KPS Regulatory Guide 1.97 evaluation. The change is designated as more restrictive because 14 new PAM Instrumentation Functions are added to the Technical Specifications.

M04 CTS Table TS 3.5-6 Footnote (1) states, in part, that with the number of OPERABLE accident monitoring instrumentation channels less than the minimum channels OPERABLE requirements, and not restored within the allowed time, a unit shutdown to HOT STANDBY (equivalent to ITS MODE 2) within 6 hours and to HOT SHUTDOWN (equivalent to ITS MODE 3) within the

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following 6 hours is required. ITS 3.3.3 Required Action E.1 requires that the unit be in MODE 3 within 6 hours and ITS 3.3.3 Required Action E.2 requires that the unit be in MODE 4 within 12 hours. This change deletes the requirement to be in HOT STANDBY (equivalent to ITS MODE 2) within 6 hours, changes the time required to be in HOT SHUTDOWN (equivalent to ITS MODE 3) from 12 hours to 6 hours, and adds a new Required Action to be in ITS MODE 4 within 12 hours.

The purpose of CTS Table TS 3.5-6 Footnote (1) is to place the unit in a condition in which the LCO does not apply. 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. Allowing 6 hours to be in MODE 3 in lieu of the current 12 hours and 12 hours to be in MODE 4 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the Accident Monitoring instrumentation to OPERABLE status within the allowed Completion Time. The new requirement to be in MODE 4 is consistent with exiting the new Applicability added by DOC M01. Additionally, since ITS 3.3.3 Required Action E.1 requires the unit to be in MODE 3 within 6 hours, there is no need to maintain the requirement to be MODE 2 within 6 hours. This change is designated as more restrictive because the less time is allowed for the unit to reach MODE 3 in the ITS than is allowed in the CTS and a new requirement to be in MODE 4 is included in the ITS.

M05 CTS 3.11.c states that a minimum of four thermocouples per quadrant shall be available for readout if the reactor is operated above 85% with one excore nuclear power channel out of service. ITS Table 3.3.3-1 Functions 14, 15, 16, and 17 require four thermocouples/core quadrant to be OPERABLE in MODES 1, 2, and 3. This changes the CTS by requiring the Core Exit Thermocouples be OPERABLE in more MODES than in CTS.

The function of the Core Exit Thermocouples is to provide an independent means of measuring the balance of power among the core quadrants and for unit stabilization and cooldown control. The change in Applicability is acceptable because the PAM Instrumentation variables are utilized to ensure sufficient information is available on selected plant parameters to aid the operator in identification of an accident and assessment of plant conditions during and following an accident which is assumed to occur in MODES 1, 2, and 3. This change is designated as more restrictive because the LCO is applicable in more MODES in the ITS than in the CTS.

M06 CTS Table TS 4.1-1 Channel Description 39, Containment Water Level (Wide Range), does not require the performance of a CHANNEL CHECK. ITS SR 3.3.3.1 requires the performance of a CHANNEL CHECK for each required instrumentation channel that is normally energized every 31 days. This changes the CTS by adding a new Surveillance Requirement for the Containment Sump Water Level (Wide Range) Function.

The purpose of the new Surveillance Requirement is to ensure the Containment Sump Water Level (Wide Range) instrumentation responds to the measured

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parameter and the indication is within the necessary range and accuracy of the instrumentation. 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 in order 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 more restrictive because a new Surveillance Requirement is added to the Technical Specifications.

<u>RELOCATED SPECIFICATIONS</u>

R01 CTS Tables TS 3.5-6 and TS 4.1-1 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 W.S. Wilgus (B&W Owners Group). The screening criteria are now incorporated into 10 CFR 50.36(c)(2)(ii). The NRC position taken was that the post-accident monitoring instrumentation table list should contain, on a plant specific basis, all Regulatory Guide 1.97 Type A plant instruments specified in the plant's Safety Evaluation Report (SER) on Regulatory Guide 1.97, and all Regulatory Guide 1.97 Category 1 plant instruments. Accordingly, this position has been applied to KPS Regulatory Guide 1.97 plant instruments. Those plant instruments meeting these criteria have been retained in the ITS. The instruments not meeting these criteria will be relocated from the Technical Specifications to the Technical Requirements Manual (TRM).

A review of the KPS USAR and the NRC Regulatory Guide 1.97 Safety Evaluation for KPS shows that the following CTS Table TS 3.5-6 and TS 4.1-1 Instruments do not meet Category 1 or Type A requirements.

Functional Unit 1/Channel Description 31, AFW Flow Rate
Functional Unit 3/Channel Descriptions 32 and 32.a, PORV Position
Functional Unit 4/Channel Description 33, PORV Block Valve Position
Functional Unit 5/Channel Descriptions 34 and 34.a, Pressurizer Safety Valve Position

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

1. These instruments are not installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. These instruments do not satisfy criterion 1.

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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 presents a challenge to the integrity of a fission product barrier. These instruments do not satisfy criterion 2.

3. These instruments are not a structure, system, or component that is part of a primary success path and 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. These instruments do not satisfy criterion 3.

4. These instruments are not a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety. As discussed in Section 4.0 (Table 1, page 9 and Appendix A, page A-25) of WCAP-11618, the loss of the above listed instruments was found to be a non-significant risk contributor to core damage frequency and offsite releases. Dominion Energy Kewaunee (DEK) has reviewed this evaluation, considers it applicable to Kewaunee Power Station (KPS), and concurs with the assessment. These instruments do not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the above listed instruments may be relocated out of 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 these Specifications did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and have been relocated to the TRM.

R02 CTS Table TS 4.1-1 Channel Description 29 provides requirements for seismic instrumentation. In the event of an earthquake, seismic instrumentation is required to permit comparison of the measured response to that used in the design basis of the facility to determine if plant shutdown is required pursuant to Appendix A of 10 CFR 100. Since this is determined after the event has occurred, it has no bearing on the mitigation of any design basis accident (DBA). The ITS does not include this Specification. This changes the CTS by relocating this Specification to the Technical Requirements Manual (TRM).

This change is acceptable because CTS Tables TS 3.5-6 and TS 4.1-1 Channel Description 29 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

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

1. Seismic instrumentation is not installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. The Seismic Instrumentation Specification does not satisfy criterion 1.

2. Seismic instrumentation is not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient

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analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The Seismic Instrumentation Specification does not satisfy criterion 2.

3. Seismic instrumentation is not a structure, system, or component that is part of a primary success path and 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. The Seismic Instrumentation Specification does not satisfy criterion 3.

4. Seismic instrumentation is not a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety. As discussed in Section 4.0 (Table 1, page 8 and Appendix A, page A-22) of WCAP-11618, Seismic Instrumentation was found to be a non-significant risk contributor to core damage frequency and offsite releases. Dominion Energy Kewaunee (DEK) has reviewed this evaluation, considers it applicable to Kewaunee Power Station (KPS), and concurs with the assessment. The Seismic Instrumentation Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Seismic Instrumentation Specification may be relocated out of the Technical Specifications. The Seismic Instrumentation Specification 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 relocation because the Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

<u>REMOVED DETAIL CHANGES</u>

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Footnote (6) to Functional Unit 10, Core Exit Thermocouples, of CTS Table TS 3.5-6 states for the purposes of accident monitoring instrumentation, thermocouples on the axis may be included in either adjacent quadrant. ITS 3.3.3 does not contain this information. This changes the CTS by removing the details of the system design 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 to provide adequate protection of public health and safety. The ITS still maintains the requirement for the number of required channels that must be OPERABLE and the appropriate Condition to enter if a required 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 system design is being removed from the Technical Specifications.

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LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS Table TS 3.5-6 Footnote (2), which is applicable to CTS Table TS 3.5-6 Functions 2, 6, and 8, states, in part, that with the number of OPERABLE accident monitoring instrumentation channels less than the required total number of channels shown in Column 1 of CTS Table TS 3.5-6, restore the inoperable channels to OPERABLE status within 14 days. CTS Table TS 3.5-6 Footnote (4), which is applicable to CTS Table TS 3.5-6 Functions 9, 10, and 11, states, in part, that with the number of OPERABLE accident monitoring instrumentation channels less than the required total number of channels shown in Column 1 of CTS Table TS 3.5-6, restore the inoperable channels to OPERABLE status within 7 days. If the channel is not restored within the 14 day or 7 day time period, Footnotes (2) and (4) require the unit to be in HOT STANDBY (equivalent to ITS MODE 2) within 6 hours and HOT SHUTDOWN (equivalent to ITS MODE 3) within the next 6 hours. Under similar conditions (i.e., one of the required channels of a Function inoperable), ITS 3.3.3 Required Action A.1 (which is applicable to all the above Functions) requires the inoperable channel to be restored OPERABLE status within 30 days. If the Required Action and Completion Time of Condition A is not met, then ITS 3.3.3 Required Action B.1 requires the immediate initiation of actions specified in Specification 5.6.4. This changes the CTS by allowing a longer time to restore the inoperable channel to OPERABLE status in ITS than is allowed in CTS and by deleting the requirements for the unit to be in HOT STANDBY and HOT SHUTDOWN with one of the required channels inoperable and not restored within the allowed restoration time, and instead requiring a report to be made in accordance with Specification 5.6.4.

The purpose of the Footnotes (2) and (4) actions is to provide some time to restore the inoperable channel, and if not restored within that time, to shut down the unit to exit the Applicability of the PAM Instrumentation Specification. This change is acceptable because the Completion Time of 30 days is based on operating experience and takes into account the remaining OPERABLE channel(s), the passive function of these instruments, and the operator's ability to respond to an accident utilizing redundant or alternate instruments and methods of monitoring. This change is also considered acceptable since the probability of an event requiring the operator to utilize this instrumentation to respond to the event is low. The addition of a report is acceptable because it advises the NRC of the cause of the inoperability and the plans and schedule for restoring the instrumentation channel to OPERABLE status. This change is designated as less restrictive because additional time is allowed to restore instrument channels to OPERABLE status than was allowed in the CTS.

L02 *(Category 3 – Relaxation of Completion Time)* CTS Table TS 3.5-6 Footnote (1), which is applicable to CTS Table TS 3.5-6 Functions 2, 6, 8, 9, 10, and 11, states, in part, that with the number of OPERABLE accident monitoring instrumentation channels less than the minimum channels shown in Column 2 of CTS Table TS 3.5-6, restore the inoperable channels to OPERABLE status within 72 hours. Under similar conditions (i.e., two or more of the required channels of a Function inoperable), ITS 3.3.3 Required Action C.1 (which is applicable to all the above Functions) requires restoration of all but one of the inoperable channels to OPERABLE status within 7 days. This changes the CTS

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by allowing a longer time to restore an inoperable channel to OPERABLE status in the ITS than is allowed in CTS.

The purpose of the Footnote (1) action is to provide some time to restore an inoperable channel prior to requiring a unit shutdown. This change is acceptable due to the passive function of these instruments and the operator's ability to respond to an accident utilizing redundant or alternate instruments and methods of monitoring. This change is also considered acceptable since the probability of an event requiring the operator to utilize this instrumentation to respond to the event is low. This change is designated as less restrictive because additional time is allowed in the ITS to restore instrument channels to OPERABLE status than was allowed in the CTS.

L03 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table TS 4.1-1 Channel Description 16 requires a weekly CHANNEL CHECK of the Refueling Water Storage Tank Level channels. CTS Table TS 4.1-1 Channel Description 37 requires a daily CHANNEL CHECK of the Containment Pressure (Wide Range) channels. ITS Table 3.3.3-1 Functions 8 (Containment Pressure (Wide Range) and 20 (Refueling Water Storage Tank Level) require performance of a CHANNEL CHECK every 31 days (ITS SR 3.3.3.1). This changes the CTS by changing the Frequency from daily to 31 days for CTS Table TS 4.4-1 Channel Description 37 and from weekly to 31 days for CTS Table TS 4.4-1 Channel Description 16.

The purpose of the CHANNEL CHECK is to perform a qualitative assessment to ensure that gross instrumentation failure has not occurred. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. This change is also acceptable since a Frequency of 31 days for the CHANNEL CHECK of this instrumentation provides adequate assurance that a gross failure will be detected since operating experience demonstrates that channel failure is rare. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L04 *(Category 5 – Deletion of Surveillance Requirement)* CTS Table TS 4.1-1 Channel Description 36 requires the performance of a CHANNEL FUNCTIONAL TEST of the Reactor Coolant System Subcooling Monitor channel each refueling cycle. ITS Table 3.3.3-1 Function 18 (RCS Subcooling Margin Monitor) does not require this test. This changes the CTS by deleting the refueling cycle CHANNEL FUNCTIONAL TEST of the Reactor Coolant System Subcooling Monitor channels.

The purpose of the refueling cycle CHANNEL FUNCTIONAL TEST associated with CTS Table TS 4.1-1 Channel Description 36 is to ensure all circuitry associated with the Reactor Coolant System Subcooling Monitor Function channel is OPERABLE. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the capability of equipment used to meet the LCO is consistent with assumptions in the safety analysis. The ITS still requires a CHANNEL CALIBRATION at the same Frequency (18 months, which is the KPS refueling cycle). The definition of CHANNEL CALIBRATION includes all the devices in the channel required for

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channel OPERABILITY. Thus appropriate equipment continues to be tested in a manner and at a Frequency necessary to give confidence that the assumptions in the safety analyses are satisfied. The ITS SRs for the instruments continue to provide sufficient test requirements to ensure the OPERABILITY of the Reactor Coolant System Subcooling Monitor PAM instrumentation. The ITS SRs are consistent with other PAM instrumentation channels and ensure the Functions remain OPERABLE. This change is designated as less restrictive because a specific Surveillance which is specified in the CTS will not be explicitly specified in the ITS.

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

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

3.5.e LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

3.5.e, 3.11.c APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTE---

DOC A04 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.5.e, Table TS 3.5-6 Footnote (2), DOC M03	A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	
3.5.e, Table TS 3.5-6 Footnotes (2) and (4), DOC M03	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.$\boxed{5}$ 4.	Immediately	1
3.5.e, Table TS 3.5-6 Footnote (1), DOC M03	C. One or more Functions with two or more required channels inoperable.	C.1 Restore all but one required channel to OPERABLE status.	7 days	6
3.5.e, DOC M03	D. Required Action and associated Completion Time of Condition C not met.	D.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately	

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CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.5.e, Table TS 3.5-6 Footnote (1), DOC M03	E. As required by Required Action D.1 and referenced in Table 3.3.3-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours	
	~~F. As required by Required Action D.1 and referenced in Table 3.3.3-1.~~	~~F.1 Initiate action in accordance with Specification 5.6.5.~~	~~Immediately~~	7

These SRs

SURVEILLANCE REQUIREMENTS

---NOTE---

~~SR 3.3.3.1 and SR 3.3.3.2~~ apply to each PAM instrumentation Function in Table 3.3.3-1 except where identified in the SR. 4

	SURVEILLANCE		FREQUENCY	
Table TS 4.1-1, Channel Descriptions 16, 36, 37, 39, 40, 41, & 42, DOC M03	SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days	
Table TS 4.1-1, Channel Descriptions 36, 37, 39, 40, 41, & 42, DOC M03	SR 3.3.3.~~2~~ 3	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION for Functions other than Function 20.	~~[~~18~~]~~ months	4 4 2

INSERT 1 4

CTS

3.3.3

4

INSERT 1

Table TS 4.4-1, Channel Description 16	SR 3.3.3.2	Perform CHANNEL CALIBRATION for Function 20.	12 months

CTS

All changes are 3 unless otherwise noted

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

CTS		FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1
DOC M03	1.	Intermediate ~~Power~~ Range Neutron Flux	2	E
DOC M03	2.	Steam Generator Pressure ~~Source Range Neutron Flux~~	2 per steam generator	E
DOC M03	3.	Reactor Coolant System (RCS) Hot Leg Temperature	2 ~~per loop~~	E
DOC M03	4.	RCS Cold Leg Temperature	2 ~~per loop~~	E
DOC M03	5.	RCS Pressure (Wide Range)	2	E
Table TS 3.5-6, No. 9	6.	Coolant Inventory (Reactor Vessel Level Indicating System) ~~Reactor Vessel Water Level~~	~~2~~	~~F~~
		INSERT 1A		
Table TS 3.5-6, No. 6	7.	Containment Sump Water Level (Wide Range)	2	E
Table TS 3.5-6, No. 8	8.	Containment Pressure (Wide Range)	2	E
DOC M03	9.	Penetration Flow Path Containment Isolation Valve (CIV) Position	2 per penetration flow path(a)(b)	E
DOC M03	10.	Containment Area Radiation (High Range)	2	E ~~F~~ 7
DOC M03	11.	Pressurizer Level	2	E
Table TS 3.5-6, No. 11	12.	Steam Generator Water Level (Wide Range)	2 per steam generator	E
DOC M03	13.	Auxiliary Feedwater (AFW) System Service Water (SW) Supply ~~Condensate Storage Tank Level~~	~~2~~	~~E~~
		INSERT 2		
Table TS 3.5-6, No. 10	14.	Core Exit Temperature - Quadrant ~~[1]~~	2~~(c)~~ 4	E 2
Table TS 3.5-6, No. 10	15.	Core Exit Temperature - Quadrant ~~[2]~~	2~~(c)~~ 4	E 2
Table TS 3.5-6, No. 10	16.	Core Exit Temperature - Quadrant ~~[3]~~	2~~(c)~~ 4	E 2
Table TS 3.5-6, No. 10	17.	Core Exit Temperature - Quadrant ~~[4]~~	2~~(c)~~ 4	E 2
Table TS 3.5-6, No. 2	18.	RCS Subcooling Margin Monitor ~~Auxiliary Feedwater Flow~~	2	E

INSERT 3

(a) Not required for isolation valves whose associated 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.

(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 core exit thermocouples (CETs).~~

~~------REVIEWER'S NOTE------~~
~~Table 3.3.3-1 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 in accordance with the unit's Regulatory Guide 1.97, Safety Evaluation Report.~~
~~------~~

5

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CTS

3.3.3

3

INSERT 1A

DOC A05	a.	Reactor Coolant Pumps (RCPs) ON	2	E	7
DOC A05	b.	RCPs OFF	2	E	7

3

INSERT 2

DOC M03	a.	SW Supply Valve to AFW Pumps	3	E
DOC M03	b.	SW Pump Breaker Indication	1 per pump	E
DOC M03	c.	SW Pump Amp Indication	1 per pump	E

3

INSERT 3

DOC M03	19.	Steam Generator Level (Narrow Range)	2 per steam generator	E
DOC M03	20.	Refueling Water Storage Tank Level	2	E
	21.	Heat Removal by the Containment Fan Coil Units (Service Water Supply Valve Position Indication)	4	E

Insert Page 3.3.3-3

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

1. ISTS 5.6.5, "Post Accident Monitoring Report" is numbered ITS 5.6.4 as a result of not including ISTS 5.6.4 in the Kewaunee Power Station (KPS) ITS. As a result, Specification 5.6.5 is now Specification 5.6.4 in the applicable Required Actions of ITS 3.3.3.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. 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. The Functions listed in ITS Table 3.3.3-1 have been modified to be consistent with the Kewaunee RG 1.97 requirements, as required by the Reviewer's Note to the Table.

4. An additional CHANNEL CALIBRATION Surveillance Requirement (ITS SR 3.3.3.2) has been added consistent with the current licensing basis (CTS Table TS 4.1-1 Channel Description 16) for performing the calibration of the Refueling Water Storage Tank (RWST) Level on an annual Frequency (i.e., 12 months). The subsequent Surveillance Requirement (ISTS 3.3.3.2) has been renumbered and revised as a result of the addition of the new Surveillance Requirement for the RWST Level. The Note to the Surveillance Requirements has been modified to reflect the change in the Surveillance Requirement numbering.

5. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

6. ISTS 3.3.3 Condition C states "One or more Functions with two required channels inoperable" and ISTS 3.3.3 Required Action C.1 states "Restore one channel to OPERABLE status." This ISTS ACTION is intended to cover the condition when all required channels of a Function are inoperable. It also assumes that each Function has only two channels. ITS Table 3.3.3-1 Functions 13, 14, and 21 have more than two required channels. Therefore, for consistency with the ISTS requirements, ITS 3.3.3 Condition C has been changed to cover the Condition of "two or more" required channels inoperable and ITS 3.3.3 Required Action C.1 has been changed to require restoring "all but one" channel to OPERABLE status. This ensures the intent of the ISTS is maintained. In addition, the word "required" has also been added to the Required Action to be consistent with the words in the Condition (which specify "required" channels).

7. The allowance to not shut down the unit provided in ISTS 3.3.3 ACTION F has not been adopted in the KPS ITS for ITS Table 3.3.3-1 Functions 6 and 10. When all required channels of PAM Functions 6 or 10 are inoperable and at least one channel is not restored within the requirements of ITS 3.3.3 ACTION C, a shutdown will be required in accordance with ITS 3.3.3 ACTION E. This is consistent with current licensing basis (CTS Table TS 3.5-6 Footnote (1)) for Function 6. ITS Table 3.3.3-1 Function 10 is a new Function and viable alternate means have not been developed or tested for Containment Area Radiation.

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

B 3.3 INSTRUMENTATION

B 3.3.3 Post Accident Monitoring (PAM) Instrumentation

BASES

BACKGROUND

The primary purpose of the PAM instrumentation is to display unit variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for Design Basis Accidents (DBAs).

The OPERABILITY of the accident monitoring instrumentation ensures that there is sufficient information available on selected unit parameters to monitor and to assess unit status and behavior following an accident.

The availability of accident monitoring 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 by unit specific documents (Ref. 1) addressing the recommendations of Regulatory Guide 1.97 (Ref. 2) as required by Supplement 1 to NUREG-0737 (Ref. 3).

The instrument channels required to be OPERABLE by this LCO include two classes of parameters identified during unit specific implementation of Regulatory Guide 1.97 as Type A and Category ~~I~~ 1 variables. 1

~~Type A variables are included in this LCO because they provide the primary information required for the control room operator to take specific manually controlled actions for which no automatic control is provided, and that are required for safety systems to accomplish their safety functions for DBAs. Because the list of Type A variables differs widely between units, Table 3.3.3-1 in the accompanying LCO contains no examples of Type A variables, except for those that may also be Category I variables.~~ 2

~~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,~~ 2
- ~~Provide information to the operators that will enable them to determine the likelihood of a gross breach of the barriers to radioactivity release, and~~

BASES

BACKGROUND (continued)

- 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 to estimate the magnitude of any impending threat. 2

These key variables are identified by the unit specific Regulatory Guide 1.97 analyses (Ref. 1). These analyses identify the unit specific Type A and Category I variables and provide justification for deviating from the NRC proposed list of Category I variables guidance in Reference 2 1 3

------------------------------------REVIEWER'S NOTE------------------------------------
Table 3.3.3-1 provides a list of variables typical of those identified by the unit specific Regulatory Guide 1.97 analyses. Table 3.3.3-1 in unit specific Technical Specifications (TS) shall list all Type A and Category I variables identified by the unit specific Regulatory Guide 1.97 analyses, as amended by the NRC's Safety Evaluation Report (SER). 4

The specific instrument Functions listed in Table 3.3.3-1 are discussed in the LCO section.

APPLICABLE SAFETY ANALYSES

LCO OPERABILITY

The PAM instrumentation ensures the operability of Regulatory Guide 1.97 Type A and Category I variables so that the control room operating staff can: 5 6 1

1

- Perform the diagnosis specified in the emergency operating procedures (these variables are restricted to preplanned actions for the primary success path of DBAs), e.g., loss of coolant accident (LOCA), ; and 2
- Take the specified, pre-planned, manually controlled actions, for which no automatic control is provided, and that are required for safety systems to accomplish their safety function, . 2
- Determine whether systems important to safety are performing their intended functions, ; 7
- Determine the likelihood of a gross breach of the barriers to radioactivity release, ; 7
- Determine if a gross breach of a barrier has occurred, and ; 7

The PAM Instrumentation LCO also ensures the OPERABILITY of Category 1, non-Type A, variables so the control room staff can: 3

BASES

APPLICABLE SAFETY ANALYSES (continued)

- Initiate action necessary to protect the public and to estimate the magnitude of any impending threat.

PAM instrumentation that meets the definition of Type A in Regulatory Guide 1.97 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Category ~~I~~ 1, 1
non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category ~~I~~ 1, non-Type A, variables are important for reducing public risk. 1

LCO

The PAM instrumentation LCO provides OPERABILITY requirements for Regulatory Guide 1.97 Type A monitors, which provide information required by the control room operators to perform certain manual actions specified in the unit Emergency Operating Procedures. These manual actions ensure that a system can accomplish its safety function, and are credited in the safety analyses. Additionally, this LCO addresses Regulatory Guide 1.97 instruments that have been designated Category ~~I~~ 1 1
non-Type A.

The OPERABILITY of the PAM instrumentation ensures there is sufficient information available on selected unit parameters to monitor and assess unit status following an accident. This capability is consistent with the recommendations of Reference 1.

LCO 3.3.3 requires two OPERABLE channels for most Functions. Two OPERABLE channels ensure no single failure prevents operators from getting the information necessary for them to determine the safety status of the unit, and to bring the unit to and maintain it in a safe condition following an accident.

Furthermore, OPERABILITY 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 unit specific Regulatory Guide 1.97 analyses (Ref. 1) determined that failure of one accident monitoring channel results in information ambiguity (that is, the redundant displays disagree) that could lead operators to defeat or fail to accomplish a required safety function.~~ 3

One ~~The~~ exception to the two channel requirement is Penetration Flow Path Containment Isolation Valve (CIV) Position. In this case, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active CIV. 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 a passive 3

All changes are 3 unless otherwise noted

BASES

LCO (continued)

valve, or via system boundary status. If a normally active CIV 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.

~~Table 3.3.3-1 provides a list of variables typical of those identified by the unit specific Regulatory Guide 1.97 (Ref. 1) analyses. Table 3.3.3-1 in unit specific TS should list all Type A and Category I variables identified by the unit specific Regulatory Guide 1.97 analyses, as amended by the NRC's SER.~~

1 Type A and Category ~~I~~ 1 variables are required to meet Regulatory Guide 1.97 Category ~~I~~ 1 (Ref. 2) design and qualification requirements for seismic and environmental qualification, single failure criterion, utilization of emergency standby power, immediately accessible display, continuous readout, and recording of display, except for approved deviations, as described in Reference 1. 1

Listed below are discussions of the specified instrument Functions listed in Table 3.3.3-1. ~~These discussions are intended as examples of what should be provided for each Function when the unit specific list is prepared.~~

1~~, 2~~. ~~Power Range and Source~~ Intermediate Range Neutron Flux

~~Power Range and Source~~ Intermediate Range Neutron Flux indication, a non-Type A, Category 1 variable, is provided to verify reactor shutdown. The ~~two ranges are necessary to cover~~ intermediate range covers the full range of flux that may occur post accident.

Neutron flux is used for accident diagnosis, verification of subcriticality, and diagnosis of positive reactivity insertion.

INSERT 1

3, 4. Reactor Coolant System (RCS) Hot and Cold Leg Temperatures

RCS Hot and Cold Leg Temperatures are non-Type A, Category ~~I~~ 1 variables provided for verification of core cooling and long term surveillance. 1

RCS hot and cold leg temperatures are used to determine RCS subcooling margin. ~~RCS subcooling margin will allow termination of safety injection (SI), if still in progress, or reinitiation of SI if it has been stopped. RCS subcooling margin is also used for unit stabilization and cooldown control.~~

3 5 **INSERT 1**

2. Steam Generator Pressure

Steam Generator Pressure is a Type A, Category 1 variable provided for isolation of a faulted steam generator. Three steam generator pressure channels per steam generator are provided; however only two channels per steam generator are required to be OPERABLE. The two required channels for each steam generator must be powered from separate power supplies. Each channel has a range of 0 psig to 1400 psig. Each steam generator is treated separately and each steam generator is considered a separate Function. Therefore, a separate Condition entry is allowed for each steam generator. This is acceptable since each steam generator has two required channels and the channels of one steam generator are independent from the channels of the other steam generator.

All changes are 3 unless otherwise noted

LCO (continued)

RCS hot and cold leg temperature is also used for unit stabilization and cooldown control.

In addition, RCS cold leg temperature is used in conjunction with RCS hot leg temperature to verify the unit conditions necessary to establish natural circulation in the RCS.

INSERT 2

~~Reactor outlet temperature inputs to the Reactor Protection System are provided by two fast response resistance elements and associated transmitters in each loop.~~ The channels provide indication over a range of ~~32~~ 50°F to 700°F.

5. Reactor Coolant System (RCS) Pressure (Wide Range)

RCS wide range pressure is a Type A, Category ~~I~~ 1 variable provided for verification of core cooling and RCS integrity long term surveillance. 1

RCS pressure is used to verify delivery of SI flow to RCS from at least one train when the RCS pressure is below the pump shutoff head. RCS pressure is also used to ~~verify closure of manually closed spray line valves and pressurizer power operated relief valves (PORVs)~~ select low or high head safety injection.

In addition to these verifications, RCS pressure is used for determining RCS subcooling margin. RCS subcooling margin will allow termination of SI, if still in progress, or reinitiation of SI if it has been stopped. RCS pressure can also be used:

- to determine whether to terminate actuated SI or to reinitiate stopped SI~~,~~;
- to determine when to reset SI and shut off low head SI (RHR)~~,~~;
- to manually restart low head SI~~,~~;
- as reactor coolant pump (RCP) trip criteria~~,~~; and
- to make a determination on the nature of the accident in progress and where to go next in the procedure.

RCS subcooling margin is also used for unit stabilization and cooldown control.

3

INSERT 2

The RCS hot leg and cold leg channels each receive input from one resistance temperature detector (RTD). There are two loops (A and B) with one RCS hot leg RTD and one RCS cold leg RTD from each loop that satisfies the guidance of Reference 2.

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All changes are 3 unless otherwise noted

LCO (continued)

~~RCS pressure is also related to three decisions about depressurization. They are:~~

- ~~to determine whether to proceed with primary system depressurization,~~
- ~~to verify termination of depressurization, and~~
- ~~to determine whether to close accumulator isolation valves during a controlled cooldown/depressurization.~~

A final use of RCS pressure is to determine whether to operate the pressurizer heaters.

~~In some units,~~ RCS pressure is a Type A, Category 1 variable because the operator uses this indication to monitor the cooldown of the RCS following a steam generator tube rupture (SGTR) or small break LOCA. Operator actions to maintain a controlled cooldown, such as adjusting steam generator (SG) pressure or level, would use this indication. Furthermore, RCS pressure is one factor that may be used in decisions to terminate RCP operation. Two wide range pressure transmitters are located in the loop "A" hot leg, each with a range of 0 psig to 3000 psig.

6. Coolant Inventory (Reactor Vessel ~~Water~~ Level Indicating System)

Coolant Inventory ~~Reactor Vessel Water Level~~ is a non-Type A, Category 1 variable provided for verification and long term surveillance of core cooling. It is also used for accident diagnosis and to determine reactor coolant inventory adequacy.

The Reactor Vessel ~~Water~~ Level ~~Monitoring~~ Indicating System provides a direct measurement of the collapsed liquid level ~~above the fuel alignment plate~~ in the reactor vessel as measured from the bottom of the hot leg to the top of the reactor vessel head. 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.

Redundant monitoring is provided by four channels of Coolant Inventory (Reactor Vessel Level Indicating System), two channels for when the Reactor Coolant Pumps (RCPs) are on and two channels for when the RCPs are off. Each channel consists of a transmitter and an indicator.

7. Containment Sump Water Level (Wide Range)

Containment Sump Water Level is a non-Type A, Category 1 variable provided for verification and long term surveillance of RCS integrity.

Containment Sump Water Level is used to determine:

- containment sump level accident diagnosis, and

All changes are 3 unless otherwise noted

LCO (continued)

- when to begin the recirculation procedure~~, and~~ .
- ~~whether to terminate SI, if still in progress.~~ INSERT 3

8. Containment Pressure (Wide Range)

Containment Pressure (Wide Range) is a non-Type A, Category 1 variable provided for verification of RCS and containment OPERABILITY.

INSERT 4

~~Containment pressure is used to verify closure of main steam isolation valves (MSIVs), and containment spray Phase B isolation when High-3 containment pressure is reached.~~

9. Penetration Flow Path Containment Isolation Valve (CIV) Position

Penetration Flow Path CIV Position is a non-Type A, Category 1 variable provided for verification of Containment OPERABILITY, and ~~Phase A and Phase B~~ containment isolation.

In the case of CIV position ~~When used to verify Phase A and Phase B isolation~~, the important information is the isolation status of the containment penetrations. 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 either via indicated status of the active valve, as applicable, and prior knowledge of a passive valve, or via system boundary status. If a normally active CIV 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. Note (a) to the Required Channels states that the Function is not required for isolation valves whose associated 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. 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.

3 **INSERT 3**

Two containment sump (wide range) water level channels are provided with each channel having a range of 0 to 22 feet.

3 **INSERT 4**

Two containment pressure channels are provided with each channel having a range of -5 psig to 200 psig. The containment pressure monitoring system allows operations personnel to adequately assess containment pressure under both normal and post LOCA operating conditions.

All changes are 3 unless otherwise noted

BASES

LCO (continued)

10. Containment Area Radiation (High Range)

(High Range) a non-Type A, Category 1 variable

Containment Area Radiation is 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. Containment radiation level is used to determine if a ~~high energy line break (HELB)~~ has occurred~~, and whether the event is inside or outside of containment~~.

Loss of Coolant Accident (LOCA)

INSERT 5

11. Pressurizer Level

a non-Type A, Category 1 variable

Pressurizer Level is used to determine whether to terminate 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 unit conditions necessary to establish natural circulation in the RCS and to verify that the unit is maintained in a safe shutdown condition.

INSERT 6

(SG)

12. Steam Generator Water Level (Wide Range)

non-Type A,

SG Water Level is provided to monitor operation of decay heat removal via the SGs. The Category ~~I~~ indication of SG level is the 1 ~~extended startup~~ range level instrumentation. The ~~extended startup~~ range level covers a span of ~~≥ 6 inches to ≤ 394 inches~~ above the lower tubesheet. ~~The measured differential pressure is displayed in inches of water at 68°F.~~ 1

wide wide 0% to 100%

INSERT 7

~~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 unit computer,~~ a control room indicator, ~~and the Emergency Feedwater Control System~~.

an indicator on the dedicated shutdown panel, and an alarm module that feeds an annunciator

SG Water Level (Wide Range) is used to:

- identify the faulted SG following a tube rupture~~,~~ ; 7
- verify that the intact SGs are an adequate heat sink for the reactor~~,~~ ; 7
- determine the nature of the accident in progress (e.g., verify an SGTR)~~,~~ ; and 7
- verify unit conditions for termination of SI ~~during secondary unit HELBs outside containment~~.

3 **INSERT 5**

Two containment radiation (high range) channels are provided with each channel having a range of 1 R/hr to 10E8 R/hr.

3 **INSERT 6**

Three pressurizer level channels are provided with each channel having a range of 0% to 100% between the top of the heaters and 23 inches below the pressure operated relief valve (PORV) connection. However, only two of the channels are required to be OPERABLE, but the two channels must be powered from separate power supplies.

3 **INSERT 7**

Four steam generator (wide range) water level channels (two per steam generator) are provided with each channel having a range of 0% to 100%.

All changes are 3 unless otherwise noted

BASES

LCO (continued)

~~At some units,~~ operator action is based on the control room indication of SG level. The RCS response during a design basis small break LOCA depends on the break size. For a certain range of break sizes, the boiler condenser mode of heat transfer is necessary to remove decay heat. Extended startup range level is a Type A variable because the The operator must manually raise and control SG level to ensure decay heat removal. establish 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 boiler condenser setpoint.

13. ~~Condensate Storage Tank (CST) Level~~ Auxiliary Feedwater (AFW) Service Water (SW) Supply

~~CST Level~~ AFW SW Supply is a non-Type A, Category 1 variable provided to ensure water supply for ~~auxiliary feedwater (AFW)~~. The CST provides the ~~ensured safety grade~~ preferred 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 inch to 144 inch level indication for each tank. CST Level is displayed on a control room indicator, strip chart recorder, and unit computer. In addition, a control room annunciator alarms on low level.~~

INSERT 8

~~At some units, 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.~~

14, 15, 16, 17. Core Exit Temperature

Core Exit Temperature is a non-Type A, Category 1 variable provided for verification and long term surveillance of core cooling. In addition, core exit temperature is used for determining RCS subcooling margin.

~~An evaluation was made of the minimum number of valid core exit thermocouples (CET) necessary for measuring core cooling. The evaluation determined the reduced complement of CETs necessary to detect initial core recovery and trend the ensuing core heatup. The evaluations account for core nonuniformities, including incore effects of the radial decay power distribution, excore effects of condensate runback in the hot legs, and nonuniform inlet~~

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3 **INSERT 8**

There are three sub-functions used for monitoring the AFW SW Supply variable: 1) SW supply valve to AFW pump; 2) SW pump breaker indication; and, 3) SW pump amp indication. The first sub-function utilizes a total of three SW supply valves to the three AFW pumps, one valve for each pump. The position indications for the SW supply valves to the AFW pumps provide acceptable indication for the AFW SW Supply level variable. All three channels are required to satisfy the guidance in Reference 2. The second sub-function provides an indication of the SW pump breaker status; however, the position indication of the breaker does not necessarily indicate that the applicable SW pump is running. One channel per pump is required to satisfy the guidance in Reference 2. The third sub-function utilizes an ampere indicator for each SW pump to provide the status of the pump (i.e., running or stopped). One channel per pump is required to satisfy the guidance in Reference 2.

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All changes are 3 unless otherwise noted

BASES

LCO (continued)

temperatures. Based on these evaluations, adequate core cooling is ensured with two valid Core Exit Temperature channels per quadrant with two CETs per required channel. The CET pair are oriented radially to permit evaluation of core radial decay power distribution. Core Exit Temperature is used to determine whether to terminate SI, if still in progress, or to reinitiate SI if it has been stopped. Core Exit Temperature is also used for unit stabilization and cooldown control.

Four

~~Two~~ OPERABLE channels of Core Exit Temperature are required 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 are not 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 is located near the center of the core and the other near the core perimeter, such that the pair of Core Exit Temperatures indicate the radial temperature gradient across their core quadrant. Unit specific evaluations in response to Item II.F.2 of NUREG-0737 (Ref. 3) should have identified the thermocouple pairings that satisfy these requirements. Two sets of two thermocouples ensure a single failure will not disable the ability to determine the radial temperature gradient.

Each core exit temperature channel has a range of 0°F to 2300°F. Furthermore, thermocouples on the axis may be included in either adjacent quadrant.

18. Auxiliary Feedwater Flow

AFW Flow is provided to monitor operation of decay heat removal via the SGs.

The AFW Flow to each SG is determined from a differential pressure measurement calibrated for a range of 0 gpm to 1200 gpm. Redundant monitoring capability is provided by two independent trains of instrumentation for each SG. Each differential pressure transmitter provides an input to a control room indicator and the unit computer. Since the primary indication used by the operator during an accident is the control room indicator, the PAM specification deals specifically with this portion of the instrument channel.

AFW flow is used three ways:

- to verify delivery of AFW flow to the SGs,
- to determine whether to terminate SI if still in progress, in conjunction with SG water level (narrow range), and

INSERT 9

3 **INSERT 9**

18. Reactor Coolant System (RCS) Sub-Cooling Margin Monitor

RCS Sub-Cooling Margin Monitor, which is part of the Inadequate Core Cooling Monitoring System (ICCMS), is a Type A, Category 1 variable provided for the determination of when to manually trip the reactor coolant pumps. The Sub-Cooling Margin Monitor provides the operator with a continuous indication of the thermal-hydraulic state within the reactor vessel during the progression of an event leading to and from inadequate core cooling. The Sub-Cooling Margin Monitor provides a calculated value displayed in the control room. The Sub-Cooling Margin Monitor is an on-line microcomputer-based system using RCS process signals and steam tables to calculate a continuous indication of either the pressure or temperature margin from saturation depending on the parameter selected with the control switch. Temperature margin is the difference between the measured RCS temperature and saturation temperature. Pressure margin is the difference between measured RCS pressure and saturation pressure. The RCS process signals for both temperature margin and pressure margin are core exit temperature (average of 10 highest), RCS pressure (RCS hot leg pressure), and pressurizer pressure (lowest of pressure inputs P429 and P430).

19. Steam Generator (SG) Level (Narrow Range)

Steam Generator Level (Narrow Range) is a Type A, Category 1 variable provided for identification of a ruptured steam generator and for manually controlling AFW flow to ensure an adequate heat sink. Three narrow range level channels per steam generator are provided; however only two channels per steam generator are required to be OPERABLE. The two channels required for each steam generator must be powered from separate power supplies. Each channel has a range of 0% to 100% level. Each steam generator is treated separately and each steam generator is considered a separate Function. Therefore, separate Condition entry is allowed for each steam generator. This is acceptable since each steam generator has three channels and the channels of one steam generator are independent from the channels of the other steam generator.

20. Refueling Water Storage Tank Level

Refueling Water Storage Tank Level is a Type A, Category 1 variable provided for determination of when to manually transfer the safety injection pump suction from the Refueling Water Storage Tank to the containment sump, based on low Refueling Water Storage Tank level. Two refueling water storage tank water level channels are provided with each channel having a range of 0% to 100% of tank volume.

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3

INSERT 9 (continued)

21. Heat Removal by the Containment Fan Coil Units System (Service Water Supply Valve Position Indication)

    Heat Removal by the Containment Fan Coil Units System (Service Water Supply Valve Position Indication) is a non-Type A, Category 1 variable provided for monitoring the operation of the containment cooling system. There are a total of four service water supply valves to the four containment fan coil units, with one valve for each of the containment fan coil units. The position indication for each valve is required to be OPERABLE.

BASES

LCO (continued)

- to regulate AFW flow so that the SG tubes remain covered.

At some units, AFW flow is a Type A variable because operator action is required to throttle flow during an SLB accident 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 SG. However, the primary indication used by the operator to ensure an adequate inventory is SG level. 3

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and pre-planned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, unit conditions are such that the likelihood of an event that would require PAM instrumentation is low; therefore, the PAM instrumentation is not required to be OPERABLE in these MODES.

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 on Table 3.3.3-1. 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.

A.1

Condition A applies when one or more Functions have one required channel that is inoperable. Required Action A.1 requires restoring the inoperable channel 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.

BASES

ACTIONS (continued)

B.1

immediate 3

Condition B applies when the Required Action and associated Completion Time for Condition A are not met. This Required Action specifies initiation of actions in Specification 5.6.~~5~~, 4 5 which requires a written report to be submitted to the NRC ~~immediately~~. This report discusses the results of within 14 days 3 the ~~root~~ cause ~~evaluation~~ of the inoperability and identifies proposed restorative actions. This action is appropriate in lieu of a shutdown requirement since alternative actions are identified before loss of functional capability, and given the likelihood of unit conditions that would require information provided by this instrumentation.

C.1

or more

Condition C applies when one or more Functions have two inoperable required channels (i.e., two channels inoperable in the same Function). required Required Action C.1 requires restoring one channel in the Function(s) to OPERABLE status within 7 days. all but The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels or more inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of all but one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur. 5

D.1

Condition D applies when the Required Action and associated Completion Time of Condition C is not met. Required Action D.1 requires entering the appropriate Condition referenced in Table 3.3.3-1 for the channel immediately. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met the Required Action of Condition C, and the associated Completion Time has expired, Condition D is entered for that channel and provides for transfer to the appropriate subsequent Condition.

BASES

ACTIONS (continued)

E.1 and E.2

If the Required Action and associated Completion Time of Condition C is not met and Table 3.3.3-1 directs entry into Condition E, the unit must be brought to a MODE where the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

~~F.1~~

~~At this unit, 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 unit but rather to follow the directions of Specification 5.6.5, in the Administrative Controls section of the TS. 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.~~ 5

SURVEILLANCE REQUIREMENTS

~~A Note has been added to the SR Table to clarify that SR 3.3.3.1 and SR 3.3.3.3~~ apply to each PAM instrumentation Function in Table 3.3.3-1. 5

As noted at the beginning of the SRs, the following SRs

, except where identified in the SR

SR 3.3.3.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross instrumentation failure 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. The ~~high radiation~~ instrumentation should be compared to similar unit instruments located throughout the unit. 3

Containment Area Radiation (High Range)

All changes are 3 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the unit 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 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.

As specified in the SR, a CHANNEL CHECK is only required for those channels that are normally energized.

The Frequency of 31 days is based on operating experience that demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.3.2 and SR 3.3.3.3

A CHANNEL CALIBRATION is performed every 12 months for Function 20, every ~~[~~18~~]~~ months for all other Functions, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. ~~This~~ SR 3.3.3.3 is modified by a Note that excludes neutron detectors. The calibration method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor ~~Trip~~ Protection System (R~~T~~PS) Instrumentation." 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~~ Both the 12 month and 18 month Frequencies are based on operating experience and ~~consistency~~ the 18 month Frequency is consistent with the typical industry refueling cycle.

REFERENCES

~~[1. Unit specific document (e.g., FSAR, NRC Regulatory Guide 1.97 SER letter).]~~ KW-PLAN-000-RG 1.97, Revision 15. 8

2. Regulatory Guide 1.97, ~~[date]~~ Revision 3, May 1983. 8

3. NUREG-0737, Supplement 1, ~~"TMI Action Items."~~ "Clarification of TMI Action Plan Requirements." 6

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3 BASES, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

1. Typographical error corrected.

2. The Background section of the ISTS 3.3.3 Bases contains information that describes the Type A variables and Category 1 variables. This same descriptive information is effectively duplicated in the Applicable Safety Analyses section of the ISTS 3.3.3 Bases. Therefore, the duplicate descriptive information in the Background section of the Bases is deleted. In addition, the description of these variables in the LCO section of the ISTS 3.3.3 Bases has been modified to clearly identify which functions are provided by Type A variables and which functions are provided by Category 1, non-Type A, variables.

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

4. The Reviewer's Note has been deleted. The information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

5. Changes are made to reflect changes made to the Specification.

6. Grammatical/editorial error corrected.

7. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

8. The ISTS Bases contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 4

ITS 3.3.4, DEDICATED SHUTDOWN SYSTEM

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

ITS 3.3.4

Add proposed ITS 3.3.4

M01

DISCUSSION OF CHANGES
ITS 3.3.4, DEDICATED SHUTDOWN SYSTEM

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

M01 The CTS does not contain any requirements for the Dedicated Shutdown System to be OPERABLE. ITS 3.3.4 requires the Dedicated Shutdown System Functions to be OPERABLE in MODES 1, 2, and 3. The ITS also provides ACTIONS (ACTIONS A and B) when the LCO is not met and Surveillance Requirements (ITS SR 3.3.4.1, SR 3.3.4.2, and SR 3.3.4.3) to verify the Dedicated Shutdown System Functions are OPERABLE. This changes the CTS by incorporating the requirements of ITS 3.3.4.

The function of the Dedicated Shutdown System is to provide 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 should the control room become inaccessible. This change is designated as more restrictive because it adds new requirements to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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

3.3 INSTRUMENTATION

3.3.4 ~~Remote~~ Dedicated Shutdown System 1

DOC M01 LCO 3.3.4 The ~~Remote~~ Dedicated Shutdown System Functions shall be OPERABLE.

DOC M01 APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M01	A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days
DOC M01	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
DOC M01	SR 3.3.4.1	~~[~~ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days ~~]~~	2
DOC M01	SR 3.3.4.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	~~[~~18~~]~~ months	2

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M01	SR 3.3.4.3	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~[~~18~~]~~ months	2
	~~SR 3.3.4.4~~	~~[Perform TADOT of the reactor trip breaker open/closed indication.~~	~~18 months]~~	3

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4, DEDICATED 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 or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. USAR, Section 7.7.6.1 provides multiple methods to trip the reactor if the control room is evacuated prior to tripping the reactor. These methods include opening the reactor trip breakers, opening the rod power supply breakers, and actuating the manual turbine trip on the turbine. Plant procedures govern these methods and do not need to be included in this Specification. Therefore, a specific Surveillance on one of the methods (reactor trip breakers) has not been added, consistent with the CTS.

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

All changes are 1 unless otherwise noted

B 3.3 INSTRUMENTATION

B 3.3.4 Dedicated ~~Remote~~ Shutdown System

BASES

BACKGROUND

The Dedicated ~~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 (SG) safety valves~~ Steam Dump System or the Steam Generator (SG) ~~SG~~ power operated relief valves (PORVs) ~~atmospheric dump valves (ADVs)~~ 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 allows extended operation in MODE 3.

If the control room becomes inaccessible, the operators can establish control at the dedicated ~~remote~~ shutdown panel, and place and maintain the unit in MODE 3. Not all controls and necessary transfer switches are located at the dedicated ~~remote~~ shutdown panel. Some controls and transfer switches will have to 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 Dedicated ~~remote~~ S ~~s~~hutdown System control and instrumentation functions ensures there is sufficient information available on selected unit parameters to place and maintain the unit in MODE 3 should the control room become inaccessible.

APPLICABLE SAFETY ANALYSES

The Dedicated ~~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 unit in a safe condition in MODE 3.

The criteria governing the design and specific system requirements of the Dedicated ~~Remote~~ Shutdown System are located in USAR, Section 7.7.6 ~~10 CFR 50, Appendix A, GDC 19~~ (Ref. 1).

The Dedicated ~~Remote~~ Shutdown System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

All changes are 1 unless otherwise noted

Dedicated ~~Remote~~ Shutdown System
B 3.3.4

BASES

LCO

Dedicated
The ~~Remote~~ Shutdown System LCO provides the OPERABILITY requirements 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 3.3.4-1.

The controls, instrumentation, and transfer switches are required for:

- Core reactivity control (initial and long term)~~,~~ ;
- RCS pressure control~~,~~ ;
- Decay heat removal via the AFW System and the ~~SG safety valves~~ Steam Dump System or SG ~~ADVs~~ PORVs~~,~~ ;
- RCS inventory control via charging flow~~,~~ ; and
- Safety support systems for the above Functions, including service water, component cooling water, and onsite power, including the diesel generators.

A Function of a Dedicated ~~Remote~~ Shutdown System is OPERABLE if all instrument s and control channels ~~needed to support the Remote Shutdown System~~ for the Function are OPERABLE. ~~In some cases, Table B 3.3.4-1 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 is OPERABLE.~~

The dedicated ~~remote~~ shutdown instrument and control circuits covered by this LCO do not need to be energized to be considered OPERABLE. This LCO is intended to ensure the instruments and control circuits will be OPERABLE if unit conditions require that the Dedicated ~~Remote~~ Shutdown System be placed in operation.

APPLICABILITY

Dedicated
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 facility is already subcritical and in a condition of reduced RCS energy. Under these conditions, considerable time is available to restore necessary instrument control functions if control room instruments or controls become unavailable.

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All changes are 1 unless otherwise noted

BASES

indication or control Function

Dedicated

ACTIONS

Dedicated A ~~Remote~~ Shutdown System ~~division~~ is inoperable when each function is not accomplished by at least one designated ~~Remote~~ Shutdown System channel that satisfies the OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases.

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. Separate Condition entry is allowed 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

Dedicated

Condition A addresses the situation where one or more 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 required Function 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 is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit 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 unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

Performance of the CHANNEL CHECK once every 31 days 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 that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

All changes are 1 unless otherwise noted

BASES

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the unit 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. 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 which are normally energized.

The Frequency of 31 days is based upon operating experience which demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.4.2

SR 3.3.4.2 verifies each required Dedicated ~~Remote~~ Shutdown System control circuit and transfer switch performs the intended function. This verification is performed from the dedicated ~~remote~~ shutdown panel and locally, as appropriate. Operation of the equipment from the dedicated ~~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 unit can be placed and maintained in MODE 3 from the dedicated ~~remote~~ 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 unplanned transient if the Surveillance were performed with the reactor at power. (However, this Surveillance is not required to be performed only during a unit outage.) Operating experience demonstrates that dedicated ~~remote~~ shutdown control channels usually pass the Surveillance test when performed at the ~~[~~18~~]~~ month Frequency. 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a 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 Frequency of ~~[~~18~~]~~ months is based upon operating experience and consistency with the typical industry refueling cycle. 2

~~[SR 3.3.4.4~~

~~SR 3.3.4.4 is the performance of a TADOT every 18 months. This test should verify the OPERABILITY of the reactor trip breakers (RTBs) open and closed indication on the remote shutdown panel, by actuating the RTBs. 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 TADOT 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 based upon operating experience and consistency with the typical industry refueling outage.]~~ 4

REFERENCES 1. ~~10 CFR 50, Appendix A, GDC 19~~ USAR, Section 7.7.6. 1

1

Table B 3.3.4-1 (page 1 of 1)
Dedicated ~~Remote~~ Shutdown System Instrumentation and Controls

1

INSERT 1

3

FUNCTION/~~INSTRUMENT~~ INDICATION OR CONTROL PARAMETER	REQUIRED NUMBER OF FUNCTIONS
~~1. Reactivity Control~~	
~~a. Source Range Neutron Flux~~	~~[1]~~
~~b. Reactor Trip Breaker Position~~	~~[1 per trip breaker]~~
~~c. Manual Reactor Trip~~	~~[2]~~
~~2. Reactor Coolant System (RCS) Pressure Control~~	
~~a. Pressurizer Pressure or RCS Wide Range Pressure~~	~~[1]~~
~~b. Pressurizer Power Operated Relief Valve (PORV) Control and Block Valve Control~~	~~[1, controls must be for PORV & block valves on same line]~~
~~3. Decay Heat Removal via Steam Generators (SGs)~~	
~~a. RCS Hot Leg Temperature~~	~~[1 per loop]~~
~~b. RCS Cold Leg Temperature~~	~~[1 per loop]~~
~~c. AFW Controls Condensate Storage Tank Level~~	~~[1]~~
~~d. SG Pressure~~	~~[1 per SG]~~
~~4. RCS Inventory Control~~	
~~a. Pressurizer Level~~	~~[1]~~
~~b. Charging Pump Controls~~	~~[1]~~

~~---REVIEWER'S NOTE---~~
~~For channels that fulfill GDC 19 requirements, the number of OPERABLE channels required depends upon the unit licensing basis as described in the NRC unit specific Safety Evaluation Report (SER). Generally, two divisions are required OPERABLE. However, only one channel per a given Function is required if the unit has justified such a design, and NRC's SER accepted the justification.~~

3

~~---REVIEWER'S 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.~~

3

INSERT 1

1. Reactivity Control

    a. Source Range Neutron Flux Indication 1

2. RCS Pressure Control

    a. Reactor Coolant Pressurizer Pressure Indication 1

    b. Pressurizer Back-up Heater Group 1A Control 1

3. RCS Inventory Control

    a. Pressurizer Level Indication 1

    b. Refueling Water Storage Tank (RWST) Level Indication 1

    c. Charging Pump 1C Control 1

    d. RWST Emergency Makeup Level Control Valve Control 1

    e. Charging Line to Cold Leg B RCS Isolation Valve Control 1

4. Decay Heat Removal via SGs

    a. RCS Hot Leg A Temperature Indication 1

    b. RCS Cold Leg A Temperature Indication 1

    c. SG A Pressure Indication 1

    d. SG A Wide Range Level Indication 1

    e. Inservice Condensate Storage Tank Level Indication 1

    f. AFW Pump 1A Control 1

    g. SG A PORV Control 1

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4 BASES, DEDICATED 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 or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. As stated in the Reviewer's Note (2nd one), the ISTS Table B 3.3.4-1 is for illustration purposes only. The plant specific indications and controls have been added, consistent with USAR, Section 7.7.6.2. Furthermore, both Reviewer's Notes have been deleted. The information is to alert the NRC reviewer to what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

4. Changes made to be consistent with a change to the actual Specification. This bracketed Surveillance is not being maintained in the KPS ITS.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.4, DEDICATED SHUTDOWN SYSTEM

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 5

ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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

ITS

A01

ITS 3.3.5

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. LA02

Add proposed ACTIONS NOTE A02

LCO 3.3.5

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5.

ACTIONS A and B

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable.

Required Action A.1 Note 1

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip. See ITS 3.3.1, 3.3.2, and 3.3.6

e. The accident monitoring instrumentation in Table TS 3.5-6 shall be OPERABLE whenever the plant is above HOT SHUTDOWN. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes. A change in operational MODES or conditions is acceptable with an inoperable accident monitoring instrumentation channel(s). See ITS 3.3.3

ITS

ITS 3.3.5

A01

TABLE TS 3.5-1

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

See ITS 3.3.6

LA02

NO.	FUNCTIONAL UNIT	CHANNEL	SETTING LIMIT
8	Containment Purge and Vent System Radiation Particulate Detector Radioactive Gas Detector	Containment ventilation isolation	≤ value of radiation levels in exhaust duct as defined in footnote [3]
9	Safeguards Bus Undervoltage [4]	Loss of power	85.0% ± 2% nominal bus voltage ≤ 2.5 seconds time delay
10	Safeguards Bus Second Level Undervoltage [5]	Degraded grid voltage	93.6% ± 0.9% of nominal bus voltage ≤ 7.4 seconds time delay

LCO 3.3.5

LA01

LA02

[3] The setting limits for max radiation levels are derived from ODCM Specification 3.4.1 and Table 2.2, and USAR Section 6.5.

[4] This undervoltage protection channel ensures ESF equipment will perform as assumed in the USAR.

[5] This undervoltage protection channel protects ESF equipment from long-term low voltage operation.

See ITS 3.3.6

LA01

Amendment No. 131
01/06/97

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ITS

ITS 3.3.5

A01

TABLE TS 3.5-5

INSTRUMENT OPERATION CONDITIONS FOR SAFEGUARDS BUS POWER SUPPLY FUNCTIONS

LA03 LCO 3.3.5 A01

L01 Add proposed Required Actions A.1 and A.2 and ACTION B

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Safeguards Bus Undervoltage	2/bus(1)	1/bus	1/bus(2)	--		Maintain HOT SHUTDOWN or operate the diesel generator
2	Safeguards Bus Second Level Undervoltage	1/bus(3)	1/bus	-- 1/bus	--		When one of the two time-delay relays is out of service, place that relay in the tripped condition

LA04 M01

Required Action A.1, including Note 2

LCO 3.3.5

Add proposed Applicability M02

Add proposed Required Action A.2 and ACTION B M01

Required Action A.1, including Note 2

LA04

(1) Each channel consists of one instantaneous and one time-delayed relay connected in series.

(2) When one component of a channel is taken out of service, that component shall be in the tripped condition.

(3) Each channel consists of two time-delayed relays connected in series.

LA04

Page 1 of 1

Amendment No. 101
09/30/93

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4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SPECIFICATION

SR 3.3.5.1, SR 3.3.5.2

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3.

See other ITS

c. Deleted

d. Deleted

e. Deleted

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See ITS 3.3.1 and 3.3.2

See ITS 3.3.1

A03

TABLE TS 4.1-1 A01

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

SR 3.3.5.2 SR 3.3.5.1 TADOT

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
6. Pressurizer Water Level	Each shift	Each refueling cycle	Monthly	
7. Pressurizer Pressure	Each shift	Each refueling cycle	Monthly	
8. a. 4-KV Voltage and Frequency	Not applicable	Each refueling cycle	Monthly	Reactor protection circuits only
b. 4-KV Voltage (Loss of Voltage)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only
c. 4-KV Voltage (Degraded Grid)	Not applicable	Each refueling cycle	Monthly	Safeguards buses only
9. Analog Rod Position	Each shift(a,b)	Each refueling cycle	Each refueling cycle	(a) With step counters (b) Following rod motion in excess of 24 steps when computer is out of service
10. Rod Position Bank Counters	Each shift(a,b)	Not applicable	Each refueling cycle	(a) With analog rod position (b) Following rod motion in excess of 24 steps when computer is out of service

LCO 3.3.5

See ITS 3.1.4 and 3.1.7

See ITS 3.3.1

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5. Each diesel generator shall be operated for ≥ 24 hours every operating cycle:

   Note 1 Momentary transients outside the load and power factor ranges do not invalidate this test.

   Note 2 This Surveillance shall not normally be performed in the OPERATING or HOT STANDBY MODE. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this surveillance requirement.

   Note 3 If performed with the diesel generator synchronized with offsite power, it shall be performed at a power factor ≤ 0.89. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.

   A. For ≥ 2 hours loaded to 2860 KW (nominal) and,

   B. For the remaining hours of the test loaded to 2700 KW (nominal).

See ITS 3.8.1

SR 3.3.5.2

6. Safeguard bus undervoltage and safeguard bus second level undervoltage relays shall be calibrated at least once per operating cycle.

b. Station Batteries

1. The voltage of each cell shall be measured to the nearest hundredth volt each month. An equalizing charge shall be applied if the lowest cell in the battery falls < 2.13 volts. The temperature and specific gravity of a pilot cell in each battery shall be measured.

2. The following additional measurements shall be made quarterly: the specific gravity and height of electrolyte in every cell and the temperature of every fifth cell.

3. All measurements shall be recorded and compared with previous data to detect signs of deterioration.

4. The batteries shall be subjected to a load test during the first REFUELING and once every 5 years thereafter. Battery voltage shall be monitored as a function of time to establish that the battery performs as expected during heavy discharge and that all electrical connections are tight.

See ITS 3.8.6

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse 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 3.5.b, 3.5.c, and 3.5.d and Table TS 3.5-5 provide the compensatory actions to take when the Safeguards Bus Power Supply instrumentation is inoperable. ITS 3.3.5 ACTIONS provide the compensatory actions for inoperable LOOP DG start instrumentation. ITS 3.3.5 ACTIONS include a Note that allows a separate Condition entry for each Function. This modifies the CTS by providing a specific allowance to enter the Action for each inoperable LOOP DG Start Instrumentation Function.

This change is acceptable because it is consistent with the current requirement. The CTS considers each Safeguards Bus Power Supply Function to be separate and independent from the other. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS Table TS 4.1-1, Channel Descriptions 8.b and 8.c require that the 4-KV Voltage (Loss of Voltage) and 4-KV Voltage (Degraded Voltage) safeguards bus channels, respectively, be demonstrated OPERABLE by performance of a monthly TEST (i.e., a CHANNEL FUNCTIONAL TEST). ISTS SR 3.3.5.2 (ITS SR 3.3.5.1) requires the performance of a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT) once per 31 days. This changes the CTS by changing the CHANNEL FUNCTIONAL TEST requirements to a TADOT.

This change is acceptable because the TADOT continues to perform a test similar to the current CHANNEL TEST. The CHANNEL FUNCTIONAL TEST definition states to inject a simulated signal into the channel as close to the primary sensor as practicable to verify that it is OPERABLE, including alarm and/or trip initiating action. The ITS TADOT definition states to operate the trip actuating device and verify the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. For a loss of voltage or degraded voltage relay, the method to perform the required test in both cases is to inject a test voltage to the loss of voltage or degraded voltage relay and vary the voltage to check the setpoint of the relay. Thus, while the words in the two definitions are not exactly the same, the test is performed in the same manner. The ITS TADOT definition requires that the test include the adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. While the CTS CHANNEL FUNCTIONAL TEST definition does not include this requirement, the current method of testing the relays does record As Found and As Left voltage values. Lastly, the ITS TADOT definition states that the test may be performed by means of any series of sequential, overlapping, or total channel steps. Again, while this allowance is not

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

explicitly specified in the CTS CHANNEL FUNCTIONAL TEST definition, it is not precluded. Therefore, this testing method will be the same in the ITS as it is in the CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.5.c states, in part, that when the number of channels of a subsystem falls below the limits given in Table TS 3.5-5 Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-5 Functional Unit 2 (Safeguards Bus Second Level Undervoltage), Column 3 does not require any Safeguards Bus Second Level Undervoltage channels per bus to be OPERABLE and Column 4 has no minimum degree of redundancy specified. Thus, while there is one Safeguards Bus Second Level Undervoltage channel in the KPS design, the CTS allows the only Safeguards Bus Second Level Undervoltage channel to be inoperable for an indefinite amount of time without specifying any required actions. While Column 6 includes required actions, these actions are only required to be taken if Column 3 or 4 conditions cannot be met. ITS LCO 3.3.5 requires one Safeguards Bus Second Level Undervoltage (degraded voltage) channel per bus to be OPERABLE. ITS 3.3.5 ACTION A provides compensatory actions to take with one channel per bus inoperable and includes the CTS Column 6 requirement if the channel is inoperable due to one inoperable relay (see Required Action A.1, including Note 2). If both relays are inoperable or the channel is otherwise inoperable, Required Action A.2 states to restore the channel to OPERABLE status within 1 hour. If the requirements of ACTION A are not met, ITS 3.3.5 ACTION B requires immediately entering the applicable Condition and required Action for the associated DG made inoperable by LOOP DG start instrumentation. This changes the CTS by requiring one channel per bus of the Safeguards Bus Second Level Undervoltage Functional Unit to be OPERABLE, instead of zero channels per bus, and by adding specific ACTIONS to take when a channel is inoperable.

The purpose of this new ITS requirement and associated ACTIONS is to ensure that appropriate compensatory actions are taken if any of the Safeguard Bus Second Level Undervoltage (degraded voltage) channels are inoperable. This change is acceptable because the new requirement in ITS LCO 3.3.5 will ensure that sufficient channels are required to be OPERABLE to ensure the overall DG Function can be met if a degraded voltage condition exists. The proposed ITS ACTIONS for when one channel per bus is inoperable will ensure that the inoperable channel is not allowed to be inoperable or untripped without appropriate action being implemented within a reasonable time frame. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

M02 CTS 3.5 does not provide any specific Applicability for the LOOP DG Start Instrumentation. However, for CTS Table TS 3.5-5 Functional Unit 1, Safeguards Bus Undervoltage (loss of voltage), the Column 6 actions require the unit to be in HOT SHUTDOWN (ITS equivalent MODE 3) when the Column 3 or 4 conditions are not met. Thus, effectively the CTS Applicability is OPERATING and HOT STANDBY (ITS equivalent MODES 1 and 2). ITS 3.3.5 requires the LOOP DG Start Instrumentation to 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." This changes the CTS by adding additional Applicability conditions for the LOOP DG Start Instrumentation.

The purpose of the LOOP DG Start Instrumentation is to detect a sustained degraded voltage or a loss of bus voltage on the 4160 Safeguard buses. The required channels of the LOOP DG start instrumentation, in conjunction with the Engineered Safety Features (ESF) systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in the USAR, in which a loss of offsite power is assumed. This change is acceptable because operation in the identified ITS MODES is when the greatest potential exists for the need to have an emergency power supply available to power the ESF systems and the LOOP DG Start Instrumentation. This change is designated as more restrictive because new specific MODES of Applicability have been 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 Table TS 3.5-1 Footnote (4) to Functional Unit 9, Safeguards Bus Undervoltage, states this undervoltage protection channel ensures ESF equipment will perform as assumed in the USAR. CTS Table TS 3.5-1 Footnote (5) to Functional Unit 10, Safeguards Bus Second Level Undervoltage, states this undervoltage protection channel protects ESF equipment from long-term low voltage operation. ITS 3.3.5 does not contain this information. This changes the CTS by removing the details of the system design 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 to provide adequate protection of public health and safety. The ITS still retains the requirement for the LOOP DG Start Instrumentation to be OPERABLE and for the specific setpoints to be consistent with the Setpoint Control Program (ITS 5.5.16). 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

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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 3.5.a states setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. CTS Table TS 3.5-1 Functional Unit 9, Safeguards Bus Undervoltage, specifies a setting limit of 85.0% ± 2% nominal bus voltage and ≤ 2.5 seconds time delay for the associated channels. CTS Table TS 3.5-1 Functional Unit 10, Safeguards Bus Second Level Undervoltage, specifies a setting limit of 93.6% ± 0.9% of nominal bus voltage and ≤ 7.4 seconds time delay for the associated channels. ITS 3.3.5 does not contain this information. This changes the CTS by removing the setting limit information for the Safeguards Bus Undervoltage (loss of voltage) and Safeguards Bus Second Level Undervoltage (degraded voltage) channels and placing it in the KPS Setpoint Control Program (SCP) document.

The removal of these Setting Limit values from the Technical Specifications and the subsequent addition of the methodology that controls changes to the Setting Limit values to ITS 5.5.16 will provide adequate protection of public health and safety. This change is acceptable because the removed information (i.e., the actual setting limits for the RPS Instrumentation) will be located in the Kewaunee Setpoint Control Program. The Kewaunee setpoint methodology provides a means for processing changes to instrumentation setpoints, which is controlled by the Setpoint Control Program contained in ITS 5.5.16. The ITS 5.5.16 Setpoint Control Program identifies the NRC approved setpoint methodology and requires that the Allowable Values, Nominal Trip Setpoints, and As-Found and As-Left Tolerances be calculated using this NRC approved setpoint methodology. Changes to the Kewaunee setpoint methodology are made under 10 CFR 50.59, which ensures that changes are properly evaluated. This change is designated as a less restrictive removal of detail change because Allowable Value/Setpoint Information is being removed from the Technical Specifications and relocated to the Kewaunee Setpoint Control Program.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table TS 3.5-5 for Safeguards Bus Power Supply Functions has four columns stating various requirements for the Safeguards Bus Undervoltage Function and the Safeguards Bus Second Level Undervoltage Function. These columns are labeled "NO. OF CHANNELS" and "NO. OF CHANNELS TO TRIP." ITS 3.3.5 does not contain these columns. This changes the CTS by moving the information provided in these columns to the Bases. Note that Discussion of Change M01 addresses the changes to the number of channels required by the LCO.

The removal of these details, which relate 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

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

removal of detail change because information relating system design is being removed from the Technical Specifications.

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table TS 3.5-5 Footnote (1) to Functional Unit 1, Safeguards Bus Undervoltage, states that each channel consists of one instantaneous and one time-delayed relay in series. CTS Table TS 3.5-5 Footnote (3) to Functional Unit 2, Safeguards Bus Second Level Undervoltage, states that each channel consists of two time-delayed relays connected in series. ITS 3.3.5 does not contain this information. This changes the CTS by removing the details of the system design 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 to provide adequate protection of public health and safety. The ITS still retains the requirement for the LOOP DG Start 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.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-5 Column 3, operation shall be limited according to the requirement shown in Column 6 as soon as practicable. When the required number of channels per bus of CTS Table TS 3.5-5 Functional Unit 1 (Safeguards Bus Undervoltage) is not met, Column 3 requires one Safeguard Bus Undervoltage channel per bus be OPERABLE. Furthermore, the requirement in Column 3 is modified by Footnote (2), which states that when one component of a channel is taken out of service, that component shall be in the tripped condition. If the one required safeguard Bus Undervoltage channel for a bus is inoperable, then Table TS 3.5-5 Column 6 requires maintaining HOT SHUTDOWN or operating the diesel generator. When the one required Safeguards Bus Undervoltage is inoperable, ITS 3.3.5 ACTIONS A and B provide the appropriate compensatory measures. ITS 3.3.5 Required Action A.1 allows 1 hour to place the affected portion of the required channel in trip. However, as Noted, this Required Action is only allowed if the channel is inoperable due to one of the two relays being inoperable. If the channel is inoperable due to other reasons, then ITS 3.3.5 Required Action A.2 requires the required channel to be restored to OPERABLE status within 1 hour. If ITS 3.3.5 ACTION A is not met, ITS 3.3.5 ACTION B requires immediate entry into the applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOOP DG start instrumentation. This changes the CTS by providing a specific time to trip the channel (1 hour) and

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

provides alternate actions in lieu of shutting down the unit to HOT SHUTDOWN or starting the associated DG.

The purpose of the CTS Actions is to ensure proper compensatory measures are taken in the event of an inoperable Safeguard Bus Undervoltage channel. In the CTS, when a Safeguard Bus Undervoltage channel is inoperable due to a single relay being inoperable, the Footnote (2) allowance is followed and the relay is placed in the tripped condition. If the channel is inoperable such that tripping the relay is not appropriate, the unit is taken to HOT SHUTDOWN or the diesel generator is operated as required by the Column 6 requirement. No specific time is stated to perform the any of the above actions; however KPS currently follows the time specified in CTS 3.0.c to reach HOT SHUTDOWN. CTS 3.0.c requires action to be initiated within 1 hour and to reach HOT SHUTDOWN within the next 12 hours. Thus, the 1 hour time provided to trip the channel in the ITS or to restore the channel to OPERABLE status is consistent with the current 1 hour time to initiate actions. Thus, this part of the change is acceptable. If the channel is not placed in trip or restored to OPERABLE status within the 1 hour time limit, then the ITS requires immediate entry into the applicable Condition(s) and required Action(s) for the associated DG made inoperable by the LOOP DG start instrumentation is required. This change is acceptable since the instrumentation is a support system to the DG. The current requirements are overly restrictive since they would require a unit shutdown when only one DG is inoperable. If an DG were inoperable for other reasons, the CTS provides time to restore the single inoperable DG prior to requiring a unit shutdown. Furthermore, it is not desirable to start and run the DG and power the associated emergency bus only from the DG during unit operations for an extended time. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

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

CTS

O 1

3.3 INSTRUMENTATION

Offsite O

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

1

3.5.b, Table TS 3.5-1 Functional Units 9 and 10, Table TS 3.5-5, Functional Units 1 and 2

One | Safeguards Bus Undervoltage (|) | one

LCO 3.3.5 ~~[Three]~~ channel~~s~~ per bus of the loss of voltage Function and ~~[three]~~ channel~~s~~ per bus of the degraded voltage Function shall be OPERABLE.

Safeguards Bus Second Level Undervoltage (|)

3 2

DOC M02

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
A. One or more Functions with one required channel per bus inoperable. 1. Only applicable if inoperable channel is the result of one inoperable relay. INSERT 1	A.1	S -------------NOTES------------- 1. 2. The inoperable ~~channel~~ relay may be bypassed for up to ~~[4]~~ hours for surveillance testing of ~~other channels~~ the other relay of the channel. ----------------------------------- Place affected portion of the required channel in trip.	1 ~~[6]~~ hour~~s~~
~~B. One or more Functions with two or more channels per bus inoperable.~~	~~B.1~~	~~Restore all but one channel per bus to OPERABLE status.~~	~~1 hour~~
~~C~~ B. Required Action and associated Completion Time not met.	~~C~~ B.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

3.5.b, 3.5.c, Table TS 3.5-5 Functional Units 1 (including Note 2) and 2, Columns 3 and 6

3.5.c, Table TS 3.5-5 Functional Units 1 and 2, Columns 3 and 6

2 2 3 1

3 **INSERT 1**

OR

A.2	Restore required channel to OPERABLE status.	1 hour

CTS

LOP DG Start Instrumentation
3.3.5

O

1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
	SR 3.3.5.1 [Perform CHANNEL CHECK.	12 hours]	4
Table TS 4.1-1, Channel Descriptions 8.b and 8.c	SR 3.3.5.2 1 Perform TADOT in accordance with the Setpoint Control Program	[31] days	4 3 2
4.6.a.6; Table TS 4.1-1, Channel Descriptions 8.b and 8.c	SR 3.3.5.3 2 Perform CHANNEL CALIBRATION with [Nominal Trip Setpoint and Allowable Value] as follows: a. [Loss of voltage Allowable Value ≥ [2912] V and ≤ [ ] V with a time delay of [0.8] ± [ ] second. Loss of voltage Nominal Trip Setpoint [2975]V with a time delay of [0.8] ± [ ] second.] b. [Degraded voltage Allowable Value ≥ [3683] V and ≤ [ ] V with a time delay of [20] ± [ ] seconds. Degraded voltage Nominal Trip Setpoint [3746] V with a time delay of [20] ± [ ] seconds.]	[18] months	4 2
	in accordance with the Setpoint Control Program.		3 5

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START 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 ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. ISTS 3.3.5 ACTIONS A and B are written for a design that includes a two out of three logic design for each of the two Functions, and all three of the installed channels are required to be OPERABLE. The KPS design for the degraded voltage function includes one channel per bus, with each channel consisting of two degraded voltage relays in series. This is described in the ITS 3.3.5 Bases. Thus, when a channel is inoperable due to a single relay being inoperable, placing the affected portion of the channel in trip (i.e., the inoperable relay) is allowed by the CTS and is being maintained as ITS 3.3.5 Required Action A.1 and associated Note 1, similar to the allowance in ISTS 3.3.5 Required Action A.1. However, the time allowed to place the affected portion of the channel in trip is one hour, consistent with current requirements. If the channel is inoperable for other reasons, placing the entire channel in trip is not an option, since it could result in starting the DG and tieing it to the associated emergency bus. Therefore, under this condition, ITS 3.3.5 Required Action A.2 requires restoring the channel to OPERABLE status, similar to the ISTS 3.3.5 ACTION B when two of the three channels are inoperable. In addition, the 4 hour test allowance provided in ISTS 3.3.5 ACTION A.1 Note has been modified to apply only to the other relay of the channel, consistent with the KPS design. The 4 hour allowance of this Note is also consistent with the CTS allowances.

   For the loss of voltage Function, the KPS design includes two channels per bus, and either of the two channels can start the DG. Each of the channels consist of two loss of voltage relays in series, as described in the ITS Bases. However, the KPS CTS only requires one of the two channels per bus to be OPERABLE. This is being maintained in the ITS, because it is not necessary to require the loss of voltage instrumentation to be single failure proof for each of the DGs. The DGs themselves are single failure proof, in that only one DG is required to operate following a loss of offsite power event. Thus, based on the CTS allowance to only require one of the two channels per bus to be OPERABLE, the KPS channel design for the loss of voltage channels is similar to the degraded voltage channels, and the CTS allowance in Table TS 3.5-5 Note (2) to trip one of the two relays in a channel, the ITS 3.3.5 ACTIONS would apply to the loss of voltage Function similar to the degraded voltage Function actions described above. In addition, since the KPS design includes two Safeguards Bus Undervoltage (loss of voltage) channels per bus and the LCO only requires one Safeguards Bus Undervoltage (loss of voltage) channel per bus, ITS 3.3.5 Condition A and Required Actions A.1 and A.2 includes the word "required" and ITS SR 3.3.5.1 and SR 3.3.5.2 include the statement "of each required channel." This is consistent with the use of the word "required" in the ISTS (it is used when the design includes more components than the Technical Specification requires OPERABLE). Furthermore, since ISTS 3.3.5 ACTION B has been deleted, ISTS 3.3.5 ACTION C has been renumbered.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

4. ISTS SR 3.3.5.1 is deleted since the CHANNEL CHECK requirement is not applicable to the Kewaunee Power Station (KPS) instrumentation. A CHANNEL CHECK is defined as the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channel measuring the same parameter. Since KPS utilizes voltage relays in the LOOP DG Start instrumentation circuitry to indicate an undervoltage or degraded voltage condition, a comparison of channel indications is not a viable option for a comparison of channel indications or status. The subsequent Surveillance Requirements (SRs) have been renumbered, as applicable, to reflect this deletion.

5. Changes are made to the ISTS that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided when adopting TSTF-493. KPS has elected to implement TSTF-493 via the use of a Setpoint Control Program (SCP). Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled SCP. The requirements for the SCP are described in ITS Chapter 5, "Administrative Controls," of the Technical Specifications. Therefore, the Nominal Trip Setpoint and Allowable Value information has been deleted from ISTS SR 3.3.5.3.a and SR 3.3.5.3.b (ITS SR 3.3.5.2). In addition, this option requires that each instrument surveillance requirement which verifies a LSSS (both SL and non-SL LSSSs) contain a requirement to perform the surveillance test in accordance with the SCP. Thus, the phrase "in accordance with the Setpoint Control Program" has been added to ITS SR 3.3.5.2.

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

All changes are 1 unless otherwise noted

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

Offsite O

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. ~~Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs in the switchyard. There are two LOP start signals, one for each 4.16 kV vital bus.~~

INSERT 1

~~Three undervoltage relays with inverse time characteristics are provided on each 4160 Class 1E instrument bus for detecting a sustained degraded voltage condition or a loss of bus voltage. The relays are combined in a two-out-of-three logic to generate an LOP signal if the voltage is below 75% for a short time or below 90% for a long time.~~ The LOP start actuation is described in FSAR, Section 8.3 (Ref. 1).

INSERT 2

O DG U 2.

The Allowable Value in conjunction with the trip setpoint and LCO establishes the threshold for Engineered Safety Features Actuation System (ESFAS) action to prevent exceeding acceptable limits such that the consequences of Design Basis Accidents (DBAs) will be acceptable. The Allowable Value is considered a limiting value such that a channel is OPERABLE if the setpoint is found not to exceed the Allowable Value during the CHANNEL CALIBRATION. Note that although a channel is OPERABLE under these circumstances, the setpoint must be left adjusted to within the established calibration tolerance band of the setpoint 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.

O

<u>Allowable Values and LOP DG Start Instrumentation Setpoints</u>

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Alternatively, a TS format incorporating an Allowable Value only may be proposed by a licensee. In this case the Nominal Trip Setpoint value is located in the TS Bases or in a licensee controlled document outside the TS. Changes to the trip setpoint value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements. At their option, the licensee may include the trip setpoint in the surveillance requirement as shown, or suggested by the licensee's setpoint methodology.~~
~~--~~

2

1

INSERT 1

Each DG is capable of starting automatically on a Safeguard Bus Undervoltage (loss of voltage) or Safeguard Bus Second Level Undervoltage (degraded voltage) signal from its corresponding 4160 V Safeguard Bus (Emergency Bus 1-5 or 1-6). The signal will start the associated DG and trip the offsite power supply breakers to the associated emergency bus. Each DG has adequate capacity to supply one train of the engineered safety features (ESF) for the Design Basis Accident (DBA).

1

INSERT 2

The safeguards buses undervoltage (loss of power) trip limit and associated time delay is set to protect against loss of voltage or degraded voltage to the safeguards bus while eliminating most spurious trips. All safeguards equipment is designed to start and provide full function with supply voltages as low as 80% of nominal. The time delay feature avoids inadvertent trips, yet it assures that a safety injection sequence will proceed with the diesel generators at full capacity before the safety injection pumps start. Each relay in the undervoltage protection channels will fail safe and is alarmed to alert the operator to the failure.

There are two safeguard buses (bus 1-5 and bus 1-6). Each safeguard bus undervoltage Function has two channels per bus with only one channel per bus required to be OPERABLE. Four voltage relays provide input to the logic for each 4160 V bus for detecting a Safeguards Bus Undervoltage (loss of voltage) condition and two voltage relays provide input to the logic for each 4160 V bus for detecting a Safeguards Bus Second Level Undervoltage (degraded voltage) condition. The four loss of voltage relays are paired into two Safeguard Bus Undervoltage channels, with each channel consisting of an instantaneous loss of voltage relay in series with a time-delayed loss of voltage relay. Both relays must trip for the channel to trip and send a start signal to the associated DG and close supply breakers to the associated 4160 V emergency bus. The two time-delayed degraded voltage relays are paired (in series) in a single Safeguard Bus Second Level Undervoltage channel. Both relays must trip for the channel to trip and send a start signal to the associated DG and trip in supply breakers to the associated 4160 V emergency bus. The time delays are applied within the two Functions (loss of voltage and degraded voltage) to prevent actuations during normal transients. Furthermore, the time-delayed degraded voltage instrumentation protects the ESF equipment from long-term low voltage operation.

Therefore, with all four relays (two relays per channel per bus) OPERABLE the plant will be able to withstand a single active failure. Additionally, with one of the four relays inoperable the plant is no longer required to withstand a single active failure.

When all four relays are OPERABLE, if one of the four relays were to fail (single active failure) coincident with a loss of offsite power (LOOP), then the unaffected bus's relays would actuate causing the bus's emergency diesel generator to start loading the bus's ESF associated equipment mitigating the event. Alternately, if a single relay was inoperable or if one relay for each bus was inoperable then these relays would be

1 **INSERT 2 (continued)**

tripped and the single active failure requirement would no longer be required. The OPERABLE relays would sense the LOOP causing both buses emergency diesel generators to start loading both buses' associated ESF equipment. Thus, with only one channel per bus required to be OPERABLE the accident analyses are met and the single active failure criteria is met.

All changes are 1 unless otherwise noted

BASES

BACKGROUND (continued)

The Trip Setpoints used in the relays are based on the analytical limits presented in FSAR, Chapter 15 (Ref. 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.

Setpoints adjusted consistent with the requirements of the Allowable Value ensure that the consequences of accidents will be acceptable, providing the unit is operated from within the LCOs at the onset of the accident and that the equipment functions as designed.

Allowable Values and/or Nominal Trip Setpoints are specified for each Function in SR 3.3.5.~~3~~ 2. Nominal Trip Setpoints are also specified in the ~~unit specific setpoint calculations~~ Setpoint Control Program. The trip setpoints are selected to ensure that the setpoint measured by the surveillance procedure does not exceed the Allowable Value if the relay is performing as required. If the measured setpoint does not exceed the Allowable Value, the relay is considered OPERABLE. Operation with a trip setpoint less conservative than the nominal Trip Setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint ~~calculation~~ methodology (Ref. 3). 4

APPLICABLE SAFETY ANALYSES

The LOP O DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power. Its design basis is that of the ESF Actuation System (ESFAS).

Accident analyses credit the loading of the DG based on the loss of offsite power during a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG 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 analyses assume a non-mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP O DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in Reference 2, in which a loss of offsite power is assumed.

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 in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," include the appropriate DG loading and sequencing delay.

All changes are 1 unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES (continued)

The LOP DG start instrumentation channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

INSERT 3

The LCO for LOP DG start instrumentation requires that ~~[three] channels per bus of both the loss of voltage and degraded voltage Functions shall~~ be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. INSERT 4 In MODES 5 and 6, the ~~[three]~~ required 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. A relay for a channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the "as-left" calibration tolerance band of the Nominal Trip Setpoint. A trip setpoint may be set more conservative than the Nominal Trip Setpoint as necessary in response to plant conditions. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

3 4 4 3 4

APPLICABILITY

The LOP DG Start Instrumentation Functions are 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~~n~~ LOP or degraded power to the vital bus.

ACTIONS

~~-------------------------------------REVIEWER'S NOTE------------------------------~~
~~In TS 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation," the loss of power function was not included in the generic evaluations approved in either WCAP-10271, as supplemented, or WCAP-14333. In order to apply relaxations similar to those in WCAP-10271, as supplemented, or WCAP-14333, licensees must submit plant specific evaluations for NRC review and approval.~~
~~--~~

2

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected.

4 **INSERT 3**

one channel per bus for the Safeguards Bus Undervoltage (loss of voltage) Function and one channel per bus for the Safeguards Bus Second Level Undervoltage (degraded voltage) Function

4 **INSERT 4**

As stated in the Background section, each channel consists of two in-series relays (an instantaneous loss of voltage relay in series with a time-delayed loss of voltage relay for the Safeguards Bus Undervoltage Function and two in-series time-delayed degraded voltage relays for the Safeguards Bus Second Level Undervoltage Function).

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BASES

ACTIONS (continued)

Because the required channels are specified on a per bus basis, the Condition may be entered separately for each bus as appropriate.

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 the LCO. 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.

A.1 and A.2

Condition A applies to the LOP DG start Functions with one required loss of voltage or one degraded voltage channel per bus inoperable.

If one required channel is inoperable due to one of the two relays being inoperable, Required Action A.1 requires the affected portion of the required channel to be placed in trip within [6] 1 hour~~s~~. With ~~a~~ channel in trip, the LOP DG start instrumentation channel~~s~~ ~~are~~ is configured to provide a ~~one-out-of-three logic to initiate a~~ trip of the incoming offsite power supply breakers to the emergency bus and a start of the DG if the remaining relay detects a loss or degraded voltage condition, as applicable.

A Note is added to allow bypassing an inoperable relay of a channel for up to ~~[4]~~ hours for surveillance testing of ~~other channels~~ the other relay of the channel. This allowance is made where bypassing the channel does not cause an actuation and where at least two other channels are monitoring that parameter.

The specified Completion Time ~~and time allowed for bypassing one channel are~~ is reasonable considering the Function remains fully OPERABLE on every bus and the low probability of an event occurring during these intervals.

~~B.1~~

~~Condition B applies when more than one loss of voltage or more than one degraded voltage channel per bus are inoperable.~~

If the required channel is inoperable due to reasons other than one of the two relays being inoperable, Required Action ~~B.1~~ A.2 requires restoring ~~all but one~~ the required channel ~~per bus~~ to OPERABLE status. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP DG start occurring during this interval.

BASES

ACTIONS (continued)

C.1

Condition C applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Condition A or B are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources - Operating," or LCO 3.8.2, "AC Sources - Shutdown," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

Performance of the CHANNEL CHECK once every 12 hours 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 that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit 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.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.~~2~~ 1 — 4

SR 3.3.5.~~2~~ is the performance of a TADOT. 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 TADOT 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 is performed every ~~[~~31 days~~]~~. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. For these tests, the relay trip setpoints are verified and adjusted as necessary. INSERT 5 The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience. 3 5

SR 3.3.5.~~3~~ 2 — 4

SR 3.3.5.~~3~~ is the performance of a CHANNEL CALIBRATION.

The setpoints, as well as the response to a loss of voltage and a degraded voltage test, shall include a single point verification that the trip occurs within the required time delay, as shown in ~~Reference 1~~ the applicable time delay setpoint calculation. 1

A CHANNEL CALIBRATION is performed every ~~[~~18~~]~~ months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. INSERT 6 3 5

The Frequency of ~~[~~18~~]~~ months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an ~~[~~18~~]~~ month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. 3 3

REFERENCES

1. U ~~F~~SAR, Section ~~[8.3]~~ 8.2.3. 1 3

2. U ~~F~~SAR, Chapter ~~[15]~~ 14. 1 3

3. ~~Plant specific setpoint methodology study.~~ Technical Report EE-0116, Revision 6. 1

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5 **INSERT 5**

The Setpoint Control Program (SCP) has controls which require verification 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.

5 **INSERT 6**

The SCP has controls which require verification 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.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5 BASES, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START 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 or licensing basis description.

2. The Reviewer's Note has been deleted. The information is to alert the NRC reviewer to what is needed to meet this requirement. This information is not meant to be retained in the final version of the plant specific submittal.

3. The ISTS Bases contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design

4. Changes are made to reflect changes to the Specification.

5. Changes are made to the ISTS Bases that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions." Three options are provided for licensees to pursue when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications.

6. Typographical/grammatical error corrected.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.5, LOSS OF OFFSITE POWER (LOOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 6

ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

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

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. LA02

LCO 3.3.6, DOC A02

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5.

ACTION B, DOC A02

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable.

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip. M04

e. The accident monitoring instrumentation in Table TS 3.5-6 shall be OPERABLE whenever the plant is above HOT SHUTDOWN. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes. A change in operational MODES or conditions is acceptable with an inoperable accident monitoring instrumentation channel(s). See ITS 3.3.3

ITS

A01

ITS 3.3.6

3.8 REFUELING OPERATIONS

APPLICABILITY

Applies to operating limitations during REFUELING OPERATIONS.

OBJECTIVE

To ensure that no incident occurs during REFUELING OPERATIONS that would affect public health and safety.

SPECIFICATION

Applicability of Table 3.3.6-1 footnote (a)

a. During REFUELING OPERATIONS: L02

1. Containment Closure

   a. The equipment hatch shall be closed and at least one door in each personnel air lock shall be capable of being closed [1] in 30 minutes or less. In addition, at least one door in each personnel air lock shall be closed when the reactor vessel head or upper internals are lifted. See ITS 3.9.6

   b. Each line that penetrates containment and which provides a direct air path from containment atmosphere to the outside atmosphere shall have a closed isolation valve or an operable automatic isolation valve.

2. Radiation levels in fuel handling areas, the containment and the spent fuel storage pool shall be monitored continuously. See CTS 3.8.a.2

3. The reactor will be subcritical for 148 hours prior to movement of its irradiated fuel assemblies. See CTS 3.8.a.3 Core subcritical neutron flux shall be continuously monitored by at least two neutron monitors, each with continuous visual indication in the control room and one with audible indication in the containment whenever core geometry is being changed. When core geometry is not being changed at least one neutron flux monitor shall be in service. See ITS 3.9.2

4. At least one residual heat removal pump shall be OPERABLE. See ITS 3.9.3

5. When there is fuel in the reactor, a minimum boron concentration as specified in the COLR shall be maintained in the Reactor Coolant System during reactor vessel head removal or while loading and unloading fuel from the reactor. The required boron concentration shall be verified by chemical analysis daily. See ITS 3.9.1

---

[1] Administrative controls ensure that:
- Appropriate personnel are aware that both personnel air lock doors are open,
- A specified individual(s) is designated and available to close the air lock following a required evacuation of containment, and
- Any obstruction(s) (e.g., cables and hoses) that could prevent closure of an open air lock can be quickly removed.

See ITS 3.9.6

ITS

A01

ITS 3.3.6

6. Direct communication between the control room and the operating floor of the containment shall be available whenever changes in core geometry are taking place. See CTS 3.8.a.6

7. ~~Deleted.~~

8. The containment ventilation and purge system, including the capability to initiate automatic containment ventilation isolation, shall be tested and verified to be operable immediately prior to and daily during REFUELING OPERATIONS. See ITS 3.9.6

9. a. The spent fuel pool sweep system, including the charcoal adsorbers, shall be operating during fuel handling and when any load is carried over the pool if irradiated fuel in the pool has decayed less than 30 days. If the spent fuel pool sweep system, including the charcoal adsorber, is not operating when required, fuel movement shall not be started (any fuel assembly movement in progress may be completed). See CTS 3.8.a.9

   b. Performance Requirements

      1. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show $\geq$99% DOP removal and $\geq$99% halogenated hydrocarbon removal.

      2. The results of laboratory carbon sample analysis from spent fuel pool sweep system carbon shall show $\geq$95% radioactive methyl iodide removal when tested in accordance with ASTM D3803-89 at conditions of 30°C and 95% RH.

      3. Fans shall operate within $\pm$10% of design flow when tested.

   See ITS 5.5.9

10. The minimum water level above the vessel flange shall be maintained at 23 feet. See ITS 3.9.5

11. A dead-load test shall be successfully performed on both the fuel handling and manipulator cranes before fuel movement begins. The load assumed by the cranes for this test must be equal to or greater than the maximum load to be assumed by the cranes during the REFUELING OPERATIONS. A thorough visual inspection of the cranes shall be made after the dead-load test and prior to fuel handling. See CTS 3.8.a.11

12. A licensed senior reactor operator will be on-site and designated in charge of the REFUELING OPERATIONS. See CTS 3.8.a.12

ACTIONS A and C

b. If any of the specified limiting conditions for REFUELING OPERATIONS are not met, ~~refueling of the reactor shall cease. Work shall be initiated to correct the violated conditions so that the specified limits are met, and no operations which may increase the reactivity of the core shall be performed.~~

L02

L03

Add proposed ACTION A (for one channel inoperable) and ACTION C (for two or more channels inoperable during movement of irradiated fuel)

Amendment No. 200

TS 3.8-2 11/20/2008

A01

Table 3.3.6-1, Functions 2.a and 2.b

TABLE TS 3.5-1

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

LA02

NO.	FUNCTIONAL UNIT	CHANNEL	SETTING LIMIT
8	Containment Purge and Vent System Radiation Particulate Detector Radioactive Gas Detector	Containment ventilation isolation	≤ value of radiation levels in exhaust duct as defined in footnote (3)
9	Safeguards Bus Undervoltage (4)	Loss of power	85.0% ± 2% nominal bus voltage ≤ 2.5 seconds time delay
10	Safeguards Bus Second Level Undervoltage (5)	Degraded grid voltage	93.6% ± 0.9% of nominal bus voltage ≤ 7.4 seconds time delay

See ITS 3.3.5

See ITS 3.3.5

(3) The setting limits for max radiation levels are derived from ODCM Specification 3.4.1 and Table 2.2, and USAR Section 6.5.

LA02

(4) This undervoltage protection channel ensures ESF equipment will perform as assumed in the USAR.

(5) This undervoltage protection channel protects ESF equipment from long-term low voltage operation.

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A01

TABLE TS 3.5-4

INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS

See ITS 3.3.2

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT (LA03)	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS REQUIRED (A05)	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Containment Isolation						
	a. Safety Injection	Refer to Item No. 1 of Table TS 3.5-3					HOT SHUTDOWN(1)
	b. Manual	2	1 (LA03)	~~1~~ 2 (M01)	-		HOT SHUTDOWN (M05)
2	Steam Line Isolation						
	a. Hi-Hi Steam Flow with Safety Injection	2/loop	1	1(3)	-		HOT SHUTDOWN(1)
	b. Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection	2/loop	1	1(3)	-		HOT SHUTDOWN(1)
	c. Hi-Hi Containment Pressure	3	2	2(3)	-		HOT SHUTDOWN(1)
	d. Manual	1/loop	1/loop	1/loop(3)	-		HOT SHUTDOWN

Table 3.3.6-1 Function 3

See ITS 3.3.2

(1) If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in a COLD SHUTDOWN condition.
(3) Steam Line Isolation channels are not required to be operable when both main steam isolation valves are closed and deactivated.

Add proposed Function 1, including ACTIONS B and C

M02

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ITS

ITS 3.3.6

A01

Table 3.3.6-1 Function 5

Table 3.3.6-1 Function 2.a and 2.b

TABLE TS 3.5-4

INSTRUMENT OPERATING CONDITIONS FOR ISOLATION FUNCTIONS

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS REQUIRED A05	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
3	Containment Ventilation Isolation		LA03				
	a. High Containment Radiation	2	1 LA03	1	-	-	These channels are not required to activate containment ventilation isolation when the containment purge and ventilation system isolation valves are maintained closed.[(2)] ACTION B
	b. Safety Injection	Refer to Item 1 of Table TS 3.5-3					
	c. Containment Spray	Refer to Item 3 of Table TS 3.5-3					
4	Main Feedwater Isolation						
	a. Hi-Hi Steam Generator Level	3	2	2	1		HOT SHUTDOWN

Table 3.3.6-1 Function 4

See ITS 3.3.2

(2) The detectors are required for Reactor Coolant System leak detection as referenced in TS 3.1.d.5.

A06

Amendment No. 102
10/18/93

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4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SPECIFICATION

SR 3.3.6.1, SR 3.3.6.3, SR 3.3.6.4

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3.

See other ITS

c. Deleted

d. Deleted

e. Deleted

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ITS

ITS 3.3.6

A01

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

COT A04

CHANNEL DESCRIPTION	CHECK SR 3.3.6.1	CALIBRATE SR 3.3.6.4	TEST SR 3.3.6.3	REMARKS
18. a. Containment Pressure (SIS signal)	Each shift	Each refueling cycle	Monthly(a)	(a) Isolation Valve Signal
b. Containment Pressure (Steamline Isolation)	Each shift(a)	Each refueling cycle(a)	Monthly(a)	(a) Narrow range containment pressure (-3.0, +3.0 psig excluded)
c. Containment Pressure (Containment Spray Act)	Each shift	Each refueling cycle	Monthly	
d. Annulus Pressure (Vacuum Breaker)	Not applicable	Each refueling cycle	Each refueling cycle	
19. Radiation Monitoring System	~~Daily~~ ~~(a,b)~~ 12 hours A03	Each refueling cycle ~~(a)~~	Quarterly ~~(a)~~	~~(a) Includes only channels R11 thru R15, R19, R21, and R23~~ ~~(b) Channel check required in all plant modes~~
~~20. Deleted~~				
21. Containment Sump Level	Not applicable	Not applicable	Each refueling cycle	
22. Accumulator Level and Pressure	Each shift	Deleted	Not applicable	
23. Steam Generator Pressure	Each shift	Each refueling cycle	Monthly	

See ITS 3.3.2

See ITS 3.6.9

LA01

A03

M03

See ITS 3.4.15

See ITS 3.5.1

See ITS 3.3.2

Table 3.3.6-1, Functions 2.a and 2.b

Discussion of Change LA01 is for channel R11, R12, and 21. For other channels, see ITS 3.3.2, 3.3.7, 3.4.15, and CTS 3.8.a.9.

Add proposed SR 3.3.6.2 M02

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DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse 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 3.5.b, 3.5.c, and 3.5.d provide the compensatory actions to take when the Containment Purge and Vent isolation instrumentation is inoperable. ITS 3.3.6 ACTIONS provide the compensatory actions for Containment Purge and Vent Isolation Instrumentation. The ITS 3.3.6 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 Containment Purge and Vent Isolation Instrumentation Function.

This change is acceptable because it clearly states the current requirement. The CTS considers each Containment Purge and Vent Isolation Instrumentation Function to be separate and independent from each other. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS Table TS 4.1-1, Channel Description 19, Remarks Section Note (b) states that the Channel Check is required in all plant modes. ITS SR 3.3.6.1, the equivalent CHANNEL CHECK requirement, is only applicable in MODES 1, 2, 3, and 4, and during movement of irradiated fuel assemblies within containment. This changes the CTS by deleting this specific Note.

While the purpose of the Note appears to require the Channel Check requirement to be performed in all plant modes, CTS 4.0.a, which provides the general requirements of all Surveillance Requirements, specifically states that Surveillances are only required to be met during the operational MODES or other specified conditions in the LCO. While it does state that this can be modified as stated in an individual Surveillance, it further states that if the Surveillance is not met, then the actions of the LCO are to be taken. Thus, while this Note appears to require the Channel Check in all plant modes, in actuality, it only is required when the LCO has to be met. Therefore, the deletion of Note (b) is acceptable and considered administrative, since the technical requirements have not been changed.

A04 CTS Table TS 4.1-1, Channel Description 19 requires that the Radiation Monitoring System channels be demonstrated OPERABLE by performance of a channel TEST (i.e. a CHANNEL FUNCTIONAL TEST). ITS SR 3.3.6.3 requires the performance of a CHANNEL OPERATIONAL TEST (COT) for the Radiation Monitoring System channels. This changes the CTS by replacing the CHANNEL FUNCTIONAL TEST requirements with the COT requirements.

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This change is acceptable because the COT is a test similar to the current CHANNEL FUNCTIONAL TEST. The change is one of format only. In addition, the change to the CHANNEL FUNCTIONAL TEST definition is described in the Discussion of Changes in ITS 1.0. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 Column 3 of CTS Table TS 3.5-4 specifies the "MINIMUM OPERABLE CHANNELS" associated with each Functional Unit and CTS 3.5.c specifies the actions to take when the number of channels for a particular Functional Unit is less than the Column 3 requirements. ITS LCO 3.3.6 requires the Containment Purge and Vent Isolation Instrumentation to be OPERABLE, and includes only one column in Table 3.3.6-1 titled "REQUIRED CHANNELS." This changes the CTS by changing the title of the MINIMUM OPERABLE CHANNELS" column to "REQUIRED CHANNELS."

This change is acceptable because the ITS Table 3.3.6-1 "REQUIRED CHANNELS" column reflects required actions to be taken, consistent with the CTS column when actions must be taken. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 Column 6 of CTS Table TS 3.5-4 contains a footnote (2) that states the detectors that provide a high radiation signal for the initiation of a Containment Purge and Vent Isolation are required for Reactor Coolant System leak detection as referenced in CTS 3.1.d.5. ITS 3.3.6 does not contain this footnote, or a reference to CTS 3.1.d.5. This changes the CTS by deleting the reference footnote.

The purpose of the footnote reference is to alert the user that additional isolation requirements exist that may affect satisfying the requirements of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is considered administrative because the technical requirements have not changed.

<u>MORE RESTRICTIVE CHANGES</u>

M01 CTS 3.5.c states, in part, that when the number of channels of a subsystem fall below the limits given in Table TS 3.5-4 Column 3, operation shall be limited according to the requirement shown in Column 6 as soon as practicable. Table TS 3.5-4 Functional Unit 1.b (Containment Isolation - Manual), Column 3 requires one Manual channel to be OPERABLE. Thus, while there are two Manual channels in the KPS design, the CTS allows one of the Manual channels to be inoperable for an indefinite amount of time; no actions are required when one of the two Manual channels is inoperable. ITS Table 3.3.6-1 Functional Unit 3 references ITS LCO 3.3.2 for the number of required channels. ITS Table 3.3.2-1 Function 3.a requires two channels of the Containment Isolation – Manual Initiation Function to be OPERABLE and provides the appropriate ACTION and Surveillance Requirements. ITS 3.3.2 ACTION B provides compensatory actions to take with one Manual channel inoperable. ACTION B requires restoring the channel to OPERABLE status within 48 hours or to be in MODE 3 within 54 hours and MODE 5 within 84 hours. This changes the CTS by

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requiring two channels of the Manual Initiation Functional Unit to be OPERABLE instead of one channel and by adding a specific ACTION to take when one of the two required channels is inoperable.

The purpose of the new ITS channel requirement and proposed ACTION is to ensure that appropriate compensatory actions are taken if any of the installed Containment Isolation Manual Initiation channels are inoperable. This change is acceptable because the new channel requirement in ITS LCO 3.3.6 will ensure that all of the installed channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure under all conditions. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable for an indefinite period of time. This change is also acceptable because the new Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M02 CTS Table TS 3.5-4 Functional Unit 3 provides requirements for Containment Ventilation Isolation Functions, but does not explicitly provide requirements for the Automatic Actuation Logic and Actuation Relays Function that result in closure of the containment purge supply and vent isolation valves. ITS 3.3.6, "Containment Purge and Vent Isolation Instrumentation," requires the Automatic Actuation Logic and Actuation Relays (Function 1) to be OPERABLE, provides appropriate ACTIONS if the Function is inoperable (ITS 3.3.6 ACTIONS B and C), and provides a Surveillance Requirement (ITS SR 3.3.6.2) to ensure the proper functioning of the associated actuation logic relays. This changes the CTS by explicitly requiring the Automatic Actuation Logic and Actuation Relays Function for the Containment Purge and Vent System isolation instrumentation to be OPERABLE and providing appropriate ACTIONS and Surveillance Requirements.

This change is acceptable because the Automatic Actuation Logic and Actuation Relays Function is required to support the OPERABILITY of the containment purge and vent isolation valves. As such, explicitly including requirements for the Automatic Actuation Logic and Actuation Relays Functions in the Technical Specifications provides additional assurance that the OPERABILITY of the Containment Purge and Vent System isolation instrumentation will be maintained. The change provides explicit requirements for the Automatic Actuation Logic and Actuation Relays Function (Table 3.3.6-1, Function 1) to be OPERABLE, and provides appropriate actions if it is inoperable. The addition of SR 3.3.6.2 (ACTUATION LOGIC TEST) is acceptable since the actuation logic testing Frequency is consistent with similar tests in ITS 3.3.1 and 3.3.2. The requirements for the Containment Purge and Vent System isolation instrumentation continue to require the isolation of the Containment Purge and Vent System upon Containment High Radiation, Safety Injection and Containment Spray signals. This change is designated as more restrictive because it adds explicit OPERABILITY requirements, ACTIONS, and SRs for the Automatic Actuation Logic and Actuation Relays Function to the CTS.

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M03 CTS Table TS 4.1-1 Channel Description 19 requires a Daily instrument check of the radiation monitoring system. ITS SR 3.3.6.1 requires the performance of a CHANNEL CHECK of the required containment purge and vent isolation radiation monitors every 12 hours. This changes the CTS by requiring a check of the required containment purge and vent isolation radiation monitors more often in ITS than in CTS.

The purpose of the instrument check is to demonstrate that the required containment purge and vent isolation radiation monitors are OPERABLE and capable of providing an early indication of any abnormal leakage conditions in the containment. ITS SR 3.3.6.1 provides reasonable confidence that the channel is operating properly. This change is designated more restrictive because less time is allowed between performances of the CHANNEL CHECK than was allowed in the CTS.

M04 CTS 3.5.d states, in part, that in the event of subsystem instrumentation channel failure permitted by CTS 3.5.b, then Tables TS 3.5-2 through TS 3.5-5 need not be observed for approximately 4 hours while the operable channels are tested, as long as the failed channel is blocked to prevent an unnecessary reactor trip. CTS 3.5.b states, in part, that in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5. ITS 3.3.6 does not contain this allowance. This changes the CTS by removing the allowance to block a failed channel.

The purpose of CTS 3.5.d is to allow time to perform testing of the operable subsystem channels without entering into the requirements specified in Tables TS 3.5-2 through TS 3.5-5. In order to perform this task, the inoperable channel must be placed in bypass. Currently, KPS does not have the ability to perform a bypass of an inoperable channel for the purpose of testing without performing a temporary alteration of the circuit. Since the installation of temporary alterations is intrusive, KPS has determined that this practice is unacceptable. Therefore KPS does not have the ability to perform testing with a channel in bypass and the allowance is not incorporated in the ITS. This change is designated as more restrictive because an allowance that was allowed in the CTS is not allowed in the ITS.

M05 CTS Table TS 3.5-4 Functional Unit 1.b requires that when both Containment Isolation Manual channels are inoperable, to place the unit in HOT SHUTDOWN (ITS MODE 3). Since there is no time limit to attain HOT SHUTDOWN, KPS uses the time limit from CTS 3.0.c. CTS LCO 3.0.c requires that within 1 hour action shall be initiated to place the unit in at least HOT STANDBY (equivalent to ITS MODE 2) within the next 6 hours and in HOT SHUTDOWN (equivalent to ITS MODE 3) within the following 6 hours. ITS 3.3.6 references ITS 3.3.2 for the appropriate requirements for the Containment Isolation - Manual Initiation Function. ITS 3.3.2, which requires two Containment Isolation - Manual Initiation channels to be OPERABLE in MODES 1, 2, 3, and 4, does not provide any ACTIONS to take when both Containment Isolation - Manual Initiation channels are inoperable. Therefore, ITS LCO 3.0.3 would be entered, which requires actions to be taken within 1 hour to be in MODE 3 within 7 hours, to be in MODE 4 within 13 hours, and to be in MODE 5 within 37 hours. This changes the CTS

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

by allowing less time to reach HOT SHUTDOWN (ITS MODE 3) in the ITS than in the CTS (7 hours in the ITS versus 13 hours in the CTS) and by requiring the unit to go to MODE 5 in lieu of MODE 3.

The purpose of requiring the unit to be shutdown is to place the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation. This change is acceptable since it provides the appropriate actions to take under certain conditions. These conditions are for when both channels of the Function are inoperable. This Specification also delineates the time limits for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. Upon entering LCO 3.0.3, 1 hour is allowed to prepare for an orderly shutdown before initiating a change in unit operation. The time limits specified to reach lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner. The time limits of LCO 3.0.3 allow 7 hours to be in MODE 3 (compared to 13 hours in the CTS), 13 hours to be in MODE 4 (no action in the CTS), and 37 hours for the unit to be in MODE 5 (no action in the CTS). Additionally, the CTS requirement to be in MODE 2 is not maintained since the ITS requires the unit to be in MODE 3 (a lower MODE) within the same time limit (i.e., 7 hours). This change is designated as more restrictive because less time is allowed to reach MODE 3 than was allowed in the CTS and a new time to reach MODE 4 (13 hours) and MODE 5 (37 hours) has been added.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table TS 4.1-1 Channel Description 19, Remarks Section Note (a) states that the CHECK, CALIBRATE, and TEST Frequencies for the Radiation Monitoring System are applicable only to channels R11 thru R15, R19, R21, and R23. For the Containment Purge and Vent Isolation Instrumentation Specification, only instruments R11, R12, and R21 apply. ITS 3.3.6 does not contain this note. This changes the CTS by removing the description of the applicable channels to the Bases.

The removal of these details (instruments R11, R12, and R21), which are related to system design from the Technical Specifications, is acceptable because this type of information is not necessary to be included to provide adequate protection of public health and safety. The ITS still retains the requirement to perform the CHANNEL CHECK, CHANNEL CALIBRATION , and the CHANNEL OPERABILITY TEST (COT) for the Radiation Monitoring System. 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

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

controlled. The removal of the other Instruments, R13, R14, R15, R19, and R23, will be discussed in other Discussion of Changes (i.e., in other Specifications). 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 3.5.a states setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1. CTS Table TS 3.5-1 No. 8 states a setting limit of "≤ value of radiation levels in exhaust duct as defined in Footnote (3)" for the Containment Purge and Vent System Radiation Particulate Detector and Radioactive Gas Detector Functional Unit channel. Footnote 3 states the setting limits for maximum radiation levels are derived from ODCM Specification 3.4.1 and Table 2.2, and USAR Section 6.5. ITS 3.3.6 does not contain this setting limit information. This changes the CTS by removing the setting limit information of the Containment Purge and Vent System Radiation Particulate Detector and Radioactive Gas Detector functional unit and placing it in the KPS Setpoint Control Program document.

The removal of these Setting Limit values from the Technical Specifications and the subsequent addition of the methodology that controls changes to the Setting Limit values to ITS 5.5.16 will provide adequate protection of public health and safety. This change is acceptable because the removed information (i.e., the actual setting limits for the RPS Instrumentation) will be located in the Kewaunee Setpoint Control Program. The Kewaunee setpoint methodology provides a means for processing changes to instrumentation setpoints, which is controlled by the Setpoint Control Program contained in ITS 5.5.16. The ITS 5.5.16 Setpoint Control Program identifies the NRC approved setpoint methodology and requires that the Allowable Values, Nominal Trip Setpoints, and As-Found and As-Left Tolerances be calculated using this NRC approved setpoint methodology. Changes to the Kewaunee setpoint methodology are made under 10 CFR 50.59, which ensures that changes are properly evaluated. This change is designated as a less restrictive removal of detail change because Allowable Value/Setpoint Information is being removed from the Technical Specifications and relocated to the Kewaunee Setpoint Control Program.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table TS 3.5-4 Functional Unit 3 for Containment Ventilation Isolation has five columns stating various requirements for the Containment Ventilation Isolation Functions. These columns are labeled "NO. OF CHANNELS" and "NO. OF CHANNELS TO TRIP." ITS 3.3.6 does not retain these columns. This changes the CTS by removing the information of these 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 to provide adequate protection of public health and safety. The ITS still retains the requirement for the Containment Purge and Vent Isolation Instrumentation be OPERABLE and specifies the number of required channels. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

by the Technical Specification Bases Control Program in ITS 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 system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 Not used.

L02 *(Category 2 – Relaxation of Applicability)* CTS 3.8.a.1.b requires an OPERABLE automatic isolation valve under certain conditions. This is referring to the Containment Purge and Vent System valves, and thus includes the instruments that provide the isolation signal. The Specification is applicable during REFUELING OPERATIONS. This requirement can be met by an OPERABLE automatic isolation valve or a closed isolation valve. When this requirement is not being met, CTS 3.8.b provides actions to be taken if any of the specified limiting conditions in CTS 3.8.a are not met during REFUELING OPERATIONS. ITS 3.3.6 is applicable, in part, during movement of irradiated fuel assemblies within containment, as stated in footnote (a) to Table 3.3.6-1. This changes the CTS by requiring the containment purge and vent isolation instrumentation be OPERABLE during times of movement of irradiated fuel assemblies within containment, in lieu of during REFUELING OPERATIONS.

The purpose of CTS 3.8.a.1.b is to ensure each line that penetrates containment and provides a direct air path from containment atmosphere to the outside atmosphere have a closed isolation valve or an OPERABLE automatic isolation valve. Continuous monitoring of the radiation levels of the containment atmosphere (general or exhaust vent) is required to provide automatic action during an unsafe condition as a result of a fuel handling accident. CTS 3.8.a.1.b requires an OPERABLE automatic isolation valve during REFUELING OPERATIONS, and includes the isolation instrumentation. As defined in CTS Section 1.0, REFUELING OPERATIONS is movement of reactor vessel internal components that could affect the reactivity of the core within the containment when the vessel head is unbolted or removed. This would include both moving irradiated fuel assemblies and control rods. Since movement of irradiated fuel assemblies within containment can only occur when the vessel head is unbolted ore removed, ITS 3.3.6 is applicable, with respect to moving fuel assemblies, under the same conditions as CTS 3.8.a.1.b. This change is acceptable because the requirements continue to ensure that the process variables are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. The fuel handling accident is based on damaging a single irradiated fuel assembly. Movement of control rods is not assumed to result in a fuel handling accident. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L03 *(Category 4 – Relaxation of Required Action)* CTS 3.8.a.1.b requires an OPERABLE automatic isolation valve under certain conditions. This is referring to the Containment Purge and Vent System valves, and thus includes the instruments that provide the isolation signal. The Specification is applicable

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

during REFUELING OPERATIONS. When this requirement is not being met, the isolation valve must be closed or CTS 3.8.b requires refueling of the reactor to cease, initiation of action to restore the monitoring capability, and no operations be performed that could increase the reactivity of the core. Under similar conditions, ITS 3.3.6 does not require the refueling of the reactor to cease or require all operations that could increase the reactivity of the core to cease. With one radiation monitoring channel inoperable, ITS 3.3.6 ACTION A requires restoration of the affected channel to OPERABLE status within 4 hours. ITS 3.3.6 ACTION C, which is only applicable during the movement of irradiated fuel assemblies within containment, requires immediately placing and maintaining containment purge and vent valves in the closed position (Required Action C.1) or immediately entering the applicable Conditions and Required Actions of LCO 3.9.6 for containment purge and vent valves made inoperable by isolation instrumentation (Required Action C.2). Note that under this condition ITS LCO 3.9.6 would require suspension of movement of irradiated fuel assemblies in containment. This changes the CTS by deleting the requirements to cease refueling of the reactor and that no operations be performed that could increase the reactivity of the core and provides new ACTIONS to restore the radiation monitors to service and maintain the containment boundary.

The purpose of CTS 3.8.a.1.b is to ensure the Containment Purge and Vent System is OPERABLE to provide automatic actuation of the valves if an unsafe condition as a result of a fuel handling accident occurs or the valves are closed. CTS 3.8.b requires compensatory actions be taken to exit the Applicability of the LCO if continuous monitoring is not available and the isolation valves cannot be closed; however, the CTS Actions are overly restrictive. The proposed compensatory actions of ITS 3.3.6 ACTIONS A and C endure that acceptable actions are taken when radiation channels are inoperable. The proposed ACTION A is acceptable since channels are still available to ensure the containment purge and vent valve receive an isolation signal. The proposed ACTION C is acceptable since when multiple channels are inoperable, the proposed action places the containment purge and vent valves in the isolated position, which performs the function of the radiation channels. This change is designated as less restrictive since less restrictive actions have been added for when the radiation channels are inoperable.

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

3.3 INSTRUMENTATION

3.3.6 Containment Purge and ~~Exhaust~~ Vent Isolation Instrumentation 1

3.5.b LCO 3.3.6 The Containment Purge and ~~Exhaust~~ Vent Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE. 1

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

--NOTE--

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.8.b	A. One radiation monitoring channel inoperable.	A.1 Restore the affected channel to OPERABLE status.	4 hours
3.5.c, Table TS 3.5-4 Functional Units 1.b and 3.a Column 6, DOC M02	B. ------------NOTE------------ Only applicable in MODE 1, 2, 3, or 4. --------------------------------- One or more Functions with one or more ~~manual or~~ automatic actuation trains inoperable. OR Two or more radiation monitoring channels inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge and ~~exhaust~~ vent isolation valves made inoperable by isolation instrumentation.	Immediately 1 6

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.8.b, DOC M02, Table TS 3.5-4 Functional Unit 3.a Column 6 — C. ------------NOTE------------ Only applicable during movement of ~~[recently]~~ irradiated fuel assemblies within containment. --------------------------------- One or more Functions with one or more ~~manual~~ ~~or~~ automatic actuation trains inoperable. OR Two or more radiation monitoring channels inoperable. OR Required Action and associated Completion Time for Condition A not met.	C.1 Place and maintain containment purge and ~~exhaust~~ vent valves in closed position. (2) (1) OR C.2 Enter applicable Conditions and Required Actions of LCO 3.9.~~4~~ 6, "Containment Penetrations," for containment purge and ~~exhaust~~ vent isolation valves made inoperable by isolation instrumentation. (6) (3) (1)	Immediately Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Purge and ~~Exhaust~~ Vent Isolation Function. (1)

SURVEILLANCE		FREQUENCY
4.1.a, Table TS 4.1-1 Channel Description 19 — SR 3.3.6.1	Perform CHANNEL CHECK.	12 hours

CTS

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
SR 3.3.6.2	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS	4
SR 3.3.6.3	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS	8
-------------------------------REVIEWER'S NOTE------------------------------- The Frequency of 92 days on a STAGGERED TEST BASIS is applicable to the actuation logic processed through the Relay or Solid State Protection System. --			7
DOC M02 [SR 3.3.6.4 2	------------------------------NOTE------------------------------ This Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. -- Perform ACTUATION LOGIC TEST.	92 days on a STAGGERED TEST BASIS]	2 4 2
-------------------------------REVIEWER'S NOTE------------------------------- The Frequency of 92 days on a STAGGERED TEST BASIS is applicable to the master relay as processed through the Solid State Protection System. --			
[SR 3.3.6.5	------------------------------NOTE------------------------------ This Surveillance is only applicable to the master relays of the ESFAS Instrumentation. -- Perform MASTER RELAY TEST.	92 days on a STAGGERED TEST BASIS]	8
4.1.a, Table TS 4.1-1 Channel Description 19 SR 3.3.6.6 3	Perform COT. in accordance with the Setpoint Control Program.	92 days	4 5

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
SR 3.3.6.7	Perform SLAVE RELAY TEST.	[92] days	8
SR 3.3.6.8	-------------------------------NOTE------------------------------ Verification of setpoint is not required. -- Perform TADOT.	[18] months	6
4.1.a, Table TS 4.1-1 Channel Description 19 — SR 3.3.6.9 4	Perform CHANNEL CALIBRATION. in accordance with the Setpoint Control Program.	[18] months	4 2

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CTS

Containment Purge and Exhaust Isolation Instrumentation
Vent
3.3.6

1

Table 3.3.6-1 (page 1 of 1)
Containment Purge and Exhaust Isolation Instrumentation
Vent

1

5

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
	1. Manual Initiation	1,2,3,4, (a)	2	SR 3.3.6.6	NA	6
DOC M02	1 2. Automatic Actuation Logic and Actuation Relays	1,2,3,4, (a)	2 trains	SR 3.3.6.2 SR 3.3.6.3 SR 3.3.6.5	NA	6
Table TS 3.5-1 Functional Unit 8, Table TS 3.5-4 Functional Unit 3a, Table TS 4.1-1 Channel Description 19	2 3. [Containment Radiation					6 2
	a. Gaseous	1,2,3,4, (a)	2 [1]	SR 3.3.6.1 SR 3.3.6.4 3 SR 3.3.6.7 4	≤ [2 x background]	2
	b. Particulate	1,2,3,4, (a)	[1]	SR 3.3.6.1 SR 3.3.6.4 3 SR 3.3.6.7 4	≤ [2 x background]	2
	c. Iodine	1,2,3,4, (a)	[1]	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	≤ [2 x background]	1
	d. Area Radiation	1,2,3,4, (a)	[1]	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	≤ [2 x background]]	1
Table TS 3.5-4 Functional Unit 1.b	3 4. Containment Isolation - Phase A Manual Initiation	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.				6

INSERT 1 1

3.8.a (a) During movement of [recently] irradiated fuel assemblies within containment. 2

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1

INSERT 1

4. Containment Spray – Manual Initiation	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 2.a, for all initiation functions and requirements.
5. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION 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 ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. ISTS 3.9.4 has been renumbered to ITS 3.9.6.

4. The ISTS contains a Surveillance Requirement (SR) for an ACTUATION LOGIC TEST (ISTSSR 3.3.6.2) for the Containment Purge and Vent Isolation Instrumentation that is performed every 31 days on a STAGGERED TEST BASIS. The ISTS also contains an ACTUATION LOGIC TEST (ISTS SR 3.3.6.4) for the Containment Purge and Vent Isolation Instrumentation that is performed every 92 days on a STAGGERED TEST BASIS. ISTS SR 3.3.6.4 was added to the ISTS as part of the incorporation of TSTF-411, which, in part, increases the surveillance test interval (STI) for the actuation logic and actuation relays. The basis for the increase in the STI is WCAP-15376-P, Revision 0, which is consistent with the Nuclear Regulatory Commission's (NRC) approach for using probabilistic risk assessment in risk-informed decisions on plant-specific changes to the current licensing basis as presented in Regulatory Guides 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," and 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." KPS has elected to adopt the specific ISTS changes authorized by the results of WCAP-15376-P Revision 0. Therefore, the bracketed ISTS SR 3.3.6.4 (ITS SR 3.3.6.2) has been adopted for testing of the actuation logic and actuation relays. Subsequent Surveillance Requirements have been renumbered as a result of not including ISTS SR 3.3.6.2 in the ITS.

5. Changes are made to the ISTS that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided when adopting TSTF-493. KPS has elected to implement TSTF-493 via the use of a Setpoint Control Program (SCP). Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled SCP. The requirements for the SCP are described in ITS Chapter 5, "Administrative Controls," of the Technical Specifications. Therefore, the TRIP SETPOINT column has been deleted from Table 3.3.6-1 of the ITS. In addition, this option requires that each instrument surveillance requirement which verifies a LSSS (both SL and non-SL LSSSs) contain a requirement to perform the surveillance test in accordance with the SCP. Thus, the phrase "in accordance with the Setpoint Control Program" has been added to ITS SR 3.3.6.3, CHANNEL OPERATIONAL TEST (COT) and ITS SR 3.3.6.4, CHANNEL CALIBRATION.

6. The design of the KPS Containment Purge and Vent System is such that the manual initiation of the containment purge and vent isolation valves is either through the containment isolation logic or the containment spray actuation logic of

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

the Engineered Safety Features Actuation System (ESFAS). Therefore, ISTS 3.3.6 Function 1, Manual Initiation, has been deleted from Table 3.3.6-1. Furthermore, the words "manual or" have been deleted from Conditions B and C due to this deletion. In addition, the Trip Actuating Device Operational Test (TADOT) Surveillance Requirement (ISTS SR 3.3.6.8) has been deleted from ITS 3.3.6 and the manual initiation of the containment purge and vent isolation valves will be satisfied in the Surveillance Requirements of ITS 3.3.2, "Engineered Safety Features Actuation System (ESFAS)." All subsequent Surveillance Requirements have been renumbered as applicable.

7. The Reviewer's Note has been deleted. The information is to alert the NRC reviewer to what is needed to meet this requirement. This information is not meant to be retained in the final version of the plant specific submittal.

8. The ISTS contains a Surveillance Requirement (SR) for a MASTER RELAY TEST every 31 days on a STAGGERED TEST BASIS (ISTS SR 3.3.6.3) and a MASTER RELAY TEST every 92 days on a STAGGERED TEST BASIS (ISTS SR 3.3.6.5). ISTS SR 3.3.6.5 was added to the ISTS as part of the incorporation of TSTF-411, which, in part, increases the surveillance test interval for the master relays. The ISTS also contains a SR for a SLAVE RELAY TEST every 92 days (ISTS SR 3.3.6.7). These Surveillance Requirements are not included in the KPS ITS.

   This is acceptable because in response to Generic Letter 96-01 "Testing of Safety-Related Logic Circuits" KPS verified that the appropriate relays, contacts, and wiring runs were being tested for "overlap". The results of this effort were changes and enhancements to KPS procedures to ensure every aspect of the Safety Related Logic Circuits were being tested. The Master and Slave relays that can be checked online without affecting safety and reliability are checked during the Actuation Logic Test (ALT). The remaining portions of the circuits that cannot be checked during the Actuation Logic Test are checked by various other procedures when plant conditions allow for the safe and reliable testing of these portions. All of this was documented in the KPS response to Generic Letter 96-01.

   KPS design does not allow for monthly or quarterly testing of the Master Relays and Slave Relays in a separate test. Kewaunee design does not include special test circuitry that would allow convenient testing of all relays. To successfully test all of the master and slave relays, very intrusive test setups would be required that in and of themselves would jeopardize the safety of the maintenance personnel (installing temporary jumpers in energized cabinets) and could jeopardize the safety and reliability of the nuclear plant (inadvertent initiation of containment spray or safety injection, etc.).

   ESFAS relay logic test circuit design for Westinghouse 2-loop plants of KPS vintage generally consists of input relays, latching relays (master), non-latching relays (slave) and test relays. When ESF is placed in test for Actuation Logic Testing (ALT), the test relay contacts block energizing of any master or slave relays whose contacts are connected to external equipment actuation circuits for the entire train. This precludes inadvertent initiation of SI or Containment Spray etc. All master and slave relays whose contacts remain within the logic are allowed to energize as each input relay matrix is made up. The relays that are allowed to energize or those blocked is unique to each logic function, based on

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

circuit design. There is a continuity check feature for each master or slave relay coil circuit that is blocked when in test.

In a letter from Wisconsin Public Service to the NRC dated April 19, 1996 in response to Generic Letter 96-01 and subsequently accepted in a letter from the NRC dated January 14, 1999, WPSC states and the NRC accepts that:

> "The Kewaunee Nuclear Power Plant began construction in the late 1960's and received its operating license in 1973. As such the design does not include the same capabilities for testing as the more recently licensed plants. The limitations in the testing capability were recognized and acknowledged during original plant licensing and during development of the plant technical specifications. The original plant NRC safety evaluation report (Reference 4) reviewed and accepted the design and periodic testing practices for the ESF logic circuits." An excerpt from that evaluation report is repeated below:
>
> "…test capability of the ESF logic circuitry beyond the master relays with the plant at power is limited. Testing of the logic master relay must be accomplished by blocking the slave relays which normally actuate the engineered safety features. Periodic testing of the slave relays and actuated relays will be limited to checking relay coil resistance and actuated device circuitry for continuity. This design does not meet the recently approved safety guide criterion on the subject. However, we consider that backfitting the system would not provide substantial additional protection to the public health and safety and, hence, is not warranted. The applicant's capability to test, as described, is consistent with designs recently approved for operating licenses. We have concluded that the testing capability for the Kewaunee plant is acceptable."

WPSC has concluded that this testing meets the technical specification requirements, and, in response to question 23 of enclosure 3 to the acceptance letter from the NRC to WPSC in response to letters concerning Generic Letter 96-01, dated January 14, 1999, the NRC concluded that previously accepted testing practices would continue to remain acceptable."

Therefore, all master and slave relays in ESF that can be safely checked online and do not pose a significant risk to plant reliability are checked during the performance of the Actuation Logic Test (ALT). The remainder of the Master and Slave Relays are checked by actual equipment operation when the plant conditions are such that it does not significantly affect safety and reliability in the plant. KPS currently tests and meets the requirements of Generic Letter 96-01 and the inclusion of specific Master or Slave Relay Testing would be intrusive and/or affect safety and reliability due to the design of KPS. This was acknowledged in the original plant NRC SER, a letter from WPSC to the NRC dated April 19, 1996 in regard to Generic Letter 96-01, and the acceptance letter from the NRC to WPSC dated January 14, 1999 in regard to Generic Letter 96-01. KPS testing of the Master and Slave Relays is limited and plant design does not allow for safely and reliably performing separate Master and Slave Relay Testing surveillances.

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

Vent

All changes are 1 unless otherwise noted

B 3.3 INSTRUMENTATION

Vent

B 3.3.6 Containment Purge and Exhaust Isolation Instrumentation

Containment Vessel Air Handling System, consisting of the Containment Air Cooling and Containment Purge and Vent Systems

BASES

vent

BACKGROUND

Containment purge and exhaust isolation instrumentation closes the containment isolation valves in the Mini Purge System and the Shutdown Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The Mini Purge System may be in use during reactor operation and the Shutdown Purge System will be in use with the reactor shutdown.

Containment Air Cooling

Containment Purge and Vent

vent n 2

Containment purge and exhaust isolation initiates on a automatic safety injection (SI) signal through the Containment Isolation - Phase A Function, or by manual actuation of Phase A Isolation. The Bases for LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," discuss these modes of initiation.

INSERT 1

Three vent three

Four radiation monitoring channels are also provided as input to the containment purge and exhaust isolation. The four channels measure containment radiation at two locations. One channel is a containment area gamma monitor, and the other three measure radiation in a sample of the containment purge exhaust. The three purge exhaust radiation detectors are of three different types: gaseous, particulate, and iodine monitors. All four detectors will respond to most events that release radiation to containment. However, analyses have not been conducted to demonstrate that all credible events will be detected by more than one monitor. Therefore, for the purposes of this LCO the four channels are not considered redundant. Instead, they are treated as four one-out-of-one Functions. Since the purge exhaust monitors constitute a sampling system, various components such as sample line valves, sample line heaters, sample pumps, and filter motors are required to support monitor OPERABILITY.

INSERT 2

three

radiation

three valves

Each of the purge systems has inner and outer containment isolation valves in its supply and exhaust ducts. A high radiation signal from any one of the four channels initiates containment purge isolation, which closes both inner and outer containment isolation valves in the Mini Purge System and the Shutdown Purge System. These systems are described in the Bases for LCO 3.6.3, "Containment Isolation Valves."

Containment Purge and Vent

and the 2 inch containment vent isolation valves

APPLICABLE SAFETY ANALYSES

The safety analyses assume that the containment remains intact with penetrations unnecessary for core cooling isolated early in the event, within approximately 60 seconds. The isolation of the purge valves has not been analyzed mechanistically in the dose calculations, although its

1 **INSERT 1**

; a manual SI signal; a manual containment vent isolation signal; or a manual containment spray signal (of both trains)

1 **INSERT 2**

is a particulate monitor (R-11), the second channel is a radioactive gas monitor (R-12), and the third channel is also a radioactive gas monitor (R-21). The three channels are separated into two trains with channel R-21 designated as Train A and channels R-11 and R-12 designated as Train B

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All changes are 1 unless otherwise noted

Vent

BASES

APPLICABLE SAFETY ANALYSES (continued)

vent

rapid isolation is assumed. The containment purge and exhaust isolation radiation monitors act as backup to the SI signal to ensure closing of the purge and exhaust valves. They are also the primary means for automatically isolating containment in the event of a fuel handling accident during shutdown. Containment isolation in turn ensures meeting the containment leakage rate assumptions of the safety analyses, and ensures that the calculated accidental offsite radiological doses are below 10 CFR 100 (Ref. 1) limits. [Due to radioactive decay, containment is only required to isolate during fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days).] 3

vent, contributes to both, ensuring, control room and, 50.67

vent

The containment purge and exhaust isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment Purge and Exhaust Isolation, listed in Table 3.3.6-1, is OPERABLE.

Vent

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate Containment Purge Isolation at any time by using either of two switches in the control room. Either switch actuates both trains. This action will cause actuation of all components in the same manner as any of the automatic actuation signals. 4

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

1 2. Automatic Actuation Logic and Actuation Relays 4

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

All changes are 1 unless otherwise noted

BASES

LCO (continued)

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b, SI, and ESFAS Function 3.~~a~~, Containment ~~Phase A~~ Isolation. The applicable MODES and specified conditions for the containment purge and vent isolation portion of these Functions are different ~~and less restrictive~~ than those for their ~~Phase A~~ Containment isolation and SI roles. If one or more of the SI or ~~Phase A~~ Containment isolation Functions becomes inoperable in such a manner that only the Containment Purge and Vent Isolation Function is affected, the Conditions applicable to their SI and ~~Phase A~~ Containment isolation Functions need not be entered. The less restrictive Actions specified for inoperability of the Containment Purge and Vent Isolation Functions specify sufficient compensatory measures for this case.

2 ~~3~~. Containment Radiation 4

The LCO specifies ~~four~~ three required channels of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment Purge and Vent Isolation remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY ~~may~~ will also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, ~~if~~ since these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

INSERT 3

INSERT 4

~~4. Containment Isolation - Phase A~~ 4

~~Refer to LCO 3.3.2, Function 3.a., for all initiating Functions and requirements.~~

APPLICABILITY

The ~~Manual Initiation,~~ Automatic Actuation Logic and Actuation Relays~~,~~ ~~Containment Isolation - Phase A,~~ and Containment Radiation Functions are required OPERABLE in MODES 1, 2, 3, and 4, 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)]~~ within containment. 3 Under these conditions, the potential exists for an accident that could release significant fission product radioactivity into containment. Therefore, the containment purge and ~~exhaust~~ vent isolation instrumentation must be OPERABLE in these MODES.

1

INSERT 3

The radioactive gas monitor (R-21) has two flow path alignments; it can be aligned to the 36 inch containment purge exhaust line or to the containment atmosphere via the same penetration used by particulate monitor R-11 and radioactive gas monitor R-12. However, since the 36 inch containment purge exhaust line is isolated and sealed in MODES 1, 2, 3, and 4, for the radioactive gas monitor R-21 to be OPERABLE, it must be aligned to the containment atmosphere via the same containment penetration as the R-11 and R-12 radiation monitors.

4

INSERT 4

3. Containment Isolation – Manual Initiation

   Refer to LCO 3.3.2, Function 3.a, for all initiating Functions and requirements. This Function provides the manual initiation capability for containment ventilation isolation.

4. Containment Spray – Manual Initiation

   Refer to LCO 3.3.2, Function 2.a, for all initiating Functions and requirements. This Function provides the manual initiation capability for containment ventilation isolation.

5. Safety Injection

   Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements. This Function provides both manual and automatic initiation capability for containment ventilation isolation.

1

BASES

APPLICABILITY (continued)

While in MODES 5 and 6 ~~without fuel handling in progress~~, the containment purge and ~~exhaust~~ vent isolation instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within the limits of Reference 1. 4 1

The Applicability for the containment purge and ~~exhaust~~ vent isolation on the ~~ESFAS Containment Isolation-Phase A~~ Containment Isolation – Manual Initiation, Containment Spray – Manual Initiation, and Safety Injection Functions are specified in LCO 3.3.2. Refer to the Bases for LCO 3.3.2 for discussion of the ~~Containment Isolation-Phases A~~ Function Applicability. 1

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 unit specific calibration procedures. 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 COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to 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 3.3.6-1. 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 applies to the failure of one containment ~~purge isolation~~ radiation monitor channel. Since the ~~four~~ three containment radiation monitors measure different parameters, failure of a single channel may result in loss of the radiation monitoring Function for certain events. Consequently, the failed channel must be restored to OPERABLE status. The 4 hours allowed to restore the affected channel is justified by the low likelihood of events occurring during this interval, and recognition that one or more of the remaining channels will respond to most events. 1

BASES

ACTIONS (continued)

B.1

Condition B applies to ~~all Containment Purge and Exhaust Isolation Functions~~ one or more Automatic Actuation Logic and Actuation Relays trains 4 and addresses the train orientation of the ~~Solid State Protection System (SSPS) and the~~ 1 master and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels, or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1.

If a train is inoperable, multiple channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action for the applicable Conditions of LCO 3.6.3 is met for each valve made inoperable by failure of isolation instrumentation.

A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.

C.1 and C.2

Condition C applies to ~~all Containment Purge and Exhaust Isolation Functions~~ one or more Automatic Actuation Logic and Actuation Relays trains 4 and addresses the train orientation of the ~~SSPS and the~~ master 1 and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels, or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1. If a train is inoperable, multiple channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment purge and ~~exhaust~~ vent 1 isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.~~4~~ 6 4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during movement of ~~[recently]~~ 3 irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Purge and ~~Exhaust~~ Vent 1 Isolation Functions.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1

Performance of the CHANNEL CHECK once every 12 hours 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 unit 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.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

~~SR 3.3.6.2~~

~~SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.~~ 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience. 4

[SR 3.3.6.4 2 3 4

SR 3.3.6.4 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 2. 4 test 1

The SR is modified by a Note stating that the Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation.] 3

[SR 3.3.6.5

SR 3.3.6.5 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 2. 4

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the EFAS Instrumentation.]

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.~~6~~ 3 4

A COT is performed every 92 days on each required channel to ensure the entire channel will perform the 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 COT 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 based on the staff recommendation for increasing the availability of 2 radiation monitors according to NUREG-1366 (Ref. 3). This test verifies the capability of the instrumentation to provide the containment purge and ~~exhaust~~ vent system isolation. The Setpoint Control Program (SCP) has controls which require verification 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 setpoint shall be left consistent with the current unit specific calibration procedure tolerance.~~ 1 5 5

~~SR 3.3.6.7~~

~~SR 3.3.6.7 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is acceptable based on instrument reliability and industry operating experience.~~ 4

~~SR 3.3.6.8~~

~~SR 3.3.6.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. 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 TADOT of a relay. This is acceptable because all of the other required contacts of the relay are~~ 4

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).~~

~~The test also includes trip devices that provide actuation signals directly to the SSPS, bypassing the analog process control equipment. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.~~

~~The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~

4

SR 3.3.6.~~9~~ 4

4

A CHANNEL CALIBRATION is performed every ~~[~~18~~]~~ months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The SCP has controls which require verification 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.

3

5

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. ~~10 CFR 100.11~~ 10 CFR 50.67.

2. WCAP-15376, Rev. 0, October 2000.

3. NUREG-1366, ~~[date]~~ December 1992.

1

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6 BASES, CONTAINMENT PURGE AND VENT ISOLATION 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 or licensing basis description.

2. Typographical error corrected.

3. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

4. Changes are made to reflect changes made to the Specification.

5. Changes are made to the ISTS Bases that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.6, CONTAINMENT PURGE AND VENT ISOLATION INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 7

ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

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

A01

ITS

ITS 3.3.7

3.12 CONTROL ROOM POST-ACCIDENT RECIRCULATION SYSTEM

APPLICABILITY

Applies to the OPERABILITY of the Control Room Post-Accident Recirculation System.

OBJECTIVE

To specify OPERABILITY requirements for the Control Room Post-Accident Recirculation System.

M01 Add proposed MODES 3 and 4

SPECIFICATION

M02 Add proposed MODES 5 and 6 and during movement of irradiated fuel assemblies Applicabilities

Applicability

LCO 3.3.7 and Table 3.3.7-1

A02

a. The reactor shall not be made critical unless both trains of the Control Room Post-Accident Recirculation System are OPERABLE.

ACTIONS A and B

b. Both trains of the Control Room Post-Accident Recirculation System, including filters, shall be OPERABLE or the reactor shall be shut down within 12 hours, except that when one of the two trains of the Control Room Post-Accident Recirculation System is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

Add proposed ACTIONS A and B for MODES 1 and 2 operation L01

c. During testing the system shall meet the following performance requirements:

1. The results of the in-place cold DOP and halogenated hydrocarbon tests at design flows on HEPA filter and charcoal adsorber banks shall show ≥ 99% DOP removal and ≥ 99% halogenated hydrocarbon removal.

2. The results of the laboratory carbon sample analysis from the Control Room Post-Accident Recirculation System carbon shall show ≥ 95% radioactive methyl iodide removal when tested in accordance with ASTM D3803-89 at conditions of 30°C, and 95% RH.

3. Fans shall operate within ±10% of design flow when tested.

See ITS 5.5.9

Add proposed ACTIONS A and B for MODES 3 and 4 operation
Add proposed ACTION C
M01

Add proposed ACTIONS A and B for MODES 5 and 6 operation and during movement of irradiated fuel assemblies
Add proposed ACTIONS D and E
M02

Add proposed Table 3.3.7-1 Function 3 requirements
A05

Amendment No. 152
02/28/2001

4.1 OPERATIONAL SAFETY REVIEW

APPLICABILITY

Applies to items directly related to safety limits and LIMITING CONDITIONS FOR OPERATION.

OBJECTIVE

To assure that instrumentation shall be checked, tested, and calibrated, and that equipment and sampling tests shall be conducted at sufficiently frequent intervals to ensure safe operation.

SPECIFICATION

SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.4

a. Calibration, testing, and checking of protective instrumentation channels and testing of logic channels shall be performed as specified in Table TS 4.1-1.

b. Equipment and sampling tests shall be conducted as specified in Table TS 4.1-2 and TS 4.1-3.

See other ITS

c. Deleted

d. Deleted

e. Deleted

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ITS

ITS 3.3.7

A01

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

A04 COT

	CHANNEL DESCRIPTION	CHECK SR 3.3.7.1	CALIBRATE SR 3.3.7.4	~~TEST~~ SR 3.3.7.2	REMARKS
See ITS 3.3.2	18. a. Containment Pressure (SIS signal)	Each shift	Each refueling cycle	Monthly(a)	(a) Isolation Valve Signal
	b. Containment Pressure (Steamline Isolation)	Each shift(a)	Each refueling cycle(a)	Monthly(a)	(a) Narrow range containment pressure (-3.0, +3.0 psig excluded)
	c. Containment Pressure (Containment Spray Act)	Each shift	Each refueling cycle	Monthly	
See ITS 3.6.9	d. Annulus Pressure (Vacuum Breaker)	Not applicable	Each refueling cycle	Each refueling cycle	
Table 3.3.7-1, Function 2	19. Radiation Monitoring System	~~Daily~~ 12 hours ~~(a,b)~~ A03	Each refueling cycle ~~(a)~~	Quarterly ~~(a)~~	~~(a) Includes only channels R11 thru R15, R19, R21, and R23~~ LA01 ~~(b) Channel check required in all plant modes~~ A03
	~~20. Deleted~~ M03				
See ITS 3.4.15	21. Containment Sump Level	Not applicable	Not applicable	Each refueling cycle	
See ITS 3.5.1	22. Accumulator Level and Pressure	Each shift	Deleted	Not applicable	
See ITS 3.3.2	23. Steam Generator Pressure	Each shift	Each refueling cycle	Monthly	

Discussion of Change LA01 is for channel R23. For other channels, see ITS 3.3.2, 3.3.6, 3.4.15, and CTS 3.8.a.9.

M04 Add proposed SR 3.3.7.3

Amendment No. 182
4/06/2005

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Kewaunee Power Station (KPS) 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-1431, Rev. 3.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A02 The CTS does not contain a specific LCO statement for the CRPAR System Actuation Instrumentation or any ACTIONS to take when the CRPAR System Actuation Instrumentation is inoperable. Thus, when any required channels are inoperable, the Actions of the CRPAR System, which the instruments support, must be taken. ITS LCO 3.3.7 and Table 3.3.7-1 provide specific requirements to ensure the CRPAR System Actuation Instrumentation is OPERABLE to support the actuation of the CRPAR System. ITS 3.3.7 ACTIONS (as described in DOCs M01, M02, and L01) provide compensatory actions for inoperable CRPAR System Actuation Instrumentation. This modifies the CTS by providing a specific LCO for the CRPAR System Actuation Instrumentation, providing specific ACTIONS to take as compensatory actions when the required CRPAR System Actuation Instrumentation is inoperable (as described in DOCs M01, M02, and L01).

This change is acceptable because the CRPAR System Actuation Instrumentation provides support for the OPERABILITY of the CRPAR System. The addition of the LCO (including Table) requirements provides specific requirements for each specified instrument. The addition of the ACTIONS is described and justified in DOCs M01, M02, and L01. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS Table TS 4.1-1, Channel Description 19, Remarks Section Note (b) states that the Channel Check is required in all plant modes. ITS SR 3.3.7.1 provides an equivalent CHANNEL CHECK requirement, which is applicable in MODES 1, 2, 3, and 4, and during movement of irradiated fuel assemblies within containment. This changes the CTS by deleting this specific Note.

While the purpose of the Note appears to require the Channel Check requirement to be performed in all plant modes, CTS 4.0.a, which provides the general requirements of all Surveillance Requirements, specifically states that Surveillances are only required to be met during the operational MODES or other specified conditions in the LCO. While it does state that this can be modified as stated in an individual Surveillance, it further states that if the Surveillance is not met, then the actions of the LCO are to be taken. Thus, while this Note appears to require the Channel Check in all plant modes, in actuality, it only is required when the LCO has to be met. Therefore, the deletion of Note (b) is acceptable and considered administrative, since the technical requirements have not been changed.

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

A04 CTS Table TS 4.1-1, Channel Description 19 requires that the Radiation Monitoring System channels be demonstrated OPERABLE by performance of a quarterly channel TEST (i.e., CHANNEL FUNCTIONAL TEST). ITS SR 3.3.7.2 requires the performance of a CHANNEL OPERATIONAL TEST (COT) of the Radiation Monitoring channels. This changes the CTS by changing the CHANNEL FUNCTIONAL TEST requirement to a COT.

This change is acceptable because the COT continues to perform the test similar to the current CHANNEL FUNCTIONAL TEST. The change is one of format only. In addition, the change to the CHANNEL FUNCTIONAL TEST definition is described in the Discussion of Changes in ITS 1.0. Therefore, this change is designated administrative because it does not result in technical changes to the CTS.

A05 CTS 3.12.a does not identify that a Safety Injection (SI) Signal starts the CRPAR System. The SI signal requirements are currently covered by CTS 3.5 and Table TS 3.5-3. ITS Table 3.3.7-1 Function 3 identifies that an SI signal starts the CRPAR System. However, the Table states to refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1 for all initiation functions and requirements. This includes appropriate ACTIONS and Surveillance Requirements. This changes the CTS by identifying that an SI signal is sent to the CRPAR System and affects operation of the CRPAR System.

The purpose of the Table requirement is to identify that the CRPAR does receive an SI signal; however all the requirements associated with this signal, including ACTIONS and Surveillance Requirements, are covered by the LCO 3.3.2 requirements. This change is acceptable and considered administrative since the requirements have not changed; the SI signal requirements associated with the CRPAR System are located in LCO 3.3.2, not ITS 3.3.7, "CRPAR Actuation Instrumentation."

MORE RESTRICTIVE CHANGES

M01 The CTS 3.12.a Applicability of the Control Room Post-Accident Recirculation (CRPAR) System is that the reactor shall not be made critical unless both trains of the CRPAR System are OPERABLE. When one inoperable train is not restored in 7 days, CTS 3.12.b requires the unit to be shutdown (i.e., non-critical or ITS equivalent MODE 3) in 12 hours. Since the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor support OPERABILITY of the CRPAR System, the Applicability of the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor are the same as the CRPAR System – they are only required in the OPERATING and HOT STANDBY MODES (ITS equivalent MODES 1 and 2). ITS Table 3.3.7-1, in part, requires the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor to be OPERABLE in MODES 1, 2, 3, and 4. Consistent with this change in Applicability, the following changes and additions regarding actions taken when one or both trains of the Automatic Actuation Logic and Actuation Relays or the Control Room Vent Radiation Monitor is inoperable: a) When one train of Automatic Actuation Logic

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

and Actuation Relays is inoperable in MODE 3 or 4, ITS 3.3.7 ACTION A will require placing the associated CRPAR train in the emergency mode within 7 days; b) When both trains of Automatic Actuation Logic and Actuation Relays or the Control Room Vent Radiation Monitor is inoperable in MODE 3 or 4, ITS 3.3.7 ACTION B requires either placing one CRPAR train in the emergency mode and declaring the other CRPAR train inoperable (and entering the applicable Conditions and Required Actions of ITS 3.7.10) immediately, or placing both CRPAR trains in the emergency mode immediately; and c) If either ACTION A or B is not met in MODE 3 or 4, or a unit shutdown is required while the unit is in MODE 1 or 2, ITS 3.3.7 Required Action C.2 requires the unit to be in MODE 5 within 36 hours. Furthermore, Required Action C.1 only provides 6 hours to be in MODE 3. This changes the CTS by requiring the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor to be OPERABLE in MODES 3 and 4, providing ACTIONS to take when the instruments are inoperable in MODES 3 and 4, decreases the time to reach subcritical conditions (i.e., MODE 3) from 12 hours to 6 hours, and provides a Required Action (Required Action C.2) to place the unit outside the new Applicability. The addition of the MODES 5 and 6 and during movement of irradiated fuel assemblies Applicability is discussed in DOC M02.

The purpose of CTS 3.12.a is to ensure that the CRPAR System is OPERABLE to provide a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. During accident conditions, the CRPAR System isolates the normal outside air intake supply to the control room and both CRPAR fans are started and the flow path through the emergency filtration system is opened. The addition of MODES 3 and 4 and the associated ACTIONS when in MODES 3 and 4 is acceptable since an accident could occur in these MODES that could cause a release of radioactive material to the environment. Furthermore, the time to reach MODE 3 has been reduced and a new Required Action has been added to place the unit in a MODE outside the new Applicability. This change is acceptable because the Completion Times are 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. Allowing 6 hours to be in MODE 3 and 36 hours to be in MODE 5 ensures a unit shutdown is commenced and completed within a reasonable period of time upon failure to restore the instrumentation to OPERABLE status or place the associated CRPAR trains in operation within the allowed Completion Time. The proposed ACTIONS A and B are acceptable since the proper compensatory measures are provided when the instrumentation is inoperable. In both ACTIONS A and B, the final action to place the CRPAR train in the emergency mode performs the function of the instruments. This change is more restrictive because a new Applicability containing MODE 3 and 4 and associated Required Actions to exit the new Applicability has been added and the time to reach MODE 3 has been reduced.

M02 The CTS does not contain any requirements for the CRPAR System, nor its associated instrumentation (Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor) in MODES 5 and 6 and during

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

movement of irradiated fuel assemblies. ITS Table 3.3.7-1 Functions 1 and 2 Applicability includes MODES 5 and 6 and during movement of irradiated fuel assemblies. Consistent with this change in Applicability, the following additions regarding actions taken when one or both trains of the Automatic Actuation Logic and Actuation Relays or the Control Room Vent Radiation Monitor is inoperable: a) When one train of Automatic Actuation Logic and Actuation Relays is inoperable in MODE 5 or 6 or during movement of irradiated fuel assemblies, ITS 3.3.7 ACTION A will require placing the associated CRPAR train in the emergency mode within 7 days; b) When both trains of Automatic Actuation Logic and Actuation Relays or the Control Room Vent Radiation Monitor is inoperable in MODE 5 or 6 or during movement of irradiated fuel assemblies, ITS 3.3.7 ACTION B requires either placing one CRPAR train in the emergency mode and declaring the other CRPAR train inoperable (and entering the applicable Conditions and Required Actions of ITS 3.7.10) immediately, or placing both CRPAR trains in the emergency mode immediately; c) If either ACTION A or B is not met during movement of irradiated fuel assemblies, ITS 3.3.7 ACTION D requires movement of irradiated fuel assemblies to be suspended immediately; and d) If either ACTION A or B is not met in MODE 5 or 6, ITS 3.3.7 ACTION E requires action to be immediately initiated to restore one CRPAR train to OPERABLE status. This changes the CTS by requiring the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies and by providing ACTIONS to take when the instruments are inoperable in the new Applicability.

The purpose of ITS 3.3.7 is to provide assurance that the CRPAR System Actuation Instrumentation is OPERABLE when required to perform its function. The Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor are required to be OPERABLE in MODES 5 and 6 in order to support the assumptions of the Waste Gas Decay Tank Rupture analysis. The Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor are required to be OPERABLE during movement of irradiated fuel assemblies in order to support the assumptions of the fuel handling accident analysis. This change is acceptable because it provides additional assurance that the Automatic Actuation Logic and Actuation Relays and the Control Room Vent Radiation Monitor are available to perform their function when required. This change is designated as more restrictive because a new Applicability and associated ACTIONS have been added.

M03 CTS Table TS 4.1-1 Channel Description 19 requires a Daily instrument check of the radiation monitoring system. ITS SR 3.3.7.1 requires the performance of a CHANNEL CHECK of the control room vent radiation monitor every 12 hours. This changes the CTS by requiring a check of the control room vent radiation monitor more often in ITS than in CTS.

The purpose of the instrument check is to demonstrate that the required control room vent radiation monitor is OPERABLE and capable of providing an early indication of high radiation conditions in the control room ventilation system. ITS SR 3.3.7.1 provides reasonable confidence that the channel is operating properly. This change is designated more restrictive because less time is

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

allowed between performances of the CHANNEL CHECK than was allowed in the CTS.

M04 CTS 3.12 provides requirements for the CRPAR System, but does not explicitly provide requirements for the Automatic Actuation Logic and Actuation Relays that result in actuation of the CRPAR System. ITS 3.3.7 provides requirements for the Automatic Actuation Logic and Actuation Relays Function (Function 1) to be OPERABLE (as discussed in DOC A02) and provides a Surveillance Requirement (ITS SR 3.3.7.3) to ensure proper functioning of the Automatic Actuation Logic and Actuation Relays. This changes the CTS by providing a Surveillance Requirement to help ensure the Automatic Actuation Logic and Actuation Relays Function for the CRPAR Actuation Instrumentation is OPERABLE.

This change is acceptable because the Automatic Actuation Logic and Actuation Relays Function of the CRPAR Actuation Instrumentation is required to support the OPERABILITY of the CRPAR System. As such, including Surveillance Requirements for the Automatic Actuation Logic and Actuation Relays Function in the Technical Specifications provides additional assurance that the OPERABILITY of the CRPAR System actuation instrumentation will be maintained. The addition of SR 3.3.7.3 (an ACTUATION LOGIC TEST) is acceptable since the actuation logic is through the Engineered Safety Function Actuation System (ESFAS) relay logic and the Frequency is consistent with similar tests in ITS 3.3.2. This change is designated as more restrictive because it adds a SR for the Automatic Actuation Logic and Actuation Relays Function to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* Note (a) to Item 19 of CTS Table TS 4.1-1 in the Remarks Section states that the instrument CHECK, CALIBRATE, and TEST Frequencies for the Radiation Monitoring System are applicable only to channels R11 through R15, R19, R21, and R23. For the CRPAR Actuation Instrumentation Specification, only instrument R23 applies. ITS 3.3.7 does not contain this note. This changes the CTS by removing the description of the applicable channels 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 to perform the instrument CHANNEL CHECK, CHANNEL CALIBRATION , and the CHANNEL OPERABILITY TEST (COT) for the control room vent radiation

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

monitor. 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. The removal of the other Instruments, R11 through R15, R19, and R21, will be discussed in other Discussion of Changes. 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 3.12.b requires, with one train of the Automatic Actuation Logic and Actuation Relays Function inoperable (i.e., the associated CRPAR train is inoperable), to either restore the CRPAR train to OPERABLE status (i.e., by restoring the Automatic Actuation Logic and Actuation Relays train to OPERABLE status) within 7 days or the unit must be shutdown (to HOT SHUTDOWN – ITS equivalent MODE 3) in the next 12 hours. In addition, the CTS does not provide any Actions when both trains of the Automatic Actuation Logic and Actuation Relays Function are inoperable or when the Control Room Vent Radiation Monitor (i.e., both CRPAR trains are inoperable in both cases) in MODES 1 and 2. Thus a unit shutdown (to HOT SHUTDOWN – ITS equivalent MODE 3) is required. ITS 3.3.7 ACTION A allows 7 days to place the associated CRPAR train in the emergency mode when one Automatic Actuation Logic and Actuation Relays train is inoperable. When both Automatic Actuation Logic and Actuation Relays trains are inoperable or the Control Room Vent Radiation Monitor is inoperable, ITS 3.3.7 ACTION B allows either immediately placing one CRPAR train in the emergency mode and declaring the other CRPAR train inoperable (and entering the applicable Conditions and Required Actions of ITS 3.7.10) or immediately placing both CRPAR trains in the emergency mode. If either ACTION A or B is not met, ITS 3.3.7 ACTION C requires shutting down the unit to MODE 3 within 6 hours and MODE 5 within 36 hours. This changes the CTS by allowing the associated CRPAR trains to be placed in the emergency mode in lieu of requiring a unit shutdown. The change in the time to reach the shutdown condition and the requirement to place the unit in MODE 5 is discussed in DOC M01.

The purpose of the requirements for the Automatic Actuation Logic and Actuation Relays Function and the Control Room Vent Radiation Monitor is to ensure the associated CRPAR trains are capable of being automatically placed in the emergency mode. The proposed ACTIONS ensure that the function of each inoperable Automatic Actuation Logic and Actuation Relays train and the inoperable Control Room Vent Radiation Monitor is satisfied by requiring the associated CRPAR train to be placed in the emergency mode, since this places the associated CRPAR train in the post accident operating condition. Alternately, declaring the associated CRPAR train inoperable allows the actions for the CRPAR System to govern the compensatory measures. The ACTIONS are used to establish remedial measures that must be taken in response to degraded conditions in order to minimize risk associated with continued operation. This change is acceptable because the ACTIONS are consistent with safe operation under the specified Condition, considering the status of the associated CRPAR System train(s) (i.e., the associated train(s) are in the post accident operating condition), and the low probability of a DBA occurring during the time period. If the associated train(s) are not placed in the emergency mode or declared inoperable (if allowed), the ITS ACTIONS will require the unit to be shut down, consistent with current requirements. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

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

CTS

All changes are 1 unless otherwise noted

PAR System

3.3 INSTRUMENTATION

Post Accident Recirculation PAR

3.3.7 Control Room Emergency Filtration System (CREFS) Actuation Instrumentation

PAR System

3.12.a LCO 3.3.7 The CREFS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE.

3.12.a, DOC M02 APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each Function.
--- 2

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.12.b, DOCs M01, M02	A. One or more Functions with one channel or train inoperable. Automatic Actuation Logic and Actuation Relay	A.1 --------------NOTE-------------- [Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.] -- associated PAR Place one CREFS train in emergency [radiation protection] mode.	7 days	3 2 4
3.12.b, DOCs M01, M02	B. One or more Functions with two channels or two trains inoperable. Automatic Actuation Logic and Actuation Relay OR Control Room Vent Radiation Monitor inoperable.	--------------------NOTE------------------- [Place in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.] -- PAR B.1.1 Place one CREFS train in emergency [radiation protection] mode. AND	Immediately	3 2 4

CTS

All changes are 1 unless otherwise noted

CREFS Actuation Instrumentation
3.3.7

PAR System

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.12.b, DOCs M01, M02	B.1.2 Enter applicable Conditions and Required Actions for one CREFS train made inoperable by inoperable CREFS actuation instrumentation. (PAR) (PAR System) OR B.2 Place both trains in emergency [radiation protection] mode. (CRPAR)	Immediately Immediately 4
DOC M01 C. Required Action and associated Completion Time for Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
DOC M02 D. Required Action and associated Completion Time for Condition A or B not met during movement of [recently] irradiated fuel assemblies.	D.1 Suspend movement of [recently] irradiated fuel assemblies.	Immediately 4 4
E. [Required Action and associated Completion Time for Condition A or B not met in MODE 5 or 6.	E.1 Initiate action to restore one CREFS train to OPERABLE status. (PAR)	Immediately] 4

CTS

 1

PAR System

SURVEILLANCE REQUIREMENTS

PAR System

--NOTE--
Refer to Table 3.3.7-1 to determine which SRs apply for each CREFS Actuation Function. 1

	SURVEILLANCE		FREQUENCY	
4.1.a, Table TS 4.1-1, Channel Description 19	SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours	
4.1.a, Table TS 4.1-1, Channel Description 19	SR 3.3.7.2	Perform COT. in accordance with the Setpoint Control Program.	92 days	5
	SR 3.3.7.3	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS	6
	SR 3.3.7.4	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS	9
		------------------------------REVIEWER'S NOTE------------------------------ The Frequency of 92 days on a STAGGERED TEST BASIS is applicable to the actuation logic processed through the Relay or Solid State Protection System. ---		7
DOC M04	SR 3.3.7.5 3	------------------------------NOTE------------------------------ This Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. --- Perform ACTUATION LOGIC TEST.	18 months 92 days on a STAGGERED TEST BASIS	10 6

PAR System

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
-------------------------------REVIEWER'S NOTE------------------------------- The Frequency of 92 days on a STAGGERED TEST BASIS is applicable to the master relays processed through the Solid State Protection System. ---			7
SR 3.3.7.6	-------------------------------NOTE------------------------------ This Surveillance is only applicable to the master relays of the ESFAS Instrumentation. -- Perform MASTER RELAY TEST.	92 days on a STAGGERED TEST BASIS	9
SR 3.3.7.7	Perform SLAVE RELAY TEST.	[92] days	9
SR 3.3.7.8	-------------------------------NOTE------------------------------ Verification of setpoint is not required. -- Perform TADOT.	[18] months	8
4.1.a, Table TS 4.1-1, Channel Description 19 — SR 3.3.7.9 4	Perform CHANNEL CALIBRATION.	[18] months	10 4

in accordance with the Setpoint Control Program.

5

CTS

CREFS Actuation Instrumentation 1
3.3.7

PAR System

Table 3.3.7-1 (page 1 of 1)
CREFS Actuation Instrumentation 1

PAR System

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	~~TRIP SETPOINT~~ 3	
	1. Manual Initiation	1, 2, 3, 4, [5, 6], (a)	2 trains	SR 3.3.7.6	NA	8
3.12.a, DOCs M01 and M02	1 → 2. Automatic Actuation Logic and Actuation Relays	1, 2, 3, 4, [5, 6], (a)	2 trains	SR 3.3.7.3 SR 3.3.7.4 SR 3.3.7.5	~~NA~~	8 4 9
3.12.a, DOCs M01 and M02, Table TS 4.1-1 Channel Description 19	2 → 3. ~~Control Room Radiation~~					8
	a. Control Room Atmosphere	1, 2, 3, 4 [5, 6], (a)	[2]	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.7	≤ [2] mR/hr	
	b. Control Room ~~Air Intakes~~ Vent Radiation Monitor	1, 2, 3, 4, [5, 6], (a)	[2] 1	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.7 4	~~≤ [2] mR/hr~~	4 10
DOC A05	3 → 4. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.				8

DOC M02 (a) During movement of ~~[recently]~~ irradiated fuel assemblies. 2

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JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

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

2. Due to the changes made to the Functions in Table 3.3.7-1 (as described in JFD 8), the only Functions remaining in the KPS Table 3.3.7-1 are the Automatic Actuation Logic and Actuation Relays (Function 1), the Control Room Vent Radiation Monitor (Function 2), and the Safety Injection (Function 3) Functions. Furthermore, the Control Room Vent Radiation Monitor has one channel in the KPS design versus two channels in the ISTS Table. ISTS 3.3.7 Conditions A and B were written to apply to those Functions with two channels or trains – ISTS Table 3.3.7-1 Functions 1 (Manual Initiation), 2 (Automatic Actuation Logic and Actuation Relays), 3.a Control Room Atmosphere Radiation), and 3.b (Control Room Air Intakes Radiation). However, for the KPS design, ISTS 3.3.7 Condition A only applies to the Automatic Actuation Logic and Actuation Relays Function. Therefore, for clarity, ITS 3.3.7 Condition A has been changed to state "One Automatic Actuation Logic and Actuation Relay train inoperable." As described above, the KPS design of the Control Room Vent Radiation Monitor Function includes only one channel, and the one channel starts both CRPAR trains. Thus, when the one channel is inoperable, it is equivalent to a both channels of a two channel design being inoperable, and none of the CRPAR trains can be started automatically on a high radiation signal. Therefore, ITS 3.3.7 Condition B has been changed to state, for clarity, "Two Automatic Actuation Logic and Actuation Relays inoperable <u>OR</u> Control Room Vent Radiation Monitor inoperable." For both of these portions of Condition B, none of the Functions will automatically start either of the CRPAR trains. Therefore, the two Conditions provided in ITS 3.3.7 Condition B are equivalent to the single Condition in ISTS 3.3.7 Condition B.

   In addition, due to the changes in Table 3.3.7-1 and the Conditions, there is no need for the ACTIONS Note. The Note allows separate Condition entry for each Function. It was added since Conditions A and B apply to four separate Functions specified in ISTS Table 3.3.7-1. Since the modified Conditions now specify the two KPS Functions that have Actions in ITS 3.3.7, there is no need to specify the allowance in a Note and it has not been included in the KPS ITS.

3. ISTS 3.3.7 Required Action A.1 includes a bracketed Note that requires the CREFS (CRPAR for KPS) train to be placed in the toxic gas protection mode if automatic transfer to the toxic gas protection mode is inoperable. The purpose of the Note, as stated in the ISTS 3.3.7 Bases, is to allow the train to be placed in the toxic gas mode in lieu of the radiation protection mode if the toxic gas mode is simultaneously inoperable. The KPS design does not include a separate toxic gas mode. The CRPAR emergency mode is a recirculation mode where the outside air intake is closed and all air in the control room is recirculated. This type of mode is equivalent to a toxic gas mode, thus the Note is not needed and has been deleted.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

5. Changes are made to the ISTS that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program (SCP). Under this option, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled SCP. The requirements for the SCP are described in ITS Chapter 5, "Administrative Controls," of the Technical Specifications. Therefore, the TRIP SETPOINT column has been deleted from Table 3.3.7-1 of the ITS. In addition, this option requires that each instrument surveillance requirement which verifies a LSSS (both SL and non-SL LSSSs) contain a requirement to perform the surveillance test in accordance with the SCP. Thus, the phrase "in accordance with the Setpoint Control Program" has been added to ITS SR 3.3.7.2 and SR 3.3.7.6.

6. The ISTS contains a Surveillance Requirement (SR) for an ACTUATION LOGIC TEST (ISTS SR 3.3.7.3) for the Automatic Actuation Logic and Actuation Relays Function. The SR Frequency is every 31 days on a STAGGERED TEST BASIS. The ISTS also contains an ACTUATION LOGIC TEST (ISTS SR 3.3.7.5) for the Automatic Actuation Logic and Actuation Relays Function. The specified Frequency is every 92 days on a STAGGERED TEST BASIS. ISTS SR 3.3.7.5 was added to the ISTS as part of the incorporation of TSTF-411, which, in part, increases the surveillance test interval (STI) for the actuation logic and master relays. The basis for the increase in the STI is WCAP-15376-P, Revision 0, which is consistent with the Nuclear Regulatory Commission's (NRC) approach for using probabilistic risk assessment in risk-informed decisions on plant-specific changes to the current licensing basis as presented in Regulatory Guides 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," and 1.177, "An Approach for Plant-Specific, Risk-Informed Decision making: Technical Specifications." KPS has elected to adopt the specific ISTS changes authorized by the results of WCAP-15376-P, Revision 0. Therefore, ISTS SR 3.3.7.5 (ITS SR 3.3.7.3) has been adopted for testing of the Automatic Actuation Logic and Actuation Relays Function. However, the Frequency of the SR has been changed to 18 months (ITS SR 3.3.7.3). At KPS, the SI signal to the CRPAR System is from a slave relay, not a master relay. As discussed in JFD 9, many slave relays cannot be tested online. This includes the one that sends the SI start signal to the CRPAR System. Thus the Frequency for this test is changed to 18 months. Note that the SI signal logic, excluding the slave relay, is required to be tested as part of the ACTUATION LOGIC TEST in SR 3.3.2.2. Thus the majority of the test is being performed every 92 days on a STAGGERED TEST BASIS, consistent with WCAP-15376-P.

7. The Reviewer's Note has been deleted. The information is to alert the NRC reviewer to what is needed to meet this requirement. This information is not meant to be retained in the final version of the plant specific submittal.

8. The design of the KPS CRPAR System is such that there is not a means to perform a manual initiation of the CRPAR System using a single pushbutton. The System is manually started using control switches for the various components.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

Manual initiation of the CRPAR System consists of a manual start of the CRPAR fans by the control room operator via two three-position control switches in the control room (one switch for each train with the switch positions being ON/AUTO/OFF, spring return to AUTO). Therefore, ISTS Table 3.3.7-1 Function 1, Manual Initiation, has not been included in the KPS ITS. This is consistent with the KPS CTS, which does not include a Manual Initiation Function for the CRPAR System. The design of the KPS CRPAR Actuation Instrumentation includes only one radiation monitor, the Control Room Vent Radiation Monitor (R-23). This single monitor starts both trains of the CRPAR System when the associated setpoint is reached. Therefore, ISTS Table 3.3.7-1 Function 3 has been modified to be consistent with the KPS design. Lastly, the Trip Actuating Device Operational Test (TADOT) Surveillance Requirement (ISTS SR 3.3.7.8) has been deleted from ITS 3.3.7, since it is not used by any of the ISTS Functions or KPS ITS Functions.

9. The ISTS contains a Surveillance Requirement (SR) for a MASTER RELAY TEST every 31 days on a STAGGERED TEST BASIS (ISTS SR 3.3.7.4) and a MASTER RELAY TEST every 92 days on a STAGGERED TEST BASIS (ISTS SR 3.3.7.6). ISTS SR 3.3.7.6 was added to the ISTS as part of the incorporation of TSTF-411, which, in part, increases the surveillance test interval for the master relays. The ISTS also contains a SR for a SLAVE RELAY TEST every 92 days (ISTS SR 3.3.7.7). These Surveillance Requirements are not included in the KPS ITS.

   This is acceptable because in response to Generic Letter 96-01 “Testing of Safety-Related Logic Circuits” KPS verified that the appropriate relays, contacts, and wiring runs were being tested for “overlap”. The results of this effort were changes and enhancements to KPS procedures to ensure every aspect of the Safety Related Logic Circuits were being tested. The Master and Slave relays that can be checked online without affecting safety and reliability are checked during the Actuation Logic Test (ALT). The remaining portions of the circuits that cannot be checked during the Actuation Logic Test are checked by various other procedures when plant conditions allow for the safe and reliable testing of these portions. All of this was documented in the KPS response to Generic Letter 96-01.

   KPS design does not allow for monthly or quarterly testing of the Master Relays and Slave Relays in a separate test. Kewaunee design does not include special test circuitry that would allow convenient testing of all relays. To successfully test all of the master and slave relays, very intrusive test setups would be required that in and of themselves would jeopardize the safety of the maintenance personnel (installing temporary jumpers in energized cabinets) and could jeopardize the safety and reliability of the nuclear plant (inadvertent initiation of containment spray or safety injection, etc.).

   ESFAS relay logic test circuit design for Westinghouse 2-loop plants of KPS vintage generally consists of input relays, latching relays (master), non-latching relays (slave) and test relays. When ESF is placed in test for Actuation Logic Testing (ALT), the test relay contacts block energizing of any master or slave relays whose contacts are connected to external equipment actuation circuits for the entire train. This precludes inadvertent initiation of SI or Containment Spray etc. All master and slave relays whose contacts remain within the logic are

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

allowed to energize as each input relay matrix is made up. The relays that are allowed to energize or those blocked is unique to each logic function, based on circuit design. There is a continuity check feature for each master or slave relay coil circuit that is blocked when in test.

In a letter from Wisconsin Public Service to the NRC dated April 19, 1996 in response to Generic Letter 96-01 and subsequently accepted in a letter from the NRC dated January 14, 1999, WPSC states and the NRC accepts that:

> "The Kewaunee Nuclear Power Plant began construction in the late 1960's and received its operating license in 1973. As such the design does not include the same capabilities for testing as the more recently licensed plants. The limitations in the testing capability were recognized and acknowledged during original plant licensing and during development of the plant technical specifications. The original plant NRC safety evaluation report (Reference 4) reviewed and accepted the design and periodic testing practices for the ESF logic circuits." An excerpt from that evaluation report is repeated below:
>
> "…test capability of the ESF logic circuitry beyond the master relays with the plant at power is limited. Testing of the logic master relay must be accomplished by blocking the slave relays which normally actuate the engineered safety features. Periodic testing of the slave relays and actuated relays will be limited to checking relay coil resistance and actuated device circuitry for continuity. This design does not meet the recently approved safety guide criterion on the subject. However, we consider that backfitting the system would not provide substantial additional protection to the public health and safety and, hence, is not warranted. The applicant's capability to test, as described, is consistent with designs recently approved for operating licenses. We have concluded that the testing capability for the Kewaunee plant is acceptable."

WPSC has concluded that this testing meets the technical specification requirements, and, in response to question 23 of enclosure 3 to the acceptance letter from the NRC to WPSC in response to letters concerning Generic Letter 96-01, dated January 14, 1999, the NRC concluded that previously accepted testing practices would continue to remain acceptable."

Therefore, all master and slave relays in ESF that can be safely checked online and do not pose a significant risk to plant reliability are checked during the performance of the Actuation Logic Test (ALT). The remainder of the Master and Slave Relays are checked by actual equipment operation when the plant conditions are such that it does not significantly affect safety and reliability in the plant. KPS currently tests and meets the requirements of Generic Letter 96-01 and the inclusion of specific Master or Slave Relay Testing would be intrusive and/or affect safety and reliability due to the design of KPS. This was acknowledged in the original plant NRC SER, a letter from WPSC to the NRC dated April 19, 1996 in regard to Generic Letter 96-01, and the acceptance letter from the NRC to WPSC dated January 14, 1999 in regard to Generic Letter 96-01. KPS testing of the Master and Slave Relays is limited and plant design does not allow for safely and reliably performing separate Master and Slave Relay Testing surveillances.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

10. Due to the SR deletions discussed in JFDs 6, 8, and 9, the SRs have been renumbered.

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

All changes are 1 unless otherwise noted

B 3.3 INSTRUMENTATION

B 3.3.7 Control Room Emergency Filtration System (CREFS) Actuation Instrumentation

Post Accident Recirculation PAR

BASES

PAR System

BACKGROUND

The CREFS provides an enclosed control room environment from which the unit can be operated following an uncontrolled release of radioactivity. ~~During normal operation, the Auxiliary Building Ventilation System provides control room ventilation.~~ Upon receipt of an actuation signal, ~~the CREFS initiates filtered ventilation and pressurization of the control room.~~ This system is described in the Bases for LCO 3.7.10, "Control Room ~~Emergency Filtration~~ System."

INSERT 1

INSERT 2

Post Accident Recirculation (CRPAR)

a single

INSERT 3

The actuation instrumentation consists of ~~redundant~~ radiation monitor~~s~~ ~~in the air intakes and control room area.~~ A high radiation signal from ~~any of~~ the~~se~~ detector~~s~~ will initiate both trains of the CREFS. The control room operator can also ~~initiate CREFS trains~~ by manual switches in the control room. The CREFS is also actuated by a safety injection (SI) signal. The SI Function is discussed in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation."

start the CRPAR fan(s)

PAR System

APPLICABLE SAFETY ANALYSES

The control room must be kept habitable for the operators stationed there during accident recovery and post accident operations.

PAR System

normal

INSERT 4

The CREFS acts to terminate the supply of unfiltered outside air to the control room, ~~initiate filtration, and pressurize the control room.~~ These actions are necessary to ensure the control room is kept habitable for the operators stationed there during accident recovery and post accident operations by minimizing the radiation exposure of control room personnel.

PAR System

In MODES 1, 2, 3, and 4, the radiation monitor actuation of the CREFS is a backup for the SI signal actuation. This ensures initiation of the CREFS during a loss of coolant accident or steam generator tube rupture.

when an initiation of SI is anticipated. In addition, the radiation monitor actuation of the CRPAR System is the primary means to ensure control room habitability in the event of a locked rotor accident

PAR System

is

2 3

The radiation monitor actuation of the CREFS in MODES 5 and 6, and during movement of ~~[recently]~~ irradiated fuel assemblies ~~are~~ the primary means to ensure control room habitability in the event of a fuel handling or waste gas decay tank rupture accident.

, volume control tank,

PAR System

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

1

INSERT 1

The CRPAR System is part of the Control Room Air Conditioning System. During normal unit operation, the Control Room Air Conditioning System provides cooling and heating of recirculated and fresh air to ventilate the control room.

1

INSERT 2

both CRPAR fans are started, the flow path through the Emergency Filtration System is opened, and a portion of the return air volume is filtered to remove airborne contaminants and airborne radioactivity, then mixed with the recirculated return air.

1

INSERT 3

(R-23) located on the common discharge of the outlet of the air conditioning fan units.

1

INSERT 4

both CRPAR fans are started, the flow path through the emergency filtration system is opened, and a portion of the return air volume is filtered to remove airborne contaminants and airborne radioactivity, then mixed with the recirculated return air.

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All changes are 1 unless otherwise noted

PAR System

BASES

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CREFS is OPERABLE.

PAR System

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the CREFS at any time by using either of two switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

4

1 2. Automatic Actuation Logic and Actuation Relays 4

The LCO requires two trains of Actuation Logic and Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b., SI, in LCO 3.3.2. The applicable MODES and specified conditions for the CREFS portion of these functions are different ~~and less restrictive~~ than those specified for their SI roles. If one or more of the SI functions becomes inoperable in such a manner that only the CREFS function is affected, the Conditions applicable to their SI function need not be entered. The less restrictive Actions specified for inoperability of the CREFS Functions specify sufficient compensatory measures for this case.

and include the slave relays that send the SI signal to the CRPAR System

PAR System

Vent

Monitor

2 3. Control Room Radiation

one

The LCO specifies ~~two~~ required Control Room Atmosphere Radiation Monitors and two required Control Room Air Intake Radiation Monitors to ensure that the radiation monitoring instrumentation necessary to initiate the CREFS remains OPERABLE.

Vent

4

PAR System

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

All changes are 1 unless otherwise noted

PAR System

BASES

LCO (continued)

3 4. Safety Injection 4

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

APPLICABILITY

PAR

The CREFS Functions must be OPERABLE in MODES 1, 2, 3, 4, and during movement of [recently] irradiated fuel assemblies. The Functions must also be OPERABLE in MODES [5 and 6] when required for a waste gas decay tank rupture accident, to ensure a habitable environment for the control room operators. 2

PAR

The Applicability for the CREFS actuation on the ESFAS Safety Injection Functions are specified in LCO 3.3.2. Refer to the Bases for LCO 3.3.2 for discussion of the Safety Injection Function Applicability.

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 unit specific calibration procedures. 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 COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

~~A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.7-1 in the accompanying LCO. 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.~~ 4

A.1

Automatic

and Actuation Relays

PAR System

Condition A applies to the ~~actuation~~ ~~logic~~ ~~train~~ Function of the CREFS, the radiation monitor channel Functions, and the manual channel Functions. 4

All changes are 1 unless otherwise noted

PAR System

BASES

ACTIONS (continued)

If one train is inoperable, or one radiation monitor channel is inoperable in one or more Functions, 7 days are permitted to restore it to OPERABLE status. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this Completion Time is the same as provided in LCO 3.7.10. If the channel/train cannot be restored to OPERABLE status, one CREFS train must be placed in the emergency radiation protection mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation. 4

PAR 4 the associated 4

The Required Action for Condition A is modified by a Note that requires placing one CREFS train in the toxic gas protection mode instead of the [radiation protection] mode of operation if the automatic transfer to toxic gas protection mode is inoperable. This ensures the CREFS train is placed in the most conservative mode of operation relative to the OPERABILITY of the associated actuation instrumentation. 4

B.1.1, B.1.2, and B.2

Automatic Logic and Actuation Relay

or the Control Room Vent Radiation Monitor

Condition B applies to the failure of two CREFS actuation trains, two radiation monitor channels, or two manual channels. The first Required Action is to place one CREFS train in the emergency [radiation protection] mode of operation immediately. This accomplishes the actuation instrumentation Function that may have been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.10 must also be entered for the CREFS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed upon train inoperability as discussed in the Bases for LCO 3.7.10. 4 2 5

PAR PAR and not placed in the emergency mode of operation

CRPAR

Alternatively, both trains may be placed in the emergency [radiation protection] mode. This ensures the CREFS function is performed even in the presence of a single failure. 2

PAR

The Required Action for Condition B is modified by a Note that requires placing one CREFS train in the toxic gas protection mode instead of the [radiation protection] mode of operation if the automatic transfer to toxic gas protection mode is inoperable. This ensures the CREFS train is placed in the most conservative mode of operation relative to the OPERABILITY of the associated actuation instrumentation. 4

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BASES

ACTIONS (continued)

<u>C.1 and C.2</u>

Condition C applies when the Required Action and associated Completion Time for Condition A or B have not been met and the unit is in MODE 1, 2, 3, or 4. The unit must be brought to a MODE in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

<u>D.1</u>

Condition D applies when the Required Action and associated
Completion Time for Condition A or B have not been met when ~~[recently]~~ 2
irradiated fuel assemblies are being moved. Movement of ~~[recently]~~ 2
irradiated fuel assemblies must be suspended immediately to reduce the
risk of accidents that would require CR~~EFS~~ actuation. 1
PAR System

<u>E.1</u>

Condition E applies when the Required Action and associated Completion Time for Condition A or B have not been met in MODE 5 or 6. Actions must be initiated to restore the inoperable train(s) to OPERABLE status immediately to ensure adequate isolation capability in the event of a waste gas decay tank rupture.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1
determines which SRs apply to which CR~~EFS~~ Actuation Functions. 1
PAR System

<u>SR 3.3.7.1</u>

Performance of the CHANNEL CHECK once every 12 hours 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.

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 1

PAR System

BASES

SURVEILLANCE REQUIREMENTS (continued)

Agreement criteria are determined by the unit 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.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

<u>SR 3.3.7.2</u>

A COT is performed once every 92 days on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CREFS PAR 1 actuation. 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 COT 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 setpoints shall be left consistent with the unit specific calibration procedure tolerance.~~ 6 The Frequency is based on the known reliability of the monitoring equipment and has been shown to be INSERT 5 acceptable through operating experience.

~~<u>SR 3.3.7.3</u>~~

~~SR 3.3.7.3 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is acceptable based on instrument reliability and industry operating experience.~~ 4

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6

INSERT 5

The Setpoint Control Program (SCP) has controls which require verification 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

PAR System

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.4

SR 3.3.7.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is acceptable based on instrument reliability and industry operating experience. 4

For the portion of the logic common to ESFAS, Function 1.b ACTUATION LOGIC TEST, the

[SR 3.3.7.5 3 2 4

SR 3.3.7.5 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadequate actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed ever 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 1.

test

inadvertent

and 3

SI

1

For the portion of the logic not tested as part of the ESFAS Function 1.b ACTUATION LOGIC TEST (i.e., the slave relay), actuation of the end devices may occur. The Frequency of 18 months is based on the refueling outage cycle, since the slave relay cannot be tested at power without resulting in actuation of affected components.

4

The SR is modified by a Note stating that the Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation.] 2

[SR 3.3.7.6

SR 3.3.7.6 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 1. 4

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the ESFAS Instrumentation.]

PAR System

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.7

SR 3.3.7.7 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is acceptable based on instrument reliability and industry operating experience. 4

SR 3.3.7.8

SR 3.3.7.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. 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 TADOT 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 some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). 4

The test also includes trip devices that provide actuation signals directly to the Solid State Protection System, bypassing the analog process control equipment. The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

PAR System

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.9 4

4

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

2

INSERT 6

6

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. WCAP-15376, Rev. 0, October 2000.

6

INSERT 6

The SCP has controls which require verification 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

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7 BASES, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR)
SYSTEM ACTUATION INSTRUMENTATION

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

2. The ISTS Bases contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

3. Typographical/grammatical error corrected.

4. Changes are made to reflect changes made to the Specification.

5. Changes made to be consistent with the actual Specification.

6. Changes are made to the ISTS Bases that reflect the adoption of proposed Revision 4 of TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions". Three options are provided for licensees to pursue when adopting TSTF-493. Kewaunee Power Station (KPS) has elected to implement TSTF-493 via the use of a Setpoint Control Program. Under this adoption strategy, KPS relocates the Technical Specification Section 3.3, "Instrumentation," Limiting Trip Setpoints, Nominal Trip Setpoints, and/or Allowable Values from the Technical Specifications to a licensee-controlled Setpoint Control Program. The requirements for the Setpoint Control Program will be described in Chapter 5, "Administrative Controls," of the Technical Specifications.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.7, CONTROL ROOM POST ACCIDENT RECIRCULATION (CRPAR) SYSTEM ACTUATION INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 8

RELOCATED/DELETED CURRENT TECHNICAL SPECIFICATIONS

CTS 3.11, CORE SURVEILLANCE INSTRUMENTATION

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

CTS 3.11

3.11 CORE SURVEILLANCE INSTRUMENTATION

APPLICABILITY

Applies to the operability of the movable detector instrumentation system and the core thermocouple instrumentation system.

OBJECTIVE

To specify operability requirements for the movable detector and core thermocouple systems.

R01

SPECIFICATIONS

a. The movable detector system shall be operable following the initial fuel loading and each subsequent reloading and the power distribution confirmed before the reactor is operated at >75% power. If the system is not completely operable, the measurement error allowance due to incomplete mapping shall be substantiated by the licensee.

b. A minimum of 2 movable detector thimbles per quadrant, and sufficient detectors, drives, and readout equipment to map these thimbles, shall be available during re-calibration of the excore axial offset detection system.

R01

c. A minimum of 4 thermocouples per quadrant shall be available for readout if the reactor is operated above 85% with one excore nuclear power channel out of service.

See ITS 3.3.3

d. The licensee shall utilize his best effort to maintain the movable detector system and the core thermocouple system in an operable state so that surveillance of the core power distribution may be performed. If more than one half of either

R01

CTS 3.11

~~system is inoperable for 7 consecutive days of power operation, the Commission shall be informed within 30 days. Additional reports of the status of the systems shall be made every 30 days until the system is repaired. Power operation may be continued until the next refueling period provided best efforts are utilized to restore the operability of the system or systems.~~

R01

~~BASIS~~

~~The moveable detector system is used to measure the core fission power density distribution. A power map made with this system following each fuel loading will confirm the proper fuel arrangement within the core. The moveable detector system is designed with substantial redundancy so that part of the system could be out of service without reducing the value of a power map. If the system is severely degraded, large measurement uncertainty factors must be applied. The uncertainty factors would necessarily depend on the operable configuration.~~

~~Two detector thimbles per quadrant are sufficient to provide data for the normalization of the excore detector system's axial power offset feature.~~

~~The core thermocouples provide an independent means of measuring the balance of power among the core quadrants. If one excore power channel is out of service, it is prudent to have available an independent means of determining the quadrant power balance.~~

~~The moveable detector system and the thermocouple system are not integral parts of the Reactor Protection System. These systems are, rather, surveillance systems which may be required~~

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DISCUSSION OF CHANGES
CTS 3.11, CORE SURVEILLANCE INSTRUMENTATION

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3.11, 3.11.a, 3.11.b, and 3.11.d ensure the OPERABILITY of movable incore detector instrumentation when required to monitor the flux distribution within the core. The instrumentation is used for periodic Surveillance of the reactor core power distribution, and calibration of the excore neutron flux detectors, but is not assumed in any design basis accident (DBA) analysis and does not mitigate an accident. This Specification does not meet the criteria for retention in the Improved Technical Specifications (ITS); therefore, it will be retained in the Technical Requirements Manual (TRM).

This change is acceptable because CTS 3.11, 3.11.a, 3.11.b, and 3.11.d does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

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

1. The movable incore detectors are not used to detect and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. The Movable Incore Detectors Specification does not satisfy criterion 1.

2. The movable incore detectors are 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 presents a challenge to the integrity of a fission product barrier. The Movable Incore Detectors Specification does not satisfy criterion 2.

3. The movable incore detectors are not a structure, system, or component that is part of the primary success path and 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. The Movable Incore Detectors Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-12) and summarized in Table 1 of WCAP-11618, the loss of movable incore detectors was found to be a non-significant risk contributor to core damage frequency and offsite releases. Dominion Energy Kewaunee (DEK) has reviewed this evaluation, considers it applicable to Kewaunee Power Station (KPS), and concurs with the assessment. The Movable Incore Detectors Specification does not satisfy criterion 4.

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DISCUSSION OF CHANGES
CTS 3.11, CORE SURVEILLANCE INSTRUMENTATION

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Movable Incore Detectors LCO may be relocated out of the Technical Specifications. The Movable Incore Detectors Specification 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 Specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3.11, CORE SURVEILLANCE INSTRUMENTATION

There are no specific NSHC discussions for this Specification.

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ATTACHMENT 9

Improved Standard Technical Specifications (ISTS) Not Adopted in the Kewaunee Power Station ITS

ISTS 3.3.8, FUEL BUILDING AIR CLEANUP SYSTEM (FBACS) ACTUATION INSTRUMENTATION

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

3.3 INSTRUMENTATION

3.3.8 Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation

LCO 3.3.8 The FBACS actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

---NOTES---

1. LCO 3.0.3 is not applicable.

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one FBACS train in operation.	7 days
B. One or more Functions with two channels or two trains inoperable.	B.1.1 Place one FBACS train in operation.	Immediately
	AND	
	B.1.2 Enter applicable Conditions and Required Actions of LCO 3.7.13, "Fuel Building Air Cleanup System (FBACS)," for one train made inoperable by inoperable actuation instrumentation.	Immediately
	OR	
	B.2 Place both trains in emergency [radiation protection] mode.	Immediately

1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time for Condition A or B not met during movement of [recently] irradiated fuel assemblies in the fuel building.	C.1	Suspend movement of [recently] irradiated fuel assemblies in the fuel building.	Immediately
D. [Required Action and associated Completion Time for Condition A or B not met in MODE 1, 2, 3, or 4.	D.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	D.2	Be in MODE 5.	36 hours]

1

SURVEILLANCE REQUIREMENTS

---NOTE---

Refer to Table 3.3.8-1 to determine which SRs apply for each FBACS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2	Perform COT.	92 days
SR 3.3.8.3	[Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS]
SR 3.3.8.4	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	[18] months

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.5	Perform CHANNEL CALIBRATION.	[18] months

1

Table 3.3.8-1 (page 1 of 1)
FBACS Actuation Instrumentation

FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1. Manual Initiation	[1,2,3,4], (a)	2	SR 3.3.8.4	NA
2. [Automatic Actuation Logic and Actuation Relays	1,2,3,4, (a)	2 trains	SR 3.3.8.3	NA]
3. Fuel Building Radiation				
a. Gaseous	[1,2,3,4], (a)	[2]	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5	≤ [2] mR/hr
b. Particulate	[1,2,3,4], (a)	[2]	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.5	≤ [2] mR/hr

(a) During movement of [recently] irradiated fuel assemblies in the fuel building.

1

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JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.8, FUEL BUILDING AIR CLEANUP SYSTEM (FBACS) ACTUATION INSTRUMENTATION

1. ISTS 3.3.8, "Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation," is not included in the Kewaunee Power Station (KPS) ITS. KPS does not take credit for the Fuel Pool Sweep System in the Design Basis Accident analyses and therefore, this Specification is not included in the ITS.

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

B 3.3 INSTRUMENTATION

B 3.3.8 Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation

BASES

BACKGROUND

The FBACS ensures that radioactive materials in the fuel building atmosphere following a fuel handling accident [involving handling recently irradiated fuel] or a loss of coolant accident (LOCA) are filtered and adsorbed prior to exhausting to the environment. The system is described in the Bases for LCO 3.7.13, "Fuel Building Air Cleanup System." The system initiates filtered ventilation of the fuel building automatically following receipt of a high radiation signal (gaseous or particulate) or a safety injection (SI) signal. Initiation may also be performed manually as needed from the main control room.

High gaseous and particulate radiation, each monitored by either of two monitors, provides FBACS initiation. Each FBACS train is initiated by high radiation detected by a channel dedicated to that train. There are a total of two channels, one for each train. Each channel contains a gaseous and particulate monitor. High radiation detected by any monitor or an SI signal from the Engineered Safety Features Actuation System (ESFAS) initiates fuel building isolation and starts the FBACS. These actions function to prevent exfiltration of contaminated air by initiating filtered ventilation, which imposes a negative pressure on the fuel building. Since the radiation monitors include an air sampling system, various components such as sample line valves, sample line heaters, sample pumps, and filter motors are required to support monitor OPERABILITY. 1

APPLICABLE SAFETY ANALYSES

The FBACS ensures that radioactive materials in the fuel building atmosphere following a fuel handling accident [involving handling recently irradiated fuel] or a LOCA are filtered and adsorbed prior to being exhausted to the environment. This action reduces the radioactive content in the fuel building exhaust following a LOCA or fuel handling accident so that offsite doses remain within the limits specified in 10 CFR 100 (Ref. 1).

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

LCO

The LCO requirements ensure that instrumentation necessary to initiate the FBACS is OPERABLE.

BASES

LCO (continued)

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the FBACS at any time by using either of two switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Actuation Logic and Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b., SI, in LCO 3.3.2. The applicable MODES and specified conditions for the FBACS portion of these functions are different and less restrictive than those specified for their SI roles. If one or more of the SI functions becomes inoperable in such a manner that only the FBACS function is affected, the Conditions applicable to their SI function need not be entered. The less restrictive Actions specified for inoperability of the FBACS functions specify sufficient compensatory measures for this case. 1

3. Fuel Building Radiation

The LCO specifies two required Gaseous Radiation Monitor channels and two required Particulate Radiation Monitor channels to ensure that the radiation monitoring instrumentation necessary to initiate the FBACS remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, filter motor operation, detector OPERABILITY, if these supporting features are necessary for actuation to occur under the conditions assumed by the safety analyses.

BASES

LCO (continued)

Only the Trip Setpoint is specified for each FBACS Function in the LCO. The Trip Setpoint limits account for instrument uncertainties, which are defined in the Unit Specific Setpoint Calibration Procedure (Ref. 2).

APPLICABILITY

The manual FBACS initiation must be OPERABLE in MODES [1, 2, 3, and 4] and when moving [recently] irradiated fuel assemblies in the fuel building, to ensure the FBACS operates to remove fission products associated with leakage after a LOCA or a fuel handling accident [involving handling recently irradiated fuel]. The automatic FBACS actuation instrumentation is also required in MODES [1, 2, 3, and 4] to remove fission products caused by post LOCA Emergency Core Cooling Systems leakage.

High radiation initiation of the FBACS must be OPERABLE in any MODE during movement of [recently] irradiated fuel assemblies in the fuel building to ensure automatic initiation of the FBACS when the potential for the limiting fuel handling accident exists. [Due to radioactive decay, the FBACS instrumentation is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days).] 1

While in MODES 5 and 6 without fuel handling [involving handling recently irradiated fuel] in progress, the FBACS instrumentation need not be OPERABLE since a fuel handling accident [involving handling recently irradiated fuel] cannot occur.

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 unit specific calibration procedures. 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 COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

BASES

ACTIONS (continued)

A second Note has been added to 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 3.3.8-1 in the accompanying LCO. 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 applies to the actuation logic train function of the Solid State Protection System (SSPS), the radiation monitor functions, and the manual function. Condition A applies to the failure of a single actuation logic train, radiation monitor channel, or manual channel. If one channel or train is inoperable, a period of 7 days is allowed to restore it to OPERABLE status. If the train cannot be restored to OPERABLE status, one FBACS train must be placed in operation. This accomplishes the actuation instrumentation function and places the unit in a conservative mode of operation. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this time is the same as that provided in LCO 3.7.13. 1

B.1.1, B.1.2, B.2

Condition B applies to the failure of two FBACS actuation logic trains, two radiation monitors, or two manual channels. The Required Action is to place one FBACS train in operation immediately. This accomplishes the actuation instrumentation function that may have been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.13 must also be entered for the FBACS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed on train inoperability as discussed in the Bases for LCO 3.7.13.

Alternatively, both trains may be placed in the emergency [radiation protection] mode. This ensures the FBACS Function is performed even in the presence of a single failure.

BASES

ACTIONS (continued)

C.1

Condition C applies when the Required Action and associated Completion Time for Condition A or B have not been met and [recently] irradiated fuel assemblies are being moved in the fuel building. Movement of [recently] irradiated fuel assemblies in the fuel building must be suspended immediately to eliminate the potential for events that could require FBACS actuation.

D.1 and D.2

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met and the unit is in MODE 1, 2, 3, or 4. The unit must be brought to a MODE in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

1

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that table 3.3.8-1 determines which SRs apply to which FBACS Actuation Functions.

SR 3.3.8.1

Performance of the CHANNEL CHECK once every 12 hours 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 unit 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.8.2

A COT is performed once every 92 days on each required channel to ensure the entire channel will perform the 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 COT 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 the capability of the instrumentation to provide the FBACS actuation. The setpoints shall be left consistent with the unit specific calibration procedure tolerance. The Frequency of 92 days is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience. 1

SR 3.3.8.3

[SR 3.3.8.3 is the performance of an ACTUATION LOGIC TEST. The actuation logic is tested every 31 days on a STAGGERED TEST BASIS. All possible logic combinations, with and without applicable permissives, are tested for each protection function. The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.]

SR 3.3.8.4

SR 3.3.8.4 is the performance of a TADOT. This test is a check of the manual actuation functions and is performed every [18] months. Each manual actuation function is tested up to, and including, the master relay coils. 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 TADOT 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

Specifications tests at least once per refueling interval with applicable extensions. In some instances, the test includes actuation of the end device (e.g., pump starts, valve cycles, etc.). The Frequency is based on operating experience and is consistent with the typical industry refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

SR 3.3.8.5

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. 10 CFR 100.11.

2. Unit Specific Setpoint Calibration Procedure. 1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.8 BASES, FUEL BUILDING AIR CLEANUP SYSTEM (FBACS) ACTUATION INSTRUMENTATION

1. ISTS B 3.3.8, "Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation," is not included in the Kewaunee Power Station (KPS) ITS. KPS does not take credit for the Fuel Pool Sweep System in the Design Basis Accident analyses and therefore, this Specification is not included in the ITS.

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ISTS 3.3.9, BORON DILUTION PROTECTION SYSTEM (BDPS)

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

3.3 INSTRUMENTATION

3.3.9 Boron Dilution Protection System (BDPS)

LCO 3.3.9 Two trains of the BDPS shall be OPERABLE.

APPLICABILITY: MODES [2,] 3, 4, and 5.

---NOTE---
The boron dilution flux doubling signal may be blocked in MODES 2 and 3 during reactor startup.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One train inoperable.	A.1	Restore train to OPERABLE status.	72 hours 1
B. Two trains inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1	--------------NOTE-------------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. ------------------------------------ Suspend operations involving positive reactivity additions.	 Immediately
	<u>AND</u>		
	B.2.1	Restore one train to OPERABLE status. <u>OR</u>	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.2.2.1 Close unborated water source isolation valves. AND B.2.2.2 Perform SR 3.1.1.1.	1 hour 1 hour AND Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.9.2	Perform COT.	[184] days
SR 3.3.9.3	-----------------------------NOTE----------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	[18] months

1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.9, BORON DILUTION PROTECTION SYSTEM (BDPS)

1. ISTS 3.3.9, "Boron Dilution Protection System (BDPS)," is not included in the Kewaunee Power Station (KPS) ITS. KPS does not have a Boron Dilution Protection System.

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

B 3.3 INSTRUMENTATION

B 3.3.9 Boron Dilution Protection System (BDPS)

BASES

BACKGROUND	The primary purpose of the BDPS is to mitigate the consequences of the inadvertent addition of unborated primary grade water into the Reactor Coolant System (RCS) when the reactor is in a shutdown condition (i.e., MODES 2, 3, 4, and 5). The BDPS utilizes two channels of source range instrumentation. Each source range channel provides a signal to both trains of the BDPS. A unit computer is used to continuously record the counts per minute provided by these signals. At the end of each minute, an algorithm compares the counts per minute value (flux rate) of that 1 minute interval with the counts per minute value for the previous nine, 1 minute intervals. If the flux rate during a 1 minute interval is greater than or equal to twice the flux rate during any of the prior nine 1 minute intervals, the BDPS provides a signal to initiate mitigating actions. Upon detection of a flux doubling by either source range instrumentation train, an alarm is sounded to alert the operator and valve movement is automatically initiated to terminate the dilution and start boration. Valves that isolate the refueling water storage tank (RWST) are opened to supply 2000 ppm borated water to the suction of the charging pumps, and valves which isolate the Chemical and Volume Control System (CVCS) are closed to terminate the dilution. 1
APPLICABLE SAFETY ANALYSES	The BDPS senses abnormal increases in source range counts per minute (flux rate) and actuates CVCS and RWST valves to mitigate the consequences of an inadvertent boron dilution event as described in FSAR, Chapter 15 (Ref. 1). The accident analyses rely on automatic BDPS actuation to mitigate the consequences of inadvertent boron dilution events. The BDPS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	LCO 3.3.9 provides the requirements for OPERABILITY of the instrumentation and controls that mitigate the consequences of a boron dilution event. Two redundant trains are required to be OPERABLE to provide protection against single failure.

BASES

LCO (continued)

Because the BDPS utilizes the source range instrumentation as its detection system, the OPERABILITY of the detection system, (i.e., the flux doubling algorithm, the alarms, and signals to the various valves) for one SRM is also required for each train in the system to be considered OPERABLE. Therefore, with both SRMs inoperable for supporting the BDPS, both trains are inoperable.

APPLICABILITY

The BDPS must be OPERABLE in MODES [2], 3, 4, and 5 because the safety analysis identifies this system as the primary means to mitigate an inadvertent boron dilution of the RCS.

The BDPS OPERABILITY requirements are not applicable in MODE[S] 1 [and 2] because an inadvertent boron dilution would be terminated by a source range trip, a trip on the Power Range Neutron Flux - High (low setpoint nominally 25% RTP), or Overtemperature ΔT. These RTS Functions are discussed in LCO 3.3.1, "RTS Instrumentation."

In MODE 6, a dilution event is precluded by locked valves that isolate the RCS from the potential source of unborated water (according to LCO 3.9.2, "Unborated Water Source Isolation Valves").

The Applicability is modified by a Note that allows the boron dilution flux doubling signal to be blocked during reactor startup in MODES 2 and 3. Blocking the flux doubling signal is acceptable during startup while in MODE 3, provided the reactor trip breakers are closed with the intent to withdraw rods for startup. 1

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 unit specific calibration procedure. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination of setpoint drift is generally made during the performance of a COT when the process instrumentation is set up for adjustment to bring it to within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

BASES

ACTIONS (continued)

A.1

With one train of the BDPS OPERABLE, Required Action A.1 requires that the inoperable train must be restored to OPERABLE status within 72 hours. In this Condition, the remaining the BDPS train is adequate to provide protection. The 72 hour Completion Time is based on the BDPS Function and is consistent with Engineered Safety Feature Actuation System Completion Times for loss of one redundant train. Also, the remaining OPERABLE train provides continuous indication of core power status to the operator, has an alarm function, and sends a signal to both trains of the BDPS to assure system actuation.

B.1, B.2.1, B.2.2.1, and B.2.2.2

With two trains inoperable, or the Required Action and associated Completion Time of Condition A not met, the initial action (Required Action B.1) is to suspend all operations involving positive reactivity additions immediately. This includes withdrawal of control or shutdown rods and intentional boron dilution. A Completion Time of 1 hour is provided to restore one train to OPERABLE status.

1

As an alternate to restoring one train to OPERABLE status (Required Action B.2.1), Required Action B.2.2.1 requires valves listed in LCO 3.9.2 (Required Action A.2) to be secured to prevent the flow of unborated water into the RCS. Once it is recognized that two trains of the BDPS are inoperable, the operators will be aware of the possibility of a boron dilution, and the 1 hour Completion Time is adequate to complete the requirements of LCO 3.9.2.

Required Action B.2.2.2 accompanies Required Action B.2.2.1 to verify the SDM according to SR 3.1.1.1 within 1 hour and once per 12 hours thereafter. This backup action is intended to confirm that no unintended boron dilution has occurred while the BDPS was inoperable, and that the required SDM has been maintained. The specified Completion Time takes into consideration sufficient time for the initial determination of SDM and other information available in the control room related to SDM.

Required Action B.1 is modified by a Note which permits plant temperature changes provided the temperature change is accounted for in the calculated SDM. Introduction of temperature changes, including temperature increases when a positive MTC exists, must be evaluated to ensure they do not result in a loss of required SDM.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

The BDPS trains are subject to a COT and a CHANNEL CALIBRATION.

Performance of the CHANNEL CHECK once every 12 hours 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. A 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 unit 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 senor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels. 1

SR 3.3.9.2

SR 3.3.9.2 requires the performance of a COT every [92] days, to ensure that each train of the BDPS and associated trip setpoint are fully operational. 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 COT 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 shall include verification that the boron dilution alarm setpoint is equal to or less than an increase of twice the count rate within a 10 minute period. The Frequency of [92] days is consistent with the requirements for source range channels in WCAP-15376 (Ref. 2).

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.9.3

SR 3.3.9.3 is the performance of a CHANNEL CALIBRATION every [18] months. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor except the neutron detector of the SRM circuit. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. For the BDPS, the CHANNEL CALIBRATION shall include verification that on a simulated or actual boron dilution flux doubling signal the centrifugal charging pump suction valves from the RWST open, and the normal CVCS volume control tank discharge valves close in the required closure time of ≤ 20 seconds.

The Frequency is based on operating experience and consistency with the typical industry refueling cycle.

REFERENCES

1. FSAR, Chapter [15].

2. WCAP-15376, Revision 0, October 2000.

1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.3.9 BASES, BORON DILUTION PROTECTION SYSTEM (BDPS)

1. ISTS B 3.3.9, "Boron Dilution Protection System (BDPS)," is not included in the Kewaunee Power Station (KPS) ITS. KPS does not have a Boron Dilution Protection System.

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