ENCLOSURE 2

VOLUME 8

SEQUOYAH NUCLEAR PLANT UNIT 1 AND UNIT 2

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.3 INSTRUMENTATION

Revision 0

LIST OF ATTACHMENTS

1. **ITS 3.3.1 – Reactor Trip System (RTS) Instrumentation**
2. **ITS 3.3.2 – Engineered Safety Feature Actuation System (ESFAS) Instrumentation**
3. **ITS 3.3.3 – Post Accident Monitoring (PAM) Instrumentation**
4. **ITS 3.3.4 – Remote Shutdown Monitoring Instrumentation**
5. **ITS 3.3.5 – Loss Of Power (LOP) Diesel Generator (DG) Start Instrumentation**
6. **ITS 3.3.6 - Containment Ventilation Isolation Instrumentation**
7. **ITS 3.3.7 - Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation**
8. **ITS 3.3.8 - Auxiliary Building Gas Treatment System (ABGTS) Actuation Instrumentation**
9. **ITS 3.3.9 - Boron Dilution Monitoring Instrumentation (BDMI)**
10. **Relocated/Deleted Current Technical Specifications**

ATTACHMENT 1

ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

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

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.1 3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

Applicability APPLICABILITY: As shown in Table 3.3-1.

ACTION:

Add proposed ACTIONS Note A02

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR Table Note 4.3.1.1.1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1. M01

~~92 days on a STAGGERED TEST BASIS~~ M02

SR 3.3.1.5 4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE ~~prior to each reactor startup unless performed during the preceeding 92 days~~. The total interlock function shall be demonstrated

SR 3.3.1.10
SR 3.3.1.11 OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.1.14 4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit ~~at least once per 18 months~~. Neutron detectors are exempt from response time testing. ~~Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.~~ A03

~~18 months on a STAGGERED TEST BASIS~~ A04

In accordance with the Surveillance Frequency Control Program LA01

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

ITS ACTIONS

ITS		FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	ITS ACTIONS
1	1.	Manual Reactor Trip	~~2~~	~~1~~	2	1, 2, and *	1	B, C
2.a 2.b	2.	Power Range, Neutron Flux	~~4~~	~~2~~	~~3~~ 4	1, 2	2	D, E
3.a	3.	Power Range, Neutron Flux High Positive Rate	~~4~~	~~2~~	~~3~~ 4	1, 2	2	E
3.b	4.	Power Range, Neutron Flux, High Negative Rate	~~4~~	~~2~~	~~3~~ 4	1, 2	2	E
4	5.	Intermediate Range, Neutron Flux	~~2~~	~~1~~	2	1, 2, ~~and *~~	3, ~~17~~	F, G
5	6.	Source Range, Neutron Flux						
		A. Startup	~~2~~	~~1~~	2	2##, and *	4	H, I, J
		B. Shutdown	2	0	1	3, 4 and 5	5	See ITS 3.3.9
6	7.	Overtemperature ΔT Four Loop Operation	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
7	8.	Overpower ΔT Four Loop Operation	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
8.a	9.	Pressurizer Pressure-Low	~~4~~	~~2~~	~~3~~ 4	1~~, 2~~ (g)	6	K
8.b	10.	Pressurizer Pressure—High	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
9	11.	Pressurizer Water Level—High	~~3~~	~~2~~	~~2~~ 3	1~~, 2~~ (g)	6	K

LA02

A05

A06

A06

L01

A07

A08

L02

A05

LA02

Add proposed footnote (g)

L02

ITS

Table 3.3.1-1

A01

ITS 3.3.1

TABLE 3. 3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

		FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~ LA02	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED A05 CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	ITS ACTIONS
10	12.	Loss of Flow ~~- Single Loop (Above P-8)~~ LA03	~~3/loop~~	~~2/loop in any operating loop~~	3 ~~2~~/loop ~~in each operating loop~~	1 (g)	6	K A05 L02
10	13.	Loss of Flow ~~- Two Loops (Above P-7 and below P-8)~~	~~3/loop~~	~~2/loop in two operating loops~~	3 ~~2~~/loop ~~in each operating loop~~	1	6	K
13	14.	Main Steam Generator Water Level--Low-Low						
13.a	A.	Steam Generator Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen~~	3 ~~2~~/Stm. Gen. ~~in each Operating Stm. Gen.~~	1,2	9	R A05
13.b	B.	Steam Generator Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	3 ~~2~~/Stm. Gen. ~~in each operating Stm. Gen.~~	1,2	9	R
13.a 13.b	C.	RCS Loop ΔT	~~4 (1/loop)~~	~~2~~	1 per loop ~~3~~	1,2	10	T A05
13.a	D.	Containment Pressure (EAM)	~~4~~	~~2~~	4 ~~3~~	1,2	11	S A05
	15.	Deleted						
11	16.	Undervoltage-Reactor Coolant Pumps	~~4-1/bus~~	~~2~~	1 per bus ~~3~~	1 (g)	6	K A05 L02
12	17.	Underfrequency-Reactor Coolant Pumps	~~4-1/bus~~	~~2~~	1 per bus ~~3~~	1	6	K
14	18.	Turbine Trip						
14.a	A.	Low Fluid Oil Pressure	~~3~~	~~2~~	3 ~~2~~	1**	6	L | A05
14.b	B.	Turbine Stop Valve Closure	~~4~~	~~4~~	4	1**	7	L |

ITS

A01

ITS 3.3.1

Table 3.3.1-1

ITS ACTIONS

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

LA02

A05

A09

ITS		FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	ITS ACTIONS
15	19.	Safety Injection Input from ESF	~~2~~	~~1~~	2	1, 2	12	M
17 18	20.	Reactor Trip Breakers (i)						
		A. Startup and Power Operation	~~2~~	~~1~~	2	1, 2	12 15	N, Q
		B. Shutdown	~~2~~	~~1~~	2	3*,4* and 5*	16	C
19	21.	Automatic Trip Logic						
		A. Startup and Power Operation	~~2~~	~~1~~	2	1, 2	12	M
		B. Shutdown	~~2~~	~~1~~	2	3*,4* and 5*	16	C
16	22.	Reactor Trip System Interlocks						
16.a		A. Intermediate Range Neutron Flux, P-6	~~2~~	~~1~~	2	(f) 2~~, and*~~	8a	O
16.b		B. Power Range Neutron Flux, P-7	~~4~~	~~2~~	~~3~~ 1 per train	1	8b	P
16.c		C. Power Range Neutron Flux, P-8	~~4~~	~~2~~	~~3~~ 4	1	8c	P
16.e		D. Power Range Neutron Flux, P-10	~~4~~	~~2~~	~~3~~ 4	1, 2	8d	O
16.f		E. Turbine Impulse Chamber Pressure, P-13	~~2~~	~~1~~	2	1	8b	P
16.d		F. Power Range Neutron Flux, P-9	~~4~~	~~2~~	~~3~~ 4	1	8e	P
		G. Reactor Trip P-4	2	1	2	1, 2, and *	14	See ITS 3.3.2

A10

L03

A11

M03

Add Function 18, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms

A10

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 3.3-1 (Continued)

A12

TABLE NOTATION

MODES 3, 4, and 5

LA04

Footnote (a) *With ~~the reactor trip system breakers in the closed position,~~ the control rod drive system capable of rod withdrawal~~, and fuel in the reactor vessel~~.

or one or more rods not fully inserted

M04

A13

Footnote (h) ** Above the P-9 (Power Range Neutron Flux) interlock.

Footnote (f) ##Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

Add proposed Table 3.3-1 footnote (i)

A09

ACTION STATEMENTS

ACTION B
ACTION C

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours ~~and/or open the reactor trip breakers~~.

ACTION B

Add proposed Required Actions C.2.1 and C.2.2

L04

ACTION D
ACTION E

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

72

L05

Required Action D.1.1 and D.2.1
Required Action E.1

a. The inoperable channel is placed in the tripped condition within ~~6~~ hours.

Required Action D.1.1 Note
Required Action E.1 Note

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

12

L06

Required Action D.2.2

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

Add proposed Required Action D.1.2

L07

Add proposed Required Action D.2.2 Note

L08

Add proposed Required Actions D.3 and E.2

M05

TABLE 3.3-1 (Continued)

ACTION F

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level: A07

Function 4 Applicability

~~a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

ACTION F

~~b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.~~ L09

Add proposed Required Actions F.1 and F.2 M06

~~c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.~~

Add proposed ACTION G M07

Function 4 Applicability

~~d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.~~ A07

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

ACTIONS H, J

Add proposed Required Action H.1 for MODE 2 below P-6 M08

a. ~~Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~ Add proposed Required Actions J.1, J.2.1, and J.2.2 for MODES 3(a), 4(a), 5(a)

Add proposed ACTION I M09

Function 5 Applicability

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter. See ITS 3.3.9

ACTIONS E, K, and L

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

Required Actions E.1, K.1, and L.1

a. The inoperable channel is placed in the tripped condition within ~~6~~ 72 hours. L05

Add proposed Required Action K.2 M10

Required Actions E.1, K.1, L.1 Note

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to ~~4~~ 12 hours for surveillance testing of other channels per Specification 4.3.1.1.1. L06

Add proposed Required Action L.2 M11

ACTION L

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within ~~6~~ 72 hours or THERMAL POWER is reduced to less than P-9 within ~~10~~ 76 hours. L05 A14

Add proposed Required Action L Note L10

ITS A01 ITS 3.3.1

TABLE 3.3-1 (Continued)

Add proposed Required Actions O.1 and P.1 M12

ACTIONS O, P **ACTION 8 -** With less than the Minimum Number of Channels OPERABLE, ~~declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions. Functions to be evaluated are:~~

Add proposed Required Actions O.2 and P.2 A15

~~a.~~ ~~Source Range Reactor Trip~~

~~b.~~ ~~Reactor Trip~~

~~Low Reactor Coolant Loop Flow (2 loops)~~
Undervoltage
~~Underfrequency~~
~~Pressurizer Low Pressure~~
~~Pressurizer High Level~~

~~c.~~ ~~Reactor Trip~~

~~Low Reactor Coolant Loop Flow (1 loop)~~

~~d.~~ ~~Reactor Trip~~

~~Intermediate Range~~
~~Low Power Range~~
~~Source Range~~

~~e.~~ ~~Reactor Trip~~

~~Turbine Trip~~

ACTION R **ACTION 9 -** With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

Required Action R.2 a. The inoperable channel is placed in the tripped condition within 6 hours.

Required Action R.1 b. For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for multiple affected steam generators (T_M) within 4 hours.

Required Action R Note c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

Add proposed ACTION U M13

ACTION T **ACTION 10 -** With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

Add proposed Required Action T.2 L11

Add proposed Required Action T.3 M14

ITS

A01

ITS 3.3.1

TABLE 3.3-1 (Continued)

ACTION S

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

Add proposed Required Action S.2 — L12

Add proposed Required Action S.3 — M15

ACTION M, N

ACTION 12 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within ~~6~~ 30 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

restore train to OPERABLE status within 24 hours, or — L13

ACTION 13 - Deleted

ACTION 14 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.

See ITS 3.3.2

ACTION Q

ACTION 15 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to operable status within 48 hours or ~~declare the breaker inoperable and apply ACTION 12~~. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status.

Add proposed Required Action Q.2 — A16

ACTION Q Note

ACTION C

ACTION 16 - With the number of OPERABLE channels one less than the minimum channels operable requirement, restore the inoperable channel to OPERABLE status within 48 hours or ~~open the reactor trip breakers within the next hour~~.

Add proposed Required Actions C.2.1 and C.2.2 — L04

Function 4 Applicability

~~ACTION 17 - With the number of OPERABLE channels two less than the minimum channels OPERABLE requirement and with the THERMAL POWER level above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.~~

A07

Ⓐ01

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(A01)

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ITS

Table 3.3.1-1

A01

ITS 3.3.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01

A16

		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1	1.	Manual Reactor Trip	N.A.	A18 N.A.	L14 ~~S/U(1)and~~ ~~R(9)~~ SR 3.3.1.12	1, 2, and *
2.a 2.b	2.	Power Range, Neutron Flux	SR 3.3.1.1 ~~S~~	SR 3.3.1.2 SR 3.3.1.3 ~~D~~(2), (3) and ~~Q~~(6) SR 3.3.1.11 ~~18 months~~	~~Q~~ SR 3.3.1.7 SR 3.3.1.8, INSERT 2	1, 2
3.a	3.	Power Range, Neutron Flux, High Positive Rate	N.A.	~~R~~(6) SR 3.3.1.11	~~Q~~ SR 3.3.1.7	LA05 1, 2
3.b	4.	Power Range, Neutron Flux, High Negative Rate	N.A.	~~R~~(6) SR 3.3.1.11 M17 ~~184 days thereafter~~	M16 ~~Q~~ SR 3.3.1.7 INSERT 2	1, 2
4	5.	Intermediate Range, Neutron Flux	SR 3.3.1.1 ~~S~~	~~R~~(6) SR 3.3.1.11	S/U(1) SR 3.3.1.8 INSERT 1	1, 2, and *
5	6.	Source Range, Neutron Flux	SR 3.3.1.1 ~~S~~(7)	~~R~~(6) SR 3.3.1.11	~~M~~ and S/U(1) SR 3.3.1.7 SR 3.3.1.8	2, 3, 4, 5, and *
6	7.	Overtemperature Delta T	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
		M18 Add proposed SR 3.3.1.6 and Note at a Frequency of ~~92 EFPD~~				
7	8.	Overpower Delta T	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.a	9.	Pressurizer Pressure--Low	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.b	10.	Pressurizer Pressure--High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
9	11.	Pressurizer Water Level—High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
10	12.	Loss of Flow - Single Loop	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1
10	13.	Loss of Flow - Two Loops	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	N.A.	1
13	14.	Steam Generator Water Level--Low-Low				
13.a		A. Steam Generator Water Level--Low-Low (Adverse)	SR 3.3.1.1 ~~S~~	SR 3.3.1.10 ~~R~~	~~Q~~ SR 3.3.1.7	1, 2
13.b		B. Steam Generator Water Level--Low-Low (EAM)	SR 3.3.1.1 ~~S~~	SR 3.3.1.10 ~~R~~	~~Q~~ SR 3.3.1.7	1, 2
13.a 13.b		C. RCS Loop ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a		D. Containment Pressure (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2

~~184 days~~ L15

In accordance with the Surveillance Frequency Control Program LA01

Ⓜ16

INSERT 1

Four hours after reducing power below P-6 for source range instrumentation

Ⓜ16

INSERT 2

Twelve hours after reducing power below P-10 for power and intermediate range instrumentation

ITS (A01) ITS 3.3.1

Table 3.3.1-1

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

(M01) (A17)

ITS		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE IS REQUIRED
	15.	Deleted				
11	16.	Undervoltage - Reactor Coolant Pumps	N.A.	~~R~~ SR 3.3.1.10	SR 3.3.1.9 ~~Q~~	1
12	17.	Underfrequency - Reactor Coolant Pumps	N.A.	SR 3.3.1.10 ~~R~~	SR 3.3.1.9 ~~Q~~	1
14	18.	Turbine Trip				
14.a		A. Low Fluid Oil Pressure	N.A.	SR 3.3.1.10 ~~N.A~~.	(1) (12) SR 3.3.1.13	1**
14.b		B. Turbine Stop Valve Closure	N.A.	~~N.A.~~ SR 3.3.1.10	(1) (12) SR 3.3.1.13	1**
15	19.	Safety Injection Input from ESF	N.A.	N.A.	~~R~~ SR 3.3.1.12	1, 2
17	20.	Reactor Trip Breaker	N.A.	N.A.	~~M(5) and S/U(1)~~ SR 3.3.1.4	1, 2, and *
19	21.	Automatic Trip Logic	N.A.	N.A.	SR 3.3.1.5 ~~M(5)~~	1, 2, and *
16	22.	Reactor Trip System Interlocks				
16.a		A. Intermediate Range Neutron Flux, P-6	N.A.	~~R~~ SR 3.3.1.11	N.A.	2, and *
16.b		B. Power Range Neutron Flux, P-7	N.A.	N.A.	~~N.A.~~ SR 3.3.1.5	1
16.c		C. Power Range Neutron Flux, P-8	N.A.	~~R~~ SR 3.3.1.11	N.A.	1
16.e		D. Power Range Neutron Flux, P-10	N.A.	~~R~~ SR 3.3.1.11	N.A.	1, 2
16.f		E. Turbine Impulse Chamber Pressure, P-13	N.A.	~~R~~ SR 3.3.1.10	N.A.	1
16.d		F. Power Range Neutron Flux, P-9	N.A.	~~R~~ SR 3.3.1.11	N.A.	1
		G. Reactor Trip, P-4	N.A.	N.A.	R	1, 2, and *
17 Footnote (i)	23.	Reactor Trip Bypass Breaker	N.A.	N.A.	SR 3.3.1.4 ~~M(10)~~ SR 3.3.1.12 ~~R(11)~~	1, 2, and *

(L16) ~~62 days on a STAGGERED TEST BASIS~~

(M19) ~~18 months~~

(L17) ~~92 days on a STAGGERED TEST BASIS~~

(M02) Add proposed SR 3.3.1.5

(LA01) In accordance with the Surveillance Frequency Control Program

See ITS 3.3.2

(A17)

(L16) ~~62 days on a STAGGERED TEST BASIS~~

(A09)

(LA01) In accordance with the Surveillance Frequency Control Program

Table 3.3.1-1

TABLE 4.3-1 (Continued)

NOTATION

LA04

Footnote (a) * - With the ~~reactor trip system breakers closed and the~~ control rod drive system capable of rod withdrawal.

or one or more rods not fully inserted M04

Footnote (h) ** - Above the P-9 (Power Range Neutron Flux) interlock.

184 days for ITS Functions 4 and 5. Otherwise 31 days L18

SR 3.3.1.8 and SR 3.3.1.13 Frequency Note (1) - If not performed in previous ~~31~~ days.

12 hours after M20

SR 3.3.1.2 (2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

SR 3.3.1.3 (3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is ≥ 15% RTP.

~~92 days on a STAGGERED TEST BASIS for Automatic Trip Logic~~ L17

(4) - Deleted.

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.1.4 SR 3.3.1.5 (5) - Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~. ~~The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.~~

SR 3.3.1.4

LA05

SR.3.3.1.11 Note (6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

L19

Footnote (f) (7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

SR 3.3.1.12 ~~(9)~~ - ~~The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.~~

LA05

SR 3.3.1.4 (10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.1.12 ~~(11)~~ - ~~Automatic and manual undervoltage trip.~~

LA05

SR 3.3.1.13 (12) - Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.

Add proposed SR 3.3.1.7 Note L20

Add proposed SR 3.3.1.10 Note A19

Add proposed SR 3.3.1.9, SR 3.3.1.12, and SR 3.3.1.13 Note A20

Add proposed SR 3.3.1.8 Note M21

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

LCO 3.3.1

2.2.1 The reactor trip system instrumentation and interlocks setpoints shall be set consistent with the Nominal Trip Setpoint values shown in Table 2.2-1.

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

ACTION:

Add proposed Table 3.3.1-1 Footnote (b)

M22

ACTION A

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

Add proposed Table 3.3.1-1 Footnote (c)

M23

Table 3.3.1-1

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

		FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1	1.	Manual Reactor Trip	Not Applicable	Not Applicable
2.a 2.b	2.	Power Range Neutron Flux	Low Setpoint - 25% of RATED THERMAL POWER High Setpoint - 109% of RATED THERMAL POWER	Low Setpoint - ≤ 27.4% of RATED THERMAL POWER High Setpoint - ≤ 111.4% of RATED THERMAL POWER
3.a	3.	Power Range Neutron Flux High Positive Rate	5% of RATED THERMAL POWER with a time constant ≥ 2 second	≤ 6.3% of RATED THERMAL POWER with a time constant ≥ 2 second
3.b	4.	Power Range Neutron Flux, High Negative Rate	5% of RATED THERMAL POWER with a time constant ≥ 2 second	≤ 6.3% of RATED THERMAL POWER with a time constant ≥ 2 second
4	5.	Intermediate Range, Neutron Flux	25% of RATED THERMAL POWER	≤ 45.20% of RATED THERMAL POWER
5	6.	Source Range Neutron Flux	10^5 counts per second	≤ 1.45 x 10^5 counts per second
6	7.	Overtemperature ΔT	See Note 1	See Note 3
7	8.	Overpower ΔT	See Note 2	See Note 4
8.a	9.	Pressurizer Pressure--Low	1970 psig	≥ 1964.8 psig
8.b	10.	Pressurizer Pressure--High	2385 psig	≤ 2390.2 psig
9	11.	Pressurizer Water Level—High	92% of instrument span	≤ 92.7% of instrument span
10.	12.	Loss of Flow	90% ~~of design flow per loop*~~	≥ 89.6% ~~of design flow per loop*~~

LA06

~~* Design flow is 94,600 (91,400 X 1.035) gpm per loop.~~

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
13 13. Steam Generator Water Level--Low-Low		
a. RCS Loops ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5)	≤ (1.01) T_S (Note 5)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5)	≤ (1.01) T_M (Note 5)
b. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES	
	14. Deleted			
11	15. Undervoltage-Reactor Coolant Pumps	5022 volts-each bus	≥ 4739 volts-each bus	
12	16. Underfrequency-Reactor Coolant Pumps	~~56.0~~ 57.0 Hz - each bus	≥ ~~55.9~~ 56.3 Hz - each bus	M24
14	17. Turbine Trip			
	A. Low Trip System Pressure	45 psig	≥ 39.5 psig	
	B. Turbine Stop Valve Closure	1% open	≥ 1% open	
15	18. Safety Injection Input from ESF	Not Applicable	Not Applicable	
16.a	19. Intermediate Range Neutron Flux - (P-6) ~~Enable Block Source Range Reactor Trip~~	1 x 10^{-4}% of RATED THERMAL POWER	≥ 6 x 10^{-5}% of RATED THERMAL POWER	LA07
16.e	20. Power Range Neutron Flux (~~not~~ P-10) ~~Input to Low Power Reactor Trips Block P-7~~	10% of RATED THERMAL POWER	≤ 12.4% of RATED THERMAL POWER	A21

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
16.f	21. Turbine Impulse Chamber Pressure - (P-13) ~~Input to Low Power Reactor Trips Block P-7~~	10% Turbine Impulse Pressure Equivalent	≤ 12.4% Turbine Impulse Pressure Equivalent
16.c	22. Power Range Neutron Flux - (P-8) ~~Low Reactor Coolant Loop Flow, and Reactor Trip~~	35% of RATED THERMAL POWER	≤ 37.4% of RATED THERMAL POWER
16.e	23. Power Range Neutron Flux - (P-10) ~~- Enable Block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips~~	10% of RATED THERMAL POWER	≥ 7.6% of RATED THERMAL POWER
	24. Reactor Trip P-4	Not Applicable	Not Applicable
16.d	25. Power Range Neutron Flux - (P-9) ~~- Blocks Reactor Trip for Turbine Trip Below 50% Rated Power~~	50% of RATED THERMAL POWER	≤ 52.4% of RATED THERMAL POWER

LA07

See ITS 3.3.2

LA07

NOTATION

Note 1

NOTE 1:

$$\text{Overtemperature } \Delta T \left(\frac{1 + \tau_4 S}{1 + \tau_5 S}\right) \leq \Delta T_0 \left\{K_1 - K_2 \left(\frac{1 + \tau_1 S}{1 + \tau_2 S}\right) [T - T'] + K_3 (P - P') - f_1 (\Delta I)\right\}$$

Where:

~~$\frac{1+\tau_4 S}{1+\tau_5 S}$~~ = ~~Lead-lag compensator on measured ΔT~~

~~τ4, τ5~~ = ~~Time constants utilized in the lead-lag controller for ΔT,~~ τ4 ≥ ~~5~~ secs, τ5 ≤ ~~3~~ sec.

LA08

ΔT_0 = Indicated ΔT at RATED THERMAL POWER

K_1 ≤ ~~1.15~~

K_2 ≥ ~~0.011~~

*

LA09

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

Note 1

NOTE 1: (Continued)

$\frac{1 + \tau_1 S}{1 + \tau_2 S}$ ~~=~~ ~~The function generated by the lead-lag controller for T_{avg} dynamic compensation~~

LA08

LA09

*

~~τ_1, & τ_2~~ ~~=~~ ~~Time constants utilized in the lead-lag controller for T_{avg},~~ $\tau_1 \geq$ ~~33~~ secs., $\tau_2 \leq$ ~~4~~ secs.

T = Average temperature °F

T' ≤ ~~578.2~~°F (T_{avg} at RATED THERMAL POWER)

*

LA09

K_3 = ~~0.00055~~

P = Pressurizer pressure, psig

*

LA09

P' = ~~2235~~ psig (Nominal RCS operating pressure)

S = Laplace transform operator (sec^{-1})

and f_1 (ΔI) is a function ~~of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests~~ such that:

LA08

(i) for q_t - q_b between QTNL* and QTPL* f_1 (ΔI) = 0 (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

Note 1 NOTE 1: (Continued)

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QTPL*, the ΔT nominal trip setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

Note 2 NOTE 2: Overpower

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \le \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 \; (T - T'') - f_2 \; (\Delta I)\right\}$$

Where:

~~$\frac{1+\tau_4 S}{1+\tau_5 S}$ = as defined in Note 1~~ LA08

τ_4, τ_5 = as defined in Note 1

ΔT_0 = as defined in Note 1

$K_4 \le$ ~~1.087~~ * LA09

$K_5 \ge$ ~~0.02~~/°F for increasing average temperature and ~~0~~ for decreasing average temperature

~~$\frac{\tau_3 S}{1 + \tau_3 S}$ = The function generated by the rate-lag controller for T_{avg} dynamic compensation~~ LA08

These values denoted with * (including) LA09

*QTNL, QTPL, QTNS, and QTPS are specified in the COLR per Specification 6.9.1.14.

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

LA08

Note 2 NOTE 2: (Continued)

τ_3 = ~~Time constant utilized in the rate-lag controller for T_{avg},~~ $\tau_3 \geq$ ~~10~~ secs.

*

LA09

K_6 ≥ ~~0.0011~~ for $T > T''$ and $K_6 \geq$ ~~0~~ for $T \leq T''$

T = as defined in Note 1

T'' = Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ ~~578.2~~ °F)

*

LA09

S = as defined in Note 1

and $f_2(\Delta I)$ is a function ~~of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests~~ such that:

LA08

(i) for $q_t - q_b$ between QPNL* and QPPL* $f_2(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPNL* the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPPL* the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

Note 1 NOTE 3: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.9 percent ΔT span.

Note 2 NOTE 4: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.7 percent ΔT span.

These values denoted with * (including

)

LA09

*QPNL, QPPL, QPNS, and QPPS are specified in the COLR per Specification 6.9.1.14.

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

Note 3

NOTE 5: Trip Time Delay - Steam Generator Water Level -- Low-Low

T_s = {(-0.00583) $(P)^3$ + (0.735) $(P)^2$ - (33.560) (P) + 649.5} 0.99 secs.

T_m = {(-0.00532) $(P)^3$ + (0.678) $(P)^2$ - (31.340) (P) + 589.5} 0.99 secs.

Where:

P = RCS Loop ΔT Equivalent to Power (% RTP), $P \leq 50\%$ RTP

T_s = Time delay for Steam Generator Water level -- Low-Low Reactor Trip, one Steam Generator affected. (Secs.)

T_m = Time delay for Steam Generator Water Level -- Low-Low Reactor Trip, two or more Steam Generators affected. (Secs.)

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.1 3.3.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

Applicability APPLICABILITY: As shown in Table 3.3-1.

ACTION:

Add proposed ACTIONS Note A02

ACTION A As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

SR Table Note 4.3.1.1.1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1. M01

~~92 days on a STAGGERED TEST BASIS~~ M02

SR 3.3.1.5 4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE ~~prior to each reactor startup unless performed during the preceeding 92 days~~. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

SR 3.3.1.10
SR 3.3.1.11

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.1.14 4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit ~~at least once per 18 months~~. Neutron detectors are exempt from response time testing. ~~Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.~~ A03

~~18 months on a staggered test basis~~ A04

In accordance with the Surveillance Frequency Control Program LA01

ITS

Table 3.3.1-1

ITS 3.3.1

ITS ACTIONS

A01

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

LA02 A05 A06

ITS		FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS ~~OPERABLE~~ REQUIRED	APPLICABLE MODES	ACTION	ITS ACTIONS
1	1.	Manual Reactor Trip	~~2~~	~~1~~	2	1, 2, and *	1	B, C
2.a 2.b	2.	Power Range, Neutron Flux	~~4~~	~~2~~	~~3~~ 4	1, 2	2	D, E
3.a	3.	Power Range, Neutron Flux High Positive Rate	~~4~~	~~2~~	~~3~~ 4	1, 2	2	E
3.b	4.	Power Range, Neutron Flux, High Negative Rate	~~4~~	~~2~~	~~3~~ 4	1, 2	2	E
4	5.	Intermediate Range, Neutron Flux	~~2~~	~~1~~	2	1, 2, ~~and *~~	3, ~~17~~	F, G
5	6.	Source Range, Neutron Flux						
		A. Startup	~~2~~	~~1~~	2	2##, and *	4	H, I, J
		B. Shutdown	2	0	1	3, 4 and 5	5	See ITS 3.3.9
6	7.	Overtemperature ΔT Four Loop Operation	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
7	8.	Overpower ΔT Four Loop Operation	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
8.a	9.	Pressurizer Pressure-Low	~~4~~	~~2~~	~~3~~ 4	1(g)~~, 2~~	6	K
8.b	10.	Pressurizer Pressure—High	~~4~~	~~2~~	~~3~~ 4	1, 2	6	E
9	11.	Pressurizer Water Level—High	~~3~~	~~2~~	~~2~~ 3	1(g)~~, 2~~	6	K

A06 L01 A07 A08 L02 A05 LA02

Add proposed footnote (g) L02

ITS

A01

ITS 3.3.1

ITS ACTIONS

TABLE 3. 3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

LA02

A05

ITS		FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	ITS ACTIONS
10 Footnote (g)	12.	Loss of Flow ~~- Single Loop (Above P-8)~~ LA03	~~3/loop~~	~~2/loop in any operating loop~~	~~2~~ 3/loop ~~in each operating loop~~	1 (g)	6	K A05 L02
10 Footnote (g)	13.	Loss of Flow ~~- Two Loops (Above P-7 and below P-8)~~	~~3/loop~~	~~2/loop in two operating loops~~	~~2~~ 3/loop ~~in each operating loop~~	1 (g)	6	K
13	14.	Main Steam Generator Water Level--Low-Low	~~-~~					
13.a		A. Steam Generator Water Level--Low-Low (Adverse)	~~3/Stm. Gen~~	~~2/Stm. Gen. in any operating Stm. Gen~~	~~2~~ 3/Stm. Gen. ~~in each Operating Stm. Gen.~~	1,2	9	R A05
13.b		B. Steam Generator Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen~~	~~2~~ 3/Stm. Gen. ~~in each operating Stm. Gen~~.	1,2	9	R
13.a 13.b		C. RCS Loop ΔT	~~4 (1/loop)~~	~~2~~	~~3~~ 1 per loop	1,2	10	T A05
13.a		D. Containment Pressure (EAM)	~~4~~	~~2~~	~~3~~ 4	1,2	11	S A05
	15.	Deleted						

A01

Table 3.3.1-1

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

LA02

A05 REQUIRED

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	ITS ACTIONS
11	16. Undervoltage-Reactor Coolant Pumps	~~4-1/bus~~	~~2~~	~~3~~ 1 per bus (A05)	1 (g) (L02)	6	K
12	17. Underfrequency-Reactor Coolant Pumps	~~4-1/bus~~	~~2~~	~~3~~ 1 per bus	1 (g)	6	K
14	18. Turbine Trip						
14.a	A. Low Fluid Oil Pressure	~~3~~	~~2~~	~~2~~ 3 (A05)	1**	6	L
14.b	B. Turbine Stop Valve Closure	~~4~~	~~4~~	4	1**	7	L
15	19. Safety Injection Input from ESF	~~2~~	~~1~~	2	1, 2	12	M
17 18	20. Reactor Trip Breakers (i) (A09)						
	A. Startup and Power Operation	~~2~~	~~1~~	2	1, 2	12, 15 (A10)	N, Q
	. Shutdown	~~2~~	~~1~~	2	3*,4* and 5*	16	C
19	21. Automatic Trip Logic						
	A. Startup and Power Operation	~~2~~	~~1~~	2	1, 2	12	M
	B. Shutdown	~~2~~	~~1~~	2	3*,4* and 5*	16	C
16	22. Reactor Trip System Interlocks						
16.a	A. Intermediate Range Neutron Flux, P-6	~~2~~	~~1~~	2	2~~, and*~~ (f) (L03)	8a	O
16.b	B. Power Range Neutron Flux, P-7	~~4~~	~~2~~	~~3~~ 1 per train (A11)	1	8b	P

Add Function 18, Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms A10

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 3.3-1 (Continued)

ITS ACTIONS

LA02

REACTOR TRIP SYSTEM INSTRUMENTATION

REQUIRED

A05

M03

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS ~~OPERABLE~~	APPLICABLE MODES	ACTION	
16.c	C. Power Range Neutron Flux, P-8	~~4~~	~~2~~	~~3~~ 4	1	8c	P
16.e	D. Power Range Neutron Flux, P-10	~~4~~	~~2~~	~~3~~ 4	1, 2	8d	O
16.f	E. Turbine Impulse Chamber Pressure, P-13	~~2~~	~~1~~	2	1	8b	P
16.d	F. Power Range Neutron Flux, P-9	~~4~~	~~2~~	~~3~~ 4	1	8e	P
	G. Reactor Trip P-4	2	1	2	1, 2, and *	14	See ITS 3.3.2

ITS A01 ITS 3.3.1

TABLE 3.3-1 (Continued)

A12

TABLE NOTATION

MODES 3, 4, and 5

LA04

Footnote (a) * With ~~the reactor trip system breakers in the closed position,~~ the control rod drive system capable of rod withdrawal~~, and fuel in the reactor vessel~~.

or one or more rods not fully inserted M04

A13

Footnote (h) ** Above the P-9 (Power Range Neutron Flux) interlock.

Footnote (f) ## Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

Add proposed Table 3.3-1 footnote (i) A09

ACTION STATEMENTS

ACTION B
ACTION C

ACTION 1 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours ~~and/or open the reactor trip breakers~~.

ACTION B

Add proposed Required Actions C.2.1 and C.2.2 L04

ACTION D
ACTION E

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

72 L05

Required Action D.1.1 and D.2.1
Required Action E.1

a. The inoperable channel is placed in the tripped condition within ~~6~~ hours.

12 L06

Required Action D.1.1 Note
Required Action E.1 Note

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to ~~4~~ hours for surveillance testing of other channels per Specification 4.3.1.1.1.

Required Action D.2.2

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

Add proposed Required Action D.1.2 L07

Add proposed Required Action D.2.2 Note L08

Add proposed Required Actions D.3 and E.2 M05

ITS

A01

ITS 3.3.1

TABLE 3.3-1 (Continued)

ACTION F

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

A07

Function 4 Applicability

~~a.~~ ~~Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

ACTION F

~~b.~~ ~~Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.~~

L09

Add proposed Required Actions F.1 and F.2

M06

~~c.~~ ~~Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.~~

Add proposed ACTION G

M07

Function 4 Applicability

~~d.~~ ~~Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.~~

A07

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

ACTIONS H, J

Add proposed Required Action H.1 for MODE 2 below P-6

M08

a. ~~Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.~~

Add proposed Required Actions J.1, J.2.1, and J.2.2 for MODES 3[(a)], 4[(a)], 5[(a)]

Add proposed ACTION I

M09

Function 5 Applicability

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

ACTION 5 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

See ITS 3.3.9

ACTIONS E, K, and L

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

L05

Required Actions E.1, K.1, and L.1

a. The inoperable channel is placed in the tripped condition within ~~6~~ 72 hours.

Add proposed Required Action K.2

M10

Required Actions E.1, K.1, L.1 Note

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to ~~4~~ 12 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

L06

Add proposed Required Action L.2

M11

ACTION L

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within ~~6~~ 72 hours or THERMAL POWER is reduced to less than P-9 within ~~10~~ 76 hours.

.

L05

A14

Add proposed Required Action L Note

L10

A01

TABLE 3.3-1 (Continued)

Add proposed Required Actions O.1 and P.1

M12

ACTIONS O, P

ACTION 8 - With less than the Minimum Number of Channels OPERABLE, ~~declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions. Functions to be evaluated are:~~

Add proposed Required Actions O.2 and P.2

A15

~~a. Source Range Reactor Trip.~~

~~b. Reactor Trip~~

~~Low Reactor Coolant Loop Flow (2 loops)~~
~~Undervoltage~~
~~Underfrequency~~
~~Pressurizer Low Pressure~~
~~Pressurizer High Level~~

~~c. Reactor Trip~~

~~Low Reactor Coolant Loop Flow (1 loop)~~

~~d. Reactor Trip~~

~~Intermediate Range~~
~~Low Power Range~~
~~Source Range~~

~~e. Reactor Trip~~

~~Turbine Trip~~

ACTION R

ACTION 9 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

Required Action R.2

a. The inoperable channel is placed in the tripped condition within 6 hours.

Required Action R.1

b. For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for Multiple affected steam generators (T_M) within 4 hours.

Required Action R Note

c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

Add proposed ACTION U

M13

A01

TABLE 3.3-1 (Continued)

ACTION T

ACTION 10 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

Add proposed Required Action T.2 — L11

Add proposed Required Action T.3 — M14

ACTION S

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

Add proposed Required Action S.2 — L12

Add proposed Required Action S.3 — M15

ACTION M, N

ACTION 12 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, restore train to OPERABLE status within 24 hours, or be in at least HOT STANDBY within ~~6~~ 30 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

L13

ACTION 13 - Deleted

ACTION 14 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.

See ITS 3.3.2

ACTION Q

ACTION 15 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to operable status within 48 hours or Add proposed Required Action Q.2 ~~declare the breaker inoperable and apply ACTION 12~~. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status.

A16

ACTION Q Note

ACTION C

ACTION 16 - With the number of OPERABLE channels one less than the minimum channels operable requirement, restore the inoperable channel to operable status within 48 hours or ~~open the reactor trip breakers within the next hour.~~

Add proposed Required Actions C.2.1 and C.2.2 — L04

Function 4 Applicability

~~ACTION 17 - With the number of OPERABLE channels two less than the minimum channels OPERABLE requirement and with the THERMAL POWER level above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.~~

A07

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A01

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ITS

Table 3.3.1-1

A01

ITS 3.3.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01

LA05

A16

ITS		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1	1.	Manual Reactor Trip	N.A.	A18 N.A.	L14 ~~S/U(1)and R(9)~~ SR 3.3.1.12	1, 2, and *
2.a 2.b	2.	Power Range, Neutron Flux	SR 3.3.1.1 ~~S~~	SR 3.3.1.2 SR 3.3.1.3 ~~D~~(2), (3) and ~~Q~~(6) SR 3.3.1.11 ~~18 months~~	~~Q~~ SR 3.3.1.7 SR 3.3.1.8 INSERT 2	1, 2
3.a	3.	Power Range, Neutron Flux, High Positive Rate	N.A	~~R~~(6) SR 3.3.1.11	SR 3.3.1.7 ~~Q~~	1, 2
3.b	4.	Power Range, Neutron Flux, High Negative Rate	N.A	SR 3.3.1.11 ~~R~~(6) M17 ~~184 days thereafter~~	SR 3.3.1.7 ~~Q~~ M16 INSERT 2	1, 2
4	5.	Intermediate Range, Neutron Flux	SR 3.3.1.1 ~~S~~	~~R~~(6) SR 3.3.1.11	S/U(1) SR 3.3.1.8 INSERT 1	1, 2, and *
5	6.	Source Range, Neutron Flux	SR 3.3.1.1 ~~S~~(7)	~~R~~(6) SR 3.3.1.11	~~M~~ and S/U(1) SR 3.3.1.7 SR 3.3.1.8	2, 3, 4, 5, and *
6	7.	Overtemperature ΔT	M18 SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	SR 3.3.1.7 ~~Q~~	1, 2
7	8.	Overpower ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.a	9.	Pressurizer Pressure--Low	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.b	10.	Pressurizer Pressure--High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
9	11.	Pressurizer Water Level—High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
10	12.	Loss of Flow - Single Loop	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1
10	13.	Loss of Flow - Two Loops	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	N.A.	1
13	14.	Steam Generator Water Level--Low-Low				
13.a		A. Steam Generator Water Level--Low-Low (Adverse)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.b		B. Steam Generator Water Level--Low-Low (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a 13.b		C. RCS Loop ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a		D. Containment Pressure (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2

Add proposed SR 3.3.1.6 and Note at a Frequency of ~~92 EFPD~~

~~184 days~~ L15

In accordance with the Surveillance Frequency Control Program LA01

M16

INSERT 1

Four hours after reducing power below P-6 for source range instrumentation

M16

INSERT 2

Twelve hours after reducing power below P-10 for power and intermediate range instrumentation

A01

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01 A17

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
	15. Deleted				
11	16. Undervoltage - Reactor Coolant Pumps	N.A.	SR 3.3.1.10 ~~R~~	SR 3.3.1.9 ~~Q~~	1
12	17. Underfrequency - Reactor Coolant Pumps	N.A.	SR 3.3.1.10 ~~R~~	SR 3.3.1.9 ~~Q~~ L16 ~~62 days on a STAGGERED TEST BASIS~~	1
14	18. Turbine Trip				
14.a	A. Low Fluid Oil Pressure	N.A.	SR 3.3.1.10 ~~N.A.~~ M19 ~~18 months~~	(1) (12) SR 3.3.1.13	1**
14.b	B. Turbine Stop Valve Closure	N.A.	~~N.A.~~ SR 3.3.1.10	(1) (12) SR 3.3.1.13	1**
15	19. Safety Injection Input from ESF	N.A.	N.A.	~~R~~ SR 3.3.1.12	1, 2
17	20. Reactor Trip Breaker	N.A.	N.A.	SR 3.3.1.4 ~~M(5) and S/U(1)~~	1, 2, and *
19	21. Automatic Trip Logic	N.A.	N.A.	SR 3.3.1.5 ~~M(5)~~ L17 ~~92 days on a STAGGERED TEST BASIS~~	1, 2, and *
16	22. Reactor Trip System Interlocks				
16.a	A. Intermediate Range Neutron Flux, P-6	N.A.	SR 3.3.1.11 ~~R~~	N.A.	2, and *
16.b	B. Power Range Neutron Flux, P-7	N.A.	N.A.	~~N.A.~~ SR 3.3.1.5 M02 Add proposed SR 3.3.1.5	1
16.c	C. Power Range Neutron Flux, P-8	N.A.	SR 3.3.1.11 ~~R~~	N.A.	1
16.e	D. Power Range Neutron Flux, P-10	N.A.	SR 3.3.1.11 ~~R~~	N.A.	1, 2
16.f	E. Turbine Impulse Chamber Pressure, P-13	N.A.	SR 3.3.1.11 ~~R~~	N.A.	1
16.d	F. Power Range Neutron Flux, P-9	N.A.	SR 3.3.1.11 ~~R~~	N.A.	1
	G. Reactor Trip, P-4	N.A.	N.A.	R	1, 2, and *
17 Footnote (k)	23. Reactor Trip Bypass Breaker	N.A.	N.A.	SR 3.3.1.4 SR 3.3.1.12 ~~M(10)R(11)~~ L16 ~~62 days on a STAGGERED TEST BASIS~~	1, 2, and *

In accordance with the Surveillance Frequency Control Program LA01

See ITS 3.3.2

A09 A17

In accordance with the Surveillance Frequency Control Program LA01

Table 4.3-1 (Continued)

NOTATION

Footnote (a)	*	-	With the ~~reactor trip system breakers closed and the~~ control rod drive system capable of rod withdrawal.	LA04 or one or more rods not fully inserted M04
Footnote (h)	**	-	Above the P-9 (Power Range Neutron Flux) interlock.	
SR 3.3.1.8 and SR 3.3.1.13 Frequency Note	(1)	-	If not performed in previous ~~31~~ days.	184 days for ITS Functions 4 and 5. Otherwise 31 days L18
SR 3.3.1.2	(2)	-	Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.	12 hours after M20
SR 3.3.1.3	(3)	-	Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is > 15% RTP.	
	(4)	-	Deleted.	~~92 days on a STAGGERED TEST BASIS for Automatic Trip Logic~~ L17 In accordance with the Surveillance Frequency Control Program LA01
SR 3.3.1.4 SR 3.3.1.5 SR 3.3.1.4	(5)	-	Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~. ~~The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.~~	LA05 L19
SR.3.3.1.11 Note	(6)	-	Neutron detectors may be excluded from CHANNEL CALIBRATION.	
Footnote (f)	(7)	-	Below P-6 (Block of Source Range Reactor Trip) setpoint.	
	(8)	-	Deleted.	
SR 3.3.1.12	~~(9)~~	-	~~The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.~~	LA05
SR 3.3.1.4	(10)	-	Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.	In accordance with the Surveillance Frequency Control Program LA01
SR 3.3.1.12	~~(11)~~	-	~~Automatic and manual undervoltage trip.~~	LA05
SR 3.3.1.13	(12)	-	Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.	

Add proposed SR 3.3.1.7 Note L20

Add proposed SR 3.3.1.10 Note A19

Add proposed SR 3.3.1.9, SR 3.3.1.12, and SR 3.3.1.13 Note A20

Add proposed SR 3.3.1.8 Note M21

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

LCO 3.3.1

2.2.1 The reactor trip system instrumentation and interlocks setpoints shall be set consistent with the Nominal Trip Setpoint values shown in Table 2.2-1.

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

ACTION:

Add proposed Table 3.3.1-1 Footnote (b)

M22

ACTION A

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

Add proposed Table 3.3.1-1 Footnote (c)

M23

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1	1. Manual Reactor Trip	Not Applicable	Not Applicable
2.a 2.b	2. Power Range, Neutron Flux	Low Setpoint - 25% of RATED THERMAL POWER High Setpoint - 109% of RATED THERMAL POWER	Low Setpoint - ≤ 27.4% of RATED THERMAL POWER High Setpoint - ≤ 111.4% of RATED THERMAL POWER
3.a	3. Power Range, Neutron Flux, High Positive Rate	5% of RATED THERMAL POWER with a time constant ≥2 seconds	≤ 6.3% of RATED THERMAL POWER with a time constant ≥2 seconds
3.b	4. Power Range, Neutron Flux, High Negative Rate	5% of RATED THERMAL POWER with a time constant ≥2 seconds	≤ 6.3% of RATED THERMAL POWER with a time constant ≥2 seconds
4	5. Intermediate Range, Neutron Flux	25% of RATED THERMAL POWER	≤ 45.20% of RATED THERMAL POWER
5	6. Source Range, Neutron Flux	10^5 counts per second	≤ 1.45 x 10^5 counts per second
6	7. Overtemperature ΔT	See Note 1	See Note 3
7	8. Overpower ΔT	See Note 2	See Note 4
8.a	9. Pressurizer Pressure--Low	1970 psig	≥ 1964.8 psig
8.b	10. Pressurizer Pressure--High	2385 psig	≤ 2390.2 psig
9	11. Pressurizer Water Level--High	92% of instrument span	≤ 92.7% of instrument span
10	12. Loss of Flow	90% ~~of design flow per loop*~~	≥ 89.6% ~~of design flow per loop*~~

LA06

~~*Design flow is 94,600 (91,400 x 1.035) gpm per loop.~~

ITS A01 ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
13 13. Steam Generator Water Level--Low-Low		
a. RCS Loops ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5)	≤ (1.01) T_S (Note 5)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5)	≤ (1.01) T_M (Note 5)

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	b. RCS Loop ΔT Equivalent to Power > 50% RTP		
	Coincident with		
	Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
	and		
	Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
	or		
	Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument
	14. Deleted		
11	15. Undervoltage-Reactor Coolant Pumps	5022 volts-each bus	≥ 4739 volts - each bus
12	16. Underfrequency-Reactor Coolant Pumps	~~56.0~~ 57.0 Hz - each bus	≥ ~~55.9~~ 56.3 Hz - each bus M24
14	17. Turbine Trip		
14.a	A. Low Trip System Pressure	45 psig	≥ 39.5 psig
14.b	B. Turbine Stop Valve Closure	1% open	> 1% open
15	18. Safety Injection Input from ESF	Not Applicable	Not Applicable

ITS A01 ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES	
16.a	19. Intermediate Range Neutron Flux, P-6, ~~Enable Block Source Range Reactor Trip~~	1 x 10 $^{-4}$ % of RATED THERMAL POWER	≥ 6 x 10 $^{-5}$ % of RATED THERMAL POWER	LA07
16.e	20. Power Range Neutron Flux (~~not~~ P-10) ~~Input to Low Power Reactor Trips Block P-7~~	10% of RATED THERMAL POWER	≤ 12.4% of RATED THERMAL POWER	A21
16.f	21. Turbine Impulse Chamber Pressure -(P-13) ~~Input to Low Power Reactor Trips Block P-7~~	10% Turbine Impulse Pressure Equivalent	≤ 12.4% Turbine Impulse Pressure Equivalent	
16.c	22. Power Range Neutron Flux - (P-8) ~~Low Reactor Coolant Loop Flow, and Reactor Trip~~	35% of RATED THERMAL POWER	≤ 37.4% of RATED THERMAL POWER	LA07
16.e	23. Power Range Neutron Flux - (P-l0) - ~~Enable block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips~~	10% of RATED THERMAL POWER	≥ 7.6% of RATED THERMAL POWER	
	24. Reactor Trip P-4	Not Applicable	Not Applicable	See ITS 3.3.2
16.d	25. Power Range Neutron Flux - (P-9) ~~Blocks Reactor Trip for Turbine - Trip Below 50% Rated Power~~	50% of RATED THERMAL POWER	≤ 52.4% of RATED THERMAL POWER	LA07

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

Note 1

NOTE 1:

$$\text{Overtemperature } \Delta T \left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \le \Delta T_0 \left\{K_1 - K_2 \left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)[T - T'] + K_3 (P - P') - f_1(\Delta I)\right\}$$

Where:

~~$\frac{1+\tau_4 S}{1+\tau_5 S}$~~ ~~=~~ ~~Lead-lag compensator on measured ΔT~~

LA08

~~τ_4, τ_5~~ = ~~Time constants utilized in the lead-lag controller for ΔT~~, $\tau_4 \ge$ ~~5~~ secs, $\tau_5 \le$ ~~3~~ sec.

ΔT_0 = Indicated ΔT at RATED THERMAL POWER

K_1 ≤ ~~1.15~~

K_2 ≤ ~~0.011~~

*

LA09

~~$\frac{1+\tau_1 S}{1+\tau_2 S}$~~ ~~=~~ ~~The function generated by the lead-lag controller for T_{avg} dynamic compensation~~

LA08

~~τ_1 & τ_2~~ ~~=~~ ~~Time constants utilized in the lead-lag controller for T_{avg}~~, $\tau_1 \ge$ ~~33~~ secs., $\tau_2 \le$ ~~4~~ secs.

*

LA09

T = Average temperature °F

T' ≤ ~~578.2~~°F (T_{avg} at RATED THERMAL POWER)

K_3 = ~~0.00055~~

P = Pressurizer pressure, psig

P' = ~~2235~~ psig (Nominal RCS operating pressure)

Table 3.3.1-1

TABLE 2.2-1 (Continued)
REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Note 1 NOTE 1: (Continued)

S = Laplace transform operator (sec^{-1})

and $f_1(\Delta I)$ is a function ~~of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests~~ such that: LA08

(i) for q_t - q_b between QTNL* and QTPL* $f_1(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QTPL*, the ΔT nominal trip setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

Note 2 NOTE 2: Overpower

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 \; (T - T'') - f_2 \; (\Delta I)\right\}$$

Where: ~~$\frac{1+\tau_4 S}{1+\tau_5 S}$ = as defined in Note 1~~ LA08

These values denoted with * (including) LA09

*QTNL, QTPL, QTNS, and QTPS are specified in the COLR per Specification 6.9.1.14.

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Note 2

NOTE 2: (Continued)

τ_4, τ_5 = as defined in Note 1

ΔT_0 = as defined in Note 1

K_4 ≤ ~~1.087~~

*

LA09

K_5 ≥ ~~0.02~~/°F for increasing average temperature and ~~0~~ for decreasing average temperature

~~$\frac{\tau_3 S}{1 + \tau_3 S}$~~ ~~=~~ ~~The function generated by the rate-lag controller for T_{avg} dynamic compensation~~

LA08

τ_3 = ~~Time constant utilized in the rate-lag controller for T_{avg},~~ τ_3 ≥ ~~10~~ secs.

*

LA09

K_6 ≥ ~~0.0011~~ for T > T" and K_6 ≥ ~~0~~ for T ≥ T"

T = as defined in Note 1

T" = Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ ~~578.2~~°F)

*

LA09

S = as defined in Note 1

and $f_2(\Delta I)$ is a function ~~of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests~~ such that:

LA08

(i) for q_t - q_b between QPNL* and QPPL* $f_2(\Delta I)$ = 0 (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and q_t + q_b is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QPNL* the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QPPL* the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

These values denoted with * (including

)

LA09

*QPNL, QPPL, QPNS, and QPPS are specified in the COLR per Specification 6.9.1.14.

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

Note 1 NOTE 3: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.9 percent ΔT span.

Note 2 NOTE 4: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.7 percent ΔT span.

Note 3 NOTE 5: Trip Time Delay - Steam Generator Water Level--Low-Low

$T_s = \{(-0.00583)(P)^3 + (0.735)(P)^2 - (33.560)(P) + 649.5\}\{0.99\}$ secs.

$T_m = \{(-0.00532)(P)^3 + (0.678)(P)^2 - (31.340)(P) + 589.5\}\{0.99\}$ secs.

Where:

P = RCS Loop ΔT Equivalent to Power (% RTP), P $\underline{*}$ 50% RTP

T_s = Time delay for Steam Generator Water Level--Low-Low Reactor Trip, one Steam Generator affected (secs).

T_m = Time delay for Steam Generator Water Level--Low-Low Reactor Trip, two or more Steam Generators affected (secs).

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 Unit 1 CTS 3.3.1.1 and Unit 2 CTS 3.3.1 ACTION and CTS Table 3.3-1 provide the compensatory actions to take when reactor trip system (RTS) instrumentation is inoperable. ITS 3.3.1 ACTIONS similarly provide the compensatory actions for inoperable RTS Instrumentation. 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 Required Channel's description modifies Functions 10, 11, 12, 13, and 18, separate Condition entry is allowed within a Function on a per bases for Function 10 (Reactor Coolant Flow - Low) on a per loop basis; for Function 11 (Undervoltage RCPs) on a per bus basis; for Function 12 (Underfrequency RCPs) on a per bus basis; for Function 13 (Steam Generator (SG) Water Level Low-Low) on a per SG basis; and for Function 18 (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms) on a per RTB basis. This changes the CTS by providing a specific allowance to enter the Action for each inoperable RTS 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 RTS instrumentation Function to be separate and independent from the others. In addition, the channels associated with Functions 10, 11, 12, 13, and 18 are allowed separate Condition entry on the specified basis (i.e., loop, SG, or RTB) because the channels associated with each loop or steam generator, as applicable, will provide the associated RTS 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.

A03 CTS 4.3.1.1.3 requires REACTOR TRIP SYSTEM RESPONSE TIME testing of "each" reactor trip function. ITS SR 3.3.1.14 is the REACTOR TRIP SYSTEM RESPONSE TIME testing Surveillance, but in ITS Table 3.3.1-1, it is only required for Functions 2.a (Power Range Neutron Flux - High), 2.b (Power Range Neutron Flux - Low), 3.b (Power Range Neutron Flux Rate - High Negative Rate), 6 (Overtemperature ΔT), 7 (Overpower ΔT), 8.a Pressurizer Pressure - Low), 8.b (Pressurizer Pressure - High), 10 (Reactor Coolant Flow - Low), 11 (Undervoltage RCPs), 12 (Underfrequency RCPs), and 13 (Steam Generator Water Level - Low Low). This changes the CTS by specifically stating that the Surveillance is only applicable to certain Functions, not "each" function.

The purpose of CTS 4.3.1.1.3 is to ensure that the actuation response times are less than or equal to the maximum values assumed in the accident analysis. UFSAR Table 7.2.1-5 specifies response times for those RTS Functions assumed in the SQN safety analyses. The Functions requiring a response time test are those Functions requiring ITS SR 3.3.1.14. This change is acceptable because ITS 3.3.1 requires REACTOR TRIP SYSTEM RESPONSE TIME testing (ITS SR 3.3.1.14) for only those Functions listed with response times in UFSAR Table 7.2.1-5. Although the tables containing the specific response time requirements are located in the UFSAR, any changes must continue to be evaluated in accordance with 10 CFR 50.59. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS 4.3.1.1.3 states, in part, that the RTS RESPONSE TIME of each trip function shall be demonstrated to be within its limit at least once per 18 months. The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1. ITS SR 3.3.1.14 requires the verification of RTS RESPONSE TIME every 18 months "on a STAGGERED TEST BASIS." The ITS definition of STAGGERED TEST BASIS is consistent with the CTS testing Frequency. This changes the CTS by utilizing the ITS definition of STAGGERED TEST BASIS.

This change is acceptable because the requirements for RESPONSE TIME testing for the RTS channels remain unchanged. The ITS definition of STAGGERED TEST BASIS and its application in this requirement do not change the current testing frequency requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 CTS Table 3.3-1 specifies the "TOTAL NO. OF CHANNELS" and the "MINIMUM CHANNELS OPERABLE" associated with each RTS Functional Unit. For CTS Table 3.3-1 Functional Units 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, and 18.A, the number of channels listed in the "TOTAL NO. OF CHANNELS" column is greater than that listed in the "MINIMUM OPERABLE CHANNELS" column. CTS Table 3.3-1 ACTIONS 2, 6, 7, 9, 10, and 11, specify the actions to take with the number of channels OPERABLE one less than required by the "TOTAL NO. OF CHANNELS" column. CTS Table 3.3-1 ACTIONS 1, 3, 4, 8, 12, and 16, specify the actions to take with the number of channels OPERABLE, one less than required by the "MINIMUM CHANNELS OPERABLE" column. ITS LCO 3.3.1 requires the RTS instrumentation for each Function in ITS Table 3.3.1-1 to be OPERABLE, including only one column titled "REQUIRED CHANNELS," and ITS 3.3.1 ACTION A specifies the action to take under the CONDITION where one or more Functions have one or more "Required Channels" or trains inoperable. For CTS Table 3.3-1 Functional Unit 12, 13, 14.A, and 14.B, the description in the "MINIMUM CHANNELS OPERABLE" column includes the phrase "in each operating loop," or "in each Operating Stm. Gen." These descriptions are not included in ITS Table 3.3.1-1 Functions 10, 13.a, and 13.b. For Functional Units 14.C, 16, and 17 the "TOTAL NO. OF CHANNELS" column contains two equivalent description of either a value (e.g., 4) or a per basis (e.g., 1/loop); the per basis is chosen for these Functional Units as listed for similar ISTS Functions

12, 13, and 14. This changes the CTS by a) changing the title of the "MINIMUM CHANNELS OPERABLE" column to "REQUIRED CHANNELS," b) matching the number of channels listed in the "REQUIRED CHANNELS" column to the number listed in the "TOTAL NO. OF CHANNELS" column where action is required if the number of OPERABLE channels are less than the Total Number of Channels, c) deleting the description "in each operating loop" and "in each Operating Stm. Gen".

This change is acceptable because the requirements for when actions must be taken remain unchanged. The "REQUIRED CHANNELS" column reflects the current requirements in the CTS ACTIONS for when actions are required to be taken. For CTS Functional Units 1, 5, 6.A, 19, 20.A, 20.B, 21.A, 21.B, 22.A, 22.B, and 22.E, action is required when the number of OPERABLE channels falls below the "MINIMUM CHANNELS OPERABLE" column, the number entered into the ITS "REQUIRED CHANNELS" column. For CTS Functional Units 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14.A, 14.B, 14.C, 14.D, 16, 17, 18.A, and 18.B, action is required when the number of OPERABLE channels falls below the "TOTAL NO. OF CHANNELS" column, the number entered into the ITS "REQUIRED CHANNELS" column. For CTS Table 3.3-1 Functional Units 12, 13, 14.A, and 14.B, the description "in each operating loop" or "in each operating Stm. Gen." is not necessary because all loops, including steam generators, are required to be operating in MODES 1 and 2. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 CTS Table 3.3-1 Functional Unit 2 requires the Power Range Neutron Flux channels to be OPERABLE in MODES 1 and 2. ITS Table 3.3.1-1 Function 2.a requires the Power Range Neutron Flux - High channels to be OPERABLE in MODES 1 and 2 and ITS Table 3.3.1-1 Function 2.b requires the Power Range Neutron Flux – Low channels to be OPERABLE in MODE 1 below the P-10 interlock (as indicated in ITS Table 3.3.1-1 Footnote (d)) and MODE 2. This changes the CTS by splitting CTS Table 3.3-1 Functional Unit 2 into two distinct functions, Power Range Neutron Flux - High and Power Range Neutron Flux - Low, and placing the allowances of the P-10 Function requirements associated with the Power Range Neutron Flux - Low channels into the Applicability statement.

This change is considered acceptable because the P-10 interlock permits power escalation by allowing the block of the Power Range Neutron Flux – Low Setpoint reactor trip function above the P-10 interlock after satisfactory operation and permissive information are obtained from two of four power range channels. The Power Range Neutron Flux - Low channels are not required to trip the unit when the THERMAL POWER is above the P-10 interlock. The Power Range Neutron Flux - High channels provide the appropriate protection in this THERMAL POWER range. This change is designated as administrative because it does not result in a technical change to the CTS.

A07 CTS Table 3.3-1, Functional Unit 5 requires the Intermediate Range Neutron Flux channels to be OPERABLE in MODES 1 and 2. CTS Table 3.3-1 ACTION 3.a specifies that below the P-6 setpoint an inoperable Intermediate Range Neutron Flux channel must be restored to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint. CTS Table 3.3-1

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ACTION 3.d, for one inoperable channel, and ACTION 17, for two inoperable channels, states that above 10% of RTP the provisions of Specification 3.0.3 are not applicable. ITS Table 3.3.1-1, including Footnotes (d) and (e), requires Function 4, the Intermediate Range Neutron Flux channels, to be OPERABLE in MODE 1 below the P-10 interlocks and MODE 2 above the P-6 interlocks. This changes the CTS by placing the allowances of CTS Table 3.3-1 ACTIONS 3.a, 3.d, and 17 into the Applicability statement.

The purpose of the Intermediate Range function is to provide protection against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This change is acceptable because the P-10 interlock prevents the block of the Intermediate Range Neutron Flux reactor trip function below the P-10 setpoint. The Intermediate Range Neutron Flux channels are not required to trip the unit when THERMAL POWER is above the P-10 interlock. The Power Range Neutron Flux channels provide the appropriate protection in this THERMAL POWER range. During THERMAL POWER levels below the P-6 interlock, the Source Range Neutron Flux channels provide the appropriate protection in this THERMAL POWER range. In addition, because the Applicability limits the LCO to conditions below P-10 it is unnecessary to state that the provisions of Specification 3.0.3 do not apply. The change is administrative because the CTS ACTIONS and interlocks do not require the channels to be OPERABLE outside of the specified Applicability. This change is designated as administrative because it does not result in a technical change to the CTS.

A08 CTS Table 3.3-1 Functional Unit 6.A requires the Source Range Neutron Flux channels to be OPERABLE in MODE 2, as modified by CTS Table 3.3-1 Note ##. CTS Table 3.3-1 Note ## specifies that the Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint. ITS Table 3.3.1-1, including Footnote (f), requires Function 5, the Source Range Neutron Flux channels, to be OPERABLE in MODE 2 below the P-6 interlock. This changes the CTS by specifically stating that the Source Range Neutron Flux channels are only required in MODE 2 below the P-6 interlock.

The purpose of the source range neutron flux trip function is to ensure that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This change is acceptable because the P-6 interlock prevents the block of the Source Range Neutron Flux reactor trip function below the P-6 interlock. Above the P-6 interlock setpoint the applicable safety analyses do not assume the source range function is OPERABLE to mitigate an event. Furthermore, CTS Table 3.3-1 Note ## specifically states that the Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint, which renders the Source Range Neutron Flux channels inoperable. This change is designated as administrative because it does not result in a technical change to the CTS.

A09 CTS Table 3.3-1 does not include LCO requirements for the reactor trip bypass breakers; none are listed in CTS Table 3.3-1. However, CTS Table 4.3-1 Functional Unit 23 includes Surveillance Requirements for these breakers, and requires them to be performed in MODES consistent with the Surveillances for the reactor trip breakers (Functional Unit 20). ITS Table 3.3.1-1 Function 17

(Reactor Trip Breakers) includes Footnote (i), which states the Reactor Trip Breakers Function includes any reactor trip bypass breakers that are racked in and closed for bypassing a reactor trip breaker. This changes the CTS by explicitly stating when the reactor trip bypass breakers are required to be OPERABLE.

The reactor trip bypass breakers are used during testing of the associated reactor trip breaker; otherwise they are not racked in or closed. This change is acceptable because CTS 3.3.1.1, Unit 1, and CTS 3.3.1, Unit 2, do not explicitly require the reactor trip bypass breakers to be OPERABLE as they are not listed in CTS Table 3.3-1. However, the reactor trip bypass breakers are required to be OPERABLE when they are replacing the reactor trip breakers. Thus, even though they are listed in CTS Table 4.3-1, the breakers are not required to meet the Surveillance Requirements when not racked in and closed, because they are not replacing the reactor trip breakers. This change is designated as administrative because it does not result in any technical changes to the CTS.

A10 CTS Table 3.3-1 Functional Unit 20 requires the Reactor Trip Breakers to be OPERABLE, while CTS Table 4.3-1 Functional Unit 20 specifies Surveillance Requirements for the Reactor Trip Breakers as well as the Shunt Trip and Undervoltage Trip Functions. CTS 3.3-1 ACTION 15 provides compensatory actions for when the undervoltage or shunt trip feature is inoperable, while ACTION 12 specifies the compensatory actions for when the Reactor Trip Breakers are inoperable or when there is an inoperable diverse trip feature for greater than 48 hours. ITS 3.3.1-1 Function 17 specifies the requirements for the Reactor Trip Breakers, while Function 18 specifies the requirements for the Reactor Trip Breaker Shunt Trip and Undervoltage Functions (one of each trip feature per Reactor Trip Breaker is required to be OPERABLE). This changes the CTS by splitting the Reactor Trip Breaker Functional Unit into two separate Functions, the Reactor Trip Breaker Function (Function 17) and Reactor Trip Breaker Undervoltage and Shunt Trip Mechanism Function (Function 18).

This change is considered acceptable because the proposed requirements are consistent with current requirements. The CTS currently provides different compensatory actions for when an Undervoltage or Shunt Trip Mechanism is inoperable and when a Reactor Trip Breaker is inoperable for other reasons than Undervoltage and Shunt Trip Mechanism inoperabilities. Therefore, the separated requirements are consistent with the CTS. This change is designated as administrative because it does not result in a technical change to the CTS.

A11 CTS Table 3.3-1 Functional Unit 22.B (Power Range Neutron Flux, P-7), Minimum Channels OPERABLE column, requires three (3) channels OPERABLE. ITS Table 3.3.1-1, Function 16.b (Low Power Reactor Trips Block, P-7), Required Channels column, requires "1 per train" OPERABLE. This changes the CTS by identifying the P-7 interlock as a logic Function with train and not channel identity.

The purpose of the P-7 interlock is to permit startup by blocking Pressurizer Pressure - Low, Pressurizer Water Level - High, Reactor Coolant Flow - Low (low flow in two or more RCS loops), Undervoltage Reactor Coolant Pumps (RCPs), and Underfrequency RCPs reactor trips below the P-7 interlock setpoint (approximately 10% power) and to enable these functions when above the P-7 interlock setpoint to provide protection against violating the DNBR limit. The Low Power Reactor Trips Block, P-7 interlock is actuated by input from the Power Range Neutron Flux, P-10 interlock, or the Turbine Impulse Pressure, P-13 interlock. The P-10 and P-13 interlocks retain the channel identity associated with the P-7 interlock in CTS. The P-7 interlock receives four inputs from nuclear instrumentation and two inputs from turbine impulse pressure. These inputs are combined such that the actual P-7 interlock 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 any technical changes to the CTS.

A12 CTS Table 3.3-1, including Note *, requires Functional Units 1 (Manual Reactor Trip) and 6 (Source Range, Neutron Flux) channels to be OPERABLE with the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal. In addition, CTS Table 4.3-1 requires Functional Unit 6 (Source Range, Neutron Flux) channels to be tested in MODES 3 (below P-6), 4, and 5. ITS Table 3.3.1-1, including Footnote (a), requires Functions 1 (Manual Reactor Trip) and 5 (Source Range Neutron Flux) channels to be OPERABLE in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or with one or more rods not fully inserted. This changes the CTS by specifically stating that the CTS Table 3.3-1 Note Applicability applies in MODES 3, 4, and 5. In addition, this changes the CTS by matching the MODES the Source Range Neutron Flux channels are to be tested with the MODES in which the channels are required to be OPERABLE. The change concerning the details of the reactor trip breakers is discussed in DOC LA04 and the change that adds the requirement concerning the position of the rods is discussed in DOC M04.

The purpose of the RTS instrumentation is that it must be OPERABLE so that the rods can be inserted in response to a reactivity excursion. This change is acceptable since it is only clarifying the actual MODES, other than MODES 1 and 2, in which fuel is in the vessel. In addition, while CTS Table 4.3-1 lists MODES 3, 4, and 5 for the Applicability of the two Functional Units, the ITS clarifies that the channels are only required to be tested when they are required to be OPERABLE, consistent with CTS 4.0.1 (ITS SR 3.0.1). This change is designated as administrative because it does not result in a technical change to the CTS.

A13 CTS Table 3.3-1 and Table 4.3-1 Note * modifies the Applicable MODES and MODES for which surveillances are required by stating, in part, "and fuel in the reactor vessel." ITS Table 3.3.1-1 contains a similar MODE modifying note, Note (a), but does not contain the phrase, "and fuel in the reactor vessel". ITS Section 1.1, Definitions, includes the definition of a MODE and states that a MODE corresponds to specific conditions specified in Table 1.1-1 with fuel in the reactor vessel. This changes the CTS by moving the modifying statement concerning fuel in the reactor vessel from the note to the MODE definition.

The purpose of the statement in CTS Table 3.3-1 and Table 4.3-1 Note * modifying the Applicable MODE to only when fuel is in the reactor vessel is to limit the Applicable MODES or other specified conditions the associated Functional Units are required to be OPERABLE or their associated surveillances required. ITS includes this same limitation in the definition of MODES. This change is designated as administrative because it does not result in technical changes to the CTS.

A14 CTS Table 3.3-1, ACTION 7, states that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours. Thus, if after 6 hours the inoperable channel has not been placed in the tripped condition 4 hours is allotted to reduce THERMAL POWER to less than P-9. ITS LCO 3.3.1 ACTION L, requires that if one turbine trip channel is inoperable to place the channel in the tripped condition within 72 hours or reduce THERMAL POWER to < P-9 within 76 hours. Thus, if after 72 hours the inoperable channel has not been placed in the tripped condition 4 hours is allotted to reduce THERMAL POWER to less than P-9. Refer to DOC L05 for increasing the time to place an inoperable channel in trip. This changes the CTS by compensating for the increase Completion Time for placing a channel in a tripped condition retaining the same allotted time for power reduction.

The purpose to CTS Table 3.3-1, ACTION 7 Completion Time of 10 hours is to provide for the period allocated to placing the channel in a tripped condition then allow a period to reduce THERMAL POWER to less than the P-9 setpoint. This period for power reduction, allows for an orderly shutdown without challenging unit systems. Once the allotted period for placing the channel in a tripped condition has expired without the channel in the tripped condition a power reduction is required such that the unit is < P-9 within an additional 4 hours, 10 hours total. ITS continues to require this power reduction within 4 hours once the period allowed to place the channel in the tripped condition has expired. This change is designated as administrative because it does not result in a technical change to the CTS.

A15 CTS Table 3.3-1 ACTION 8, requires that with less than the Minimum Number of Channels OPERABLE to declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE "or apply the appropriate ACTION statement(s) for those functions," then lists the Functions to be evaluated. ACTION 8 is applicable to the Functional Units 22.A, (Intermediate Range Neutron Flux, P-6); 22.B, (Power Range Neutron Flux, P-7); 22.C (Power Range Neutron Flux, P-8); 22.D (Power Range Neutron Flux, P-10); 22.E (Turbine Impulse Chamber Pressure, P-13); and 22.F (Power Range Neutron Flux, P-9). ITS 3.3.1 ACTIONS O and P require that when one or more applicable channels are inoperable to verify the interlock is in the required state for existing plant conditions within one hour from discovery "or to be in MODE 3, for Required Action O.2, or MODE 2, for Required Action P.2, within 7 hours from discovery." ITS 3.3.1 ACTION O is applicable to Functions 16.a, Intermediate Range Neutron Flux, P-6 and 16.e Power Range Neutron Flux, P-10. ITS 3.3.1 ACTION P is applicable to 16.b, Low Power Reactor Trips Block, P-7; 16.c, Power Range Neutron Flux, P-8; 16.d Power Range Neutron Flux, P-9; and 16.f, Turbine Impulse Pressure, P-13. This changes the CTS by providing specific Required Actions when any of the applicable Functional Units are inoperable and the interlock is not in the required state for existing plant conditions.

The purpose of the Reactor Trip System interlocks is to ensure the associated RTS instrumentation is automatically enabled or disabled when required. This change is acceptable because the proposed ACTIONS ensure that the interlock is in the correct state for the existing unit conditions, manually places the interlock in the correct state for the existing unit conditions, or places the unit in a MODE or specified Condition outside the Applicability of the associated interlock. ITS 3.3.1 Required Action O.1 and P.1 require the interlock to be placed in the same state as it would be in if it were functioning properly (i.e., this performs the intended function of the interlock). If Required Actions O.1 or P.1 are not completed within 1 hour, then ITS 3.3.1 Required Actions O.2 and P.2 require the unit to be placed in a MODE or specified condition that is outside the Applicability of the associated interlock. With the unit placed in a MODE or specified condition that is outside the Applicability of the associated interlock, the interlock is no longer required to function to support the OPERABILITY of the associated RTS Instrumentation Function. The Required Actions and Completion Times for placing the unit in the MODES or specified conditions outside the Applicability of the interlocks are consistent with the Required Actions and Completion Times associated with exiting the Applicability for CTS RTS Interlock Functions supported by the interlocks. In CTS, if an RTS Interlock Functional Unit is inoperable and cannot be placed in the correct state for the existing unit conditions CTS 3.0.3 is entered. CTS 3.0.3 would be entered because multiple channels for the affected Functional Units would be inoperable and the associated CTS ACTIONS, except for Functional Unit 5 (Intermediate Range, Neutron Flux), do not contain Actions for multiple inoperable channels. Although CTS Table 3.3-1 Functional Unit 5 has associated ACTIONS for multiple channels inoperable, the other associated Functional Units do not and CTS 3.0.3 would be entered. When CTS 3.0.3 is entered, 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: 1) At least HOT STANDBY [MODE 3] within the next 6 hours, 2) At least HOT SHUTDOWN [MODE 4] within the following 6 hours, and 3) At least COLD SHUTDOWN [MODE 5] within the subsequent 24 hours. For CTS Table 3.3-1 Functional Units 22.A (Intermediate Range Neutron Flux, P-6) and 22.D (Power Range Neutron Flux, P-10) that have a MODE of Applicably of MODE 2 and MODES 1 and 2, respectively, once CTS 3.0.3 is entered 7 hours is allowed to reach MODE 3, exiting the MODE of Applicability. In ITS, Table 3.3.1-1 for Functions 16.a (Intermediate Range Neutron Flux, P-6) and 16.e (Power Range Neutron Flux, P-10) requires entry into Required Action O.1 verifying the interlock is in the required state for plant conditions or performing Required Action O.2, placing the unit in MODE 3 within 7 hours. Similarly, for CTS Table 3.3-1 Functional Units 22.B (Power Range Neutron Flux, P-7), 22.C (Power Range Neutron Flux, P-8), 22.E (Turbine Impulse Chamber Pressure, P-13), and 22.F (Power Range Neutron Flux, P-9) have a MODE of Applicably of MODE 1 and once CTS 3.0.3 is entered 7 hours is allowed to reach MODE 2, exiting the MODE of Applicability. In ITS Table 3.3.1-1 Functions 16.b (Low Power Reactor Trips Block, P-7), 16.c (Power Range Neutron Flux, P-8), 16.f (Turbine Impulse Pressure, P-13), and 16.d (Power Range Neutron Flux, P-9) require performing Required Action P.1 verifying the interlock is in the required state for plant conditions or performing Required Action P.2, placing the unit in MODE 2 within 7 hours. Therefore, the Required Actions and associated Completion Times for an inoperable RTS Interlock Function are the same in CTS as in ITS. This change is designated as administrative because it does not result in technical changes to the CTS.

A16 CTS Table 3.3-1, ACTION 15, associated with Functional Unit 20.A (Reactor Trip Breakers, Startup and Power Operation), in part, states, "With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to OPERABLE status within 48 hours or declare the breaker inoperable and apply ACTION 12." CTS ACTION 12, in part, states, "With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours." ITS LCO 3.3.1, ACTION Q, associated with Function 18 (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms), requires that with one trip mechanism inoperable for one RTB to restore the inoperable trip mechanism to OPERABLE status within 48 hours or be in MODE 3 within 54 hours. This changes the CTS by combining the actions required when a RTB diverse trip mechanism is inoperable into one ITS ACTION.

This change is acceptable because the Required Actions for an inoperable RTB diverse trip mechanism (undervoltage or shunt trip attachment) are the same in CTS as in ITS. In CTS if a diverse trip mechanism is inoperable ACTION 15 allows 48 hours to restore trip mechanism to OPERABLE. In ITS, if a diverse trip mechanism is inoperable Required Action Q.1 allows 48 hours to restore the trip mechanism to OPERABLE. In CTS, once the 48-hour restoration completion time has expired ACTION 12 requires placing the plant in MODE 3 within six (6) hours. In ITS, Required Action Q.2 is an alternative to restoring the inoperable diverse trip mechanism to OPERABLE and requires placing the unit in MODE 3 within 54 hour (48 hours + 6 hours = 54 hours). This change results in a format change only to comply with the manner in which the ISTS presents the requirements. This change is designated as an administrative change because it does not result is any technical changes to the CTS.

A17 CTS Table 4.3-1 provides a column designating "MODES FOR (IN) WHICH SURVEILLANCE IS REQUIRED." ITS Table 3.3.1-1 does not provide this specific column but includes this information in the "Applicable MODES or other Specified Conditions" column. This changes the CTS by combining the information stating when a Surveillance is required with the information stating the Applicable MODES the instruments are required to be OPERABLE into one column in the ITS that indicates both when the functions are required to be OPERABLE and when the SRs are required to be met.

CTS 4.0.1 states that Surveillance Requirements shall be met during the MODES or other specified conditions in the Applicability for individual Limiting Condition for Operation, unless otherwise stated in the individual Surveillance Requirement. ITS SR 3.0.1 states that surveillance requirements (SRs) shall be met during the MODES or other specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. For these Functional Units the "MODES for which Surveillance is Required" from CTS Table 4.3-1 are the same as that in the "Applicable MODES" column from CTS Table 3.3-1. Any changes to the "Applicable MODES" from CTS to ITS are covered by DOCs identified in CTS Table 3.3-1. This change is designated as administrative because it does not result in technical changes to the CTS.

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A18 CTS Table 4.3-1 Functional Unit 2 (Power Range, Neutron Flux) requires a CHANNEL CALIBRATION to compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER (Note 3). ITS Table 3.3.1-1, Function 6 (Overtemperature ΔT) requires a similar surveillance SR 3.3.1.3, to compare results of the incore detector measurements to Nuclear Instrument System (NIS) AFD and to adjust the NIS if the absolute difference is ≥ 3%. This changes the CTS by moving the requirement comparing the incore to excore Axial Flux Difference from the Power Range Neutron Flux Functional Unit to the Overtemperature ΔT Function.

The purpose of CTS Table 4.3-1 Note 3 is to compare incore to excore AXIAL FLUX DIFFERENCE and recalibrate if the absolute difference is greater than or equal to 3 percent. ITS SR 3.3.1.3 provides a similar surveillance. The difference is that the CTS surveillance is associated with Power Range Neutron Flux while the ITS surveillance is associated with Overtemperature ΔT. The Power Range AFD output provides a signal to the Overtemperature ΔT channel. In CTS, as in ITS, if this surveillance was not met the Power Range Instrument would still be able to accurately provide the high and low trip functions while the Overtemperature ΔT would not. Because CTS Table 4.3-1 Note 3 and ITS SR 3.3.1.3 support the OPERABILITY of the Overtemperature ΔT function, ITS lists this Surveillance Requirement as associated with the Overtemperature ΔT Function. This change is acceptable because a similar surveillance is being performed in ITS as was performed in CTS and the affected Function remains the same. This change is designated as administrative because it does not result in technical changes to the CTS.

A19 CTS Table 4.3-1 requires CHANNEL CALIBRATION for Functional Units 7 (Overtemperature Delta T), 8 (Overpower Delta T), 9 (Pressurizer Pressure—Low), 10 (Pressurizer Pressure—High), 11 (Pressurizer Water Level—High), 12 (Loss of Flow - Single Loop), 13 (Loss of Flow - Two Loops), 14.A (Steam Generator Water Level--Low-Low – Steam Generator Water Level—Low-Low (Adverse)), 14.B (Steam Generator Water Level--Low-Low – Steam Generator Water Level Low-Low (EAM)), 14.C (Steam Generator Water Level--Low-Low – RCS Loop ΔT), 14.D (Steam Generator Water Level--Low-Low – Containment Pressure (EAM)), 16 (Undervoltage - Reactor Coolant Pumps), 17 (Underfrequency - Reactor Coolant Pumps), and 18.A (Turbine Trip – Low Fluid Oil Pressure), and 18.B (Turbine Trip – Turbine Stop Valve Closure). ITS SR 3.3.1.10 requires similar CHANNEL CALIBRATION for Functions 6 (Overtemperature ΔT), 7 (Overpower ΔT), 8.a (Pressurizer Pressure—Low), 8.b (Pressurizer Pressure—High), 9 (Pressurizer Water Level—High), 10 (Reactor Coolant Flow-Low), 11 (Undervoltage RCPs), 12 (Underfrequency RCPs), 13.a (Steam Generator Water Level--Low-Low (Adverse)), 13.b (Steam Generator Water Level--Low-Low (EAM)), and 18.a (Turbine Trip - Low Fluid Oil Pressure), and 18.b (Turbine Trip - Turbine Stop Valve Closure). ITS SR 3.3.1.10 is modified by a Note stating, "This Surveillance shall include verification that the time constants are adjusted to the prescribed values." This changes the CTS by adding specific guidance that the time constant adjustment, as applicable, is part of the CHANNEL CALIBRATION for these Functional Units.

CTS 1.19, OPERABLE-OPERABILITY definition, in part, states, "A system, subsystem, train, or component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation . . . . to perform its function(s) are also capable of performing their related support function(s)." ITS OPERABLE-OPERABILITY definition, in part, states, "A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation . . . to perform its specified safety function(s) are also capable of performing their related support function(s). For CTS, as in ITS, the related time constants of an instrument channel are required to be set properly. To ensure they are set properly verification is required. By stating in the surveillance requirement that the CHANNEL CALIBRATION requires verification of the time constants restates what OPERABILITY requires. This change is designated as administrative because it does not result in technical changes to the CTS.

A20 CTS Table 4.3-1 requires CHANNEL FUNCTIONAL TEST for Functional Units 1 (Manual Reactor Trip), 16 (Undervoltage - Reactor Coolant Pumps), 17 (Underfrequency - Reactor Coolant Pumps), 18.A (Turbine Trip, Low Fluid Oil Pressure), 18.B (Turbine Trip, Turbine Stop Valve Closure), and 19 (Safety Injection Input from ESF). ITS Table 3.3.1-1 requires similar tests; ITS SR 3.3.1.9 (TADOT) to be performed for Functions 11 (Undervoltage RCPs) and 12 (Underfrequency RCPs); ITS SR 3.3.1.12 (TADOT) to be performed for Functions 1 (Manual Reactor Trip) and 15 (Safety Injection (SI) from Engineered Safety Feature Actuation System (ESFAS)); and ITS SR 3.3.1.13 (TADOT) to be performed for Functions 14.a (Turbine Trip, Low Fluid Oil Pressure) and 14.b (Turbine Trip, Turbine Stop Valve Closure) with the addition of a Note that states, "Verification of setpoint is not required." This changes the CTS by requiring a TADOT without setpoint verification instead of a CHANNEL FUNCTIONAL TEST.

CTS 1.6 states that for an analog channel a CHANNEL FUNCTIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions. ITS 1.1 defines a TADOT as consisting of operating the trip actuating device and verifying the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. ITS further states that the TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. Because the TADOT includes adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy, which is not included in the CTS CHANNEL FUNCTIONAL TEST, ITS SR 3.3.1.9, SR 3.3.1.12, and SR 3.3.1.13 include the Note, "Verification of setpoint is not required." A TADOT without setpoint verification provides a similar test for these channels as the CTS CHANNEL FUNCTIONAL TEST. This change is designated as administrative because it does not result in technical changes to the CTS.

A21 CTS Table 2.2-1 Functional Unit 20 (Power Range Neutron Flux (not P-10) Input to Low Power Reactor Trips Block P-7) includes in its description a parenthetical statement "not P-10". The Allowable Value and Nominal Trip Setpoint for CTS Table 2.2-1 Functional Unit 20 is ≤ 12.4% RTP and 10% RTP, respectively. CTS

Table 2.2-1 Functional Unit 23 (Power Range Neutron Flux - (P-10) - Enable Block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips) Allowable Value and Nominal Trip Setpoint is ≥ 7.6% RTP and 10% RTP, respectively. ITS Table 3.3.1-1 Function 16.e (Power Range Neutron Flux, P-10) is the ITS equivalent of these CTS Functional Units with an Allowable Value of ≥ 7.6% RTP and ≤ 12.4% RTP, and a Nominal Trip Setpoint of 10% RTP. This changes the CTS by combining CTS Table 2.2-1 Functional Units 20 and 23, and removing "not" from the Functional Unit 20 description.

The purpose of separating CTS Table 2.2-1 Functional Units 20 and 23 is to ensure the proper Allowable Value is assigned to the Power Range Neutron Flux bistable associated with P-7 and P-10. One Functional Unit operates when the bistable is set, the other operates when the bistable is reset. CTS Table 2.2-1 Functional Unit 23 is associated with P-10 and has an Allowable Value of ≥ 7.6% RTP. CTS Table 2.2-1 Functional Unit 20 is associated with P-7 and has an Allowable Value of ≤ 12.4% RTP. Both of these Functional Units operate from the same bistable with a Nominal Setpoint of 10%. ITS Table 3.3.1-1 combines these CTS Functional Units into one ITS Function presenting the different Allowable Values as an upper Allowable Value limit (≤ 12.4% RTP) and a lower Allowable Value limit (≥ 7.6% RTP). Because the upper Allowable Value limit is associated with P-7 CTS Table 2.2-1 Functional Unit 20 added the exclusion statement of "not P-10" thus avoiding confusion over the setting of the bistable. ITS avoids this confusion by including both Allowable Values. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.3.1.1.1 requires each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the Frequencies shown in Table 4.3-1. Table 4.3-1 requires performance of a CHANNEL FUNCTIONAL TEST at the Frequencies shown on Table 4.3-1. ITS 3.3.1 requires the performance of a CHANNEL OPERATIONAL TEST (COT), a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT), or an ACTUATION LOGIC TEST. This changes the CTS by changing the CHANNEL FUNCTIONAL 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 CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The ITS ACTUATION LOGIC TEST (ALT), CHANNEL OPERATIONAL TEST (COT), and TRIP ACTUATING DEVICE OPERATION TEST (TADOT) provide similar tests with the addition that the COT and TADOT include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires an additional acceptance criteria that is not currently required in the CTS.

M02 CTS 4.3.1.1.2 requires the logic for the interlocks be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. ITS Table 3.3.1-1 Function 19 (Automatic Trip Logic) and Function 16.B (Reactor Trip System Interlock, Low Power Trips Block, P-7) require the 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 changing the Surveillance Frequency from prior to each reactor startup unless performed during the preceding 92 days to every 92 days on a STAGGERED TEST BASIS and explicitly states this requirement for CTS Functional Unit 22.B (Reactor Trip System Interlock, Low Power Trips Block, P-7).

The purpose of the CTS Table 4.3.1.1.2 CHANNEL FUNCTIONAL TEST requirement is to ensure the Reactor Trip System interlocks are OPERABLE. The change is acceptable because the proposed Surveillance Frequency will require performance of the test every 92 days on a STAGGERED TEST BASIS. This ensures that each interlock train is tested every 184 days, even when the unit is operating. Currently, the test could be performed only once in an 18-month cycle. This change is designated as more restrictive since the ITS will require the test to be performed more frequently than in the CTS.

M03 CTS Table 3.3-1, Functional Units 22.C (Power Range Neutron Flux, P-8), 22.D (Power Range Neutron Flux, P-10), and 22.F (Power Range Neutron Flux, P-9), and ACTION 8 require action be taken with less than the Minimum Number of Channels OPERABLE. CTS Functional Units 22.C, 22.D, and 22.F, Minimum Channels OPERABLE column requires three (3) channels to be OPERABLE for each Functional Unit. ITS Table 3.3.1-1, Functions 16.c (Power Range Neutron Flux, P-8), 16.e (Power Range Neutron Flux, P-10), and 16.d (Power Range Neutron Flux, P-9), Required Channels column, requires four (4) channels to be OPERABLE with ITS LCO 3.3.1 ACTION A requiring action taken if one or more required channels are inoperable. This changes the CTS by requiring more P-8, P-9, and P-10 interlock channels to be OPERABLE and by providing ACTIONS to take when the additional required channel is inoperable.

The purpose of the ITS LCO 3.3.1 channel requirement is to ensure that appropriate compensatory actions are taken if any of the installed channels are inoperable. This change is acceptable because the 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. 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. This change is also acceptable because the 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 Table 3.3-1 requires Functional Units 1 (Manual Reactor Trip), 6.A (Source Range, Neutron Flux, Startup), 20.B (Reactor Trip Breakers – Shutdown), and 21.B (Automatic Trip Logic – Shutdown) channels to be OPERABLE with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel as stated in Table 3.3-1 Note *. CTS Table 4.3-1 specifies the same note, Note *, for designating when the Surveillance Requirements for these Functional Units are required. ITS Table 3.3.1-1, including Footnote (a), requires the Functions 1 (Manual Reactor Trip), 5 (Source Range Neutron Flux), 17 (Reactor Trip Breakers (RTBs)), 18 (Reactor Trip Breaker Undervoltage and Shut Trip Mechanisms), and 19 (Automatic Trip Logic) channels to be OPERABLE in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or with one or more rods not fully inserted. This changes the CTS by requiring the Manual Reactor Trip and the Source Range Neutron Flux Functions to be OPERABLE when one or more rods are not fully inserted irrespective of the condition of the reactor trip breakers or the Control Rod Drive System. The change concerning the details of the reactor trip breakers are discussed in DOC LA04 and the change that adds MODES 3, 4, and 5 is discussed in DOC A12.

The purpose of the RTS instrumentation is that it must be OPERABLE so that the rods can be inserted in response to a reactivity excursion. This change is acceptable because it provides appropriate requirements for when one or more control rods are not fully inserted. This change is designated as more restrictive because it requires the Manual Reactor Trip and the Source Range Neutron Flux Functions to be OPERABLE when one or more rods are not fully inserted irrespective of the condition of the reactor trip breakers or the Control Rod Drive System.

M05 CTS Table 3.3-1 ACTIONS 2 and 6 provide the actions to be taken when their associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that STARTUP (similar to ITS MODE 2) and/or POWER OPERATION (similar to ITS MODE 1) may proceed, provided the listed conditions are satisfied (Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed). However, no action is specified if the listed conditions are not satisfied. Therefore, CTS 3.0.3 applies requiring the plant to be in MODE 3 in 7 hours. Under similar conditions, ITS 3.3.1 Required Actions D.3 and E.2 require the unit to be in MODE 3 within 6 hours. This changes the CTS by reducing the amount of time allowed to place the unit outside the LCO Applicability.

The purpose of CTS Table 3.3-1 ACTIONS 2 and 6 is to provide the actions to be taken when their associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. CTS 3.0.3 provides actions when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements. Because CTS Table 3.3-1 ACTIONS 2 and 6 do not provide any further actions if those listed are not satisfied, CTS 3.0.3 would be entered. CTS 3.0.3 states that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply. CTS Table 3.3-1 ACTIONS 2 and 6 state that STARTUP and POWER OPERATION (MODES 2 and 1, respectively) may proceed if the listed conditions are satisfied (Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed). Therefore, in accordance with CTS 3.0.3, the MODE reached first that the Specification does not apply would be MODE 3. CTS 3.0.3 states, in part, 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 (MODE 3) within the next 6 hours (a total of 7 hours to reach MODE 3). ITS LCO 3.3.1 Required Actions D.3 and E.2 allow 6 hours to reach MODE 3. This change is acceptable because the time allowed to reach MODE 3 from full power conditions can be accomplished in an orderly manner and without challenging plant systems. This change is designated as more restrictive because it reduces the amount of time within which the plant must be placed outside the LCO Applicability.

M06 With one Intermediate Range Neutron Flux channel inoperable, CTS Table 3.3-1 ACTION 3.b, when above the P-6 interlock (Block of the Source Range Reactor Trip) and below 5% of RTP, requires the restoration of the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% RTP. In addition, CTS Table 3.3-1 ACTION 3.c allows unlimited operation with an inoperable Intermediate Range Neutron Flux channel above 5% RTP. ITS 3.3.1 ACTION F, which provides actions for when one Intermediate Range Neutron Flux channel is inoperable, requires either a reduction of THERMAL POWER to < P-6 within 24 hours or the increase in THERMAL POWER to > P-10 within 24 hours. Refer to L09 for discussion of allowing the change in THERMAL POWER to exit MODE of Applicability as an option to restoring the inoperable Intermediate Range channel. This changes the CTS by limiting the time the unit can operate with an inoperable Intermediate Range Neutron Flux channel above 5% RTP but below the P-10 interlock to 24 hours.

This change is acceptable because a time limit is placed on the length of time the unit may operate with an inoperable Intermediate Range Neutron Flux channel at a power level above 5% RTP and below the P-10 interlock. The requirement to allow 24 hours to restore the instrument to OPERABLE status or to leave the Applicability for when the equipment is required to be OPERABLE is reasonable because a protection function has been significantly degraded and 24 hours is a reasonable period to allow for a slow and controlled power adjustment. This change is more restrictive because it restricts the time the unit can operate with an inoperable Intermediate Range Neutron Flux channel.

M07 CTS Table 3.3-1 does not provide an ACTION for two inoperable Intermediate Range Neutron Flux channels when less than or equal to 10% RTP; therefore, CTS 3.0.3 must be entered. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in MODE 3 (HOT STANDBY). ITS 3.3.1

ACTION G provides actions for two inoperable Intermediate Range Neutron Flux channels. ITS 3.3.1 Required Action G.1 requires the immediate suspension of operations involving positive reactivity additions. A Note modifies the Required Action and states, "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM." ITS 3.3.1 Required Action G.2 requires the reduction of THERMAL POWER to < P-6 within 2 hours. This changes the CTS by adding a specific ACTION to cover the condition for two inoperable Intermediate Range Neutron Flux channels when less than or equal to 10% RTP.

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, limited to below the P-10 interlock and above the P-6 interlock by the Intermediate Range Applicability. The proposed ACTION precludes a power level increase and allows a reasonable period for a slow and controlled power adjustment with no Intermediate Range channels OPERABLE. ITS requires the ACTIONS of precluding positive reactivity additions and reducing power. These remedial actions are for safe operation. This change is designated as more restrictive because an explicit ACTION is being added which requires the unit to be at a specific condition in 2 hours, in lieu of the current 7 hour time.

M08 With one Source Range Neutron Flux channel inoperable in MODE 2 below P-6 or with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel, CTS Table 3.3-1 ACTION 4 limits the THERMAL POWER to the P-6 setpoint value until the inoperable channel is restored to OPERABLE status. ITS 3.3.1 ACTION H, which provides the actions for when one Source Range Neutron Flux channel is inoperable in MODE 2 below P-6, requires all operation involving positive reactivity additions to be immediately suspended. A Note modifies the requirement that states limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM. ITS 3.3.1 ACTION J provides the actions for when one Source Range Neutron Flux channel is inoperable during MODE 3, 4, or 5 with Rod Control System capable of rod withdrawal or one or more rods not fully inserted. ITS 3.3.1 ACTION J requires the channel to be restored to OPERABLE status within 48 hours or initiate action to fully insert all rods and place the Rod Control System in a condition incapable of rod withdrawal within one hour. This changes the CTS requirements for an inoperable Source Range Neutron Flux channel by limiting operation involving positive reactivity additions during operations in MODE 2 below the P-6 limit and limits the time a channel can be inoperable during MODE 3, 4, or 5 operations with Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

This change is acceptable because in this condition the number of Source Range Neutron Flux channels, which are the only channels providing protection, has been reduced by 50% and additional restrictions are appropriate. Positive reactivity additions must be either prohibited or minimized to ensure reactivity is maintained in a known and controlled condition. Limited positive reactivity additions, temperature decreases or boron dilutions, are reasonable restraints to place on unit operations when only one Source Range channel is OPERABLE.

With one Source Range Neutron Flux channel inoperable in MODE 3, 4, or 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted, the redundancy of the RTS Instrumentation is lost and therefore the time operation can continue in this condition is limited. This change is more restrictive because plant operations are more limited by the ITS requirements than the CTS.

M09 CTS Table 3.3-1 does not provide an ACTION for two inoperable Source Range Neutron Flux channels; therefore, CTS 3.0.3 must be entered. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in MODE 3. ITS 3.3.1 ACTION I provides actions for two inoperable Source Range Neutron Flux channels and requires the reactor trip breakers to be opened immediately. This changes the CTS by requiring the reactor trip breakers to be opened immediately if both Source Range Neutron Flux channels become inoperable, in lieu of performing a controlled shutdown to MODE 3 in 7 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 into a safe condition. This is accomplished by opening the reactor trip breakers, which inserts all rods. This change is designated as more restrictive because the actions added are more restrictive than are required by the CTS.

M10 CTS Table 3.3-1, ACTION 6 provides the actions to be taken when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that STARTUP (similar to ITS MODE 2) and/or POWER OPERATION (similar to ITS MODE 1) may proceed, provided the listed conditions are satisfied. If those conditions are not satisfied, no specific actions are prescribed; therefore, CTS 3.0.3 would require the unit be placed in a MODE that the Specification does not apply. Several of the Functional Units associated with CTS Table 3.3-1, ACTION 6 have an Applicability of MODE 1 or MODES 1 and 2, and are blocked at low RTP by interlock P-7. The Functional Units blocked at low power by interlock P-7 are 9, Pressurizer Pressure-Low; 11, Pressurizer Water Level-High; 13, Loss of Flow-Two Loops (Above P-7 and below P-8); 16, Undervoltage-Reactor Coolant Pumps; and 17, Underfrequency-Reactor Coolant Pumps. ITS LCO 3.3.1, Required Action K.2, provides a specific action if similar specified conditions are not satisfied for Functions 8.a, Pressurizer Pressure, Low; 9, Pressurizer Water Level – High; 10, Reactor Coolant Flow – Low; 11, Undervoltage RCPs; and 12, Underfrequency RCPs. ITS LCO 3.3.1, Required Action K.2, requires a reduction in THERMAL POWER to < P-7. This changes the CTS by reducing the time allowed to exit the LCO Applicability.

The purpose of CTS Table 3.3-1 ACTION 6 is to prescribe remedial measures required under designated conditions when the associated features are needed to mitigate a design basis accident or transient. This change is considered acceptable because the P-7 interlock prevents or defeats the automatic block of the reactor trip on Pressurizer Pressure - Low, Pressurizer Water Level - High, Loss of Flow-Two Loops, Undervoltage - Reactor Coolant Pumps, and Underfrequency – Reactor Coolant Pumps, above the P-7 interlock. Below the

P-7 interlock, the reactor trips associated with these functions are blocked. This change is designated as more restrictive because less time is allowed for completion of Required Actions in the ITS than were allowed in the CTS.

M11 CTS Table 3.3-1 Functional Unit 18.A (Turbine Trip – Low Fluid Oil Pressure) applicable ACTION is ACTION 6. ACTION 6 states, in part, that with the number of OPERABLE channels one less than the value listed in the Total Number of Channels column STARTUP (MODE 2) and/or POWER OPERATION (MODE 1) may proceed provided the listed conditions that follow are satisfied. For ACTION 6, if those conditions are not satisfied, no specific ACTIONS are prescribed therefore, CTS 3.0.3 would be followed to place the unit in a MODE in which the Specification does not apply. CTS Table 3.3-1 Functional Unit 18.A Applicability is MODE 1 modified by Note **. Note ** states, "Above the P-9 (Power Range Neutron Flux) interlock." CTS 3.0.3 requires, in part, 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. Therefore, CTS allows 7 hours from the time the listed conditions are not satisfied until RTP is required to be reduced below the P-9 power level. ITS LCO 3.3.1, Required Action L.2, provides a specific action if similar specified conditions are not satisfied for Function 14.a, Turbine Trip, Low Fluid Oil Pressure. ITS LCO 3.3.1, Required Action L.2, requires a reduction in THERMAL POWER to < P-9 within 4 hours. This changes the CTS by reducing the amount of time allowed to exit the LCO Applicability.

The purpose of CTS Table 3.3-1 ACTIONS 6 is to provide remedial ACTIONS 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. For CTS Table 3.3-1 ACTION 6 if the specified conditions are not satisfied, CTS 3.0.3 is followed to place the unit in a MODE in which the Specification does not apply within a total of 7 hours (i.e., < P-9 for Functional Unit 18.A). ITS LCO 3.3.1 Required Action L.2 requires THERMAL POWER to be reduced to < P-9 within 4 hours. This change is also acceptable because the time allowed to reduce THERMAL POWER to < P-9 from full power operations can be accomplished in an orderly manner and without challenging plant systems. This change is designated as more restrictive because explicit ACTIONS are being added which require the unit to be at a specific condition sooner in ITS than in CTS.

M12 CTS Table 3.3-1 Functional Units 22.A, (Intermediate Range Neutron Flux, P-6); 22.B, (Power Range Neutron Flux, P-7); 22.C (Power Range Neutron Flux, P-8); 22.D (Power Range Neutron Flux, P-10); 22.E (Turbine Impulse Chamber Pressure, P-13); and 22.F (Power Range Neutron Flux, P-9) associated ACTION 8 requires, in part, that with less than the Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed are OPERABLE. ITS Table 3.3.1-1 Functions 16.a (Intermediate Range Neutron Flux, P-6) and 16.e (Power Range Neutron Flux, P-10) associated Condition when one or more required channels of these Functions are inoperable is Condition O. ITS 3.3.1 Table 3.3.1-4 Functions 16.b (Low Power Reactor Trips Block, P-7), 16.c (Power Range Neutron Flux, P-8), 16.d (Power Range Neutron Flux, P-9), and 16.f (Turbine Impulse Pressure, P-13) associated Condition when one or more required channels of these

Functions are inoperable is Condition P. ITS 3.3.1 Required Action O.1 and P.1 require verifying the interlock is in the required state for existing unit conditions within one hour. This changes the CTS by providing an explicit Completion Time for verification of an inoperable interlock's state.

The purpose of CTS Table 3.3-1 ACTION 8 is to provide remedial ACTIONS that must be taken in response to a degraded RTS interlock condition in order to minimize risk associated with continued operation while providing time to repair the inoperable interlock. CTS and ITS provide similar Required Actions to verify that the failed interlock will not prevent the associated Functional Units from performing their required function. CTS does not provide a Completion Time for verification of the inoperable interlock's state whereas ITS provides a Completion Time of one hour. This change is designated as more restrictive because an explicit Completion Time is added to verify an inoperable RTS interlock is in its required state for unit conditions.

M13 CTS Table 3.3-1 Functional Units 14.A (Steam Generator Water Level—Low-Low (Adverse)) and 14.B (Steam Generator Water Level—Low-Low (EAM)) require entry into ACTION 9 if one channel is inoperable. If the inoperable channel is not placed in the tripped condition within the time specified, entry into CTS 3.0.3 is required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in MODE 3. ITS Table 3.3.1-1 Functions 13.a (Steam Generator (SG) Water Level Low-Low (Adverse)) and 13.b (Steam Generator (SG) Water Level Low-Low (EAM)) require entry into Condition R if one required channel is inoperable. ITS LCO 3.3.1 Required Action R.1 requires adjusting the Trip Time Delay for one affected steam generator (T_S) to match the Trip Time Delay for multiple affected steam generators (T_M) for the affected protection set and Required Action R.2 requires placing the inoperable channel in the tripped condition within a specified Completion Time. If either Required Action R.1 or R.2 cannot be completed within the required Completion Time, ACTION U is entered and requires the unit be in MODE 3 within 6 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 from 7 hours in the CTS to 6 hours in the ITS.

The purpose of CTS Table 3.3-1 ACTION 9 is to provide remedial ACTIONS 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 acceptable because the proposed default condition will require the plant to be in a condition where the RTS instrumentation is no longer required to be OPERABLE. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with current requirements. This change is designated as more restrictive because it reduces the amount of time required to place the unit outside the LCO Applicability.

M14 CTS Table 3.3-1 Functional Unit 14.C (Main Steam Generator Water Level Low-Low, RCS Loop ΔT) requires entry into ACTION 10 if one channel is inoperable. If the requirements of CTS Table 3.3-1 ACTION 10 are not met, entry into CTS 3.0.3 is required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in

MODE 3. ITS Table 3.3.1-1 Functions 13.a (Steam Generator (SG) Water Level Low-Low (Adverse)) and 13.b (Steam Generator (SG) Water Level Low-Low (EAM)) require entry into Condition T if one required RCS Loop ΔT channel is inoperable. ITS LCO 3.3.1 Required Actions T.1 and T.2 require that for the affected protection set, to adjust the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP or trip the affected channels within a specified Completion Time. If the requirements of ITS 3.3.1 Required Actions T.1 or T.2 cannot be met, similar to CTS Table 3.3-1 ACTION 10, ITS 3.3.1 Required Action T.3 is entered. ITS LCO 3.3.1 Required Action T.3 requires the unit be in MODE 3 within an additional 6 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 from 7 hours in the CTS to 6 hours in the ITS.

The purpose of CTS Table 3.3-1 ACTION 10 is to provide remedial ACTIONS 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 acceptable because the proposed Required Action will require the unit to be in a condition where the RTS instrumentation is no longer required to be OPERABLE. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with other CTS and ITS requirements. This change is designated as more restrictive because it reduces the amount of time required to place the unit outside the LCO Applicability.

M15 CTS Table 3.3-1 Functional Unit 14.D (Containment Pressure (EAM)) requires entry into ACTION 11 if one channel is inoperable. If the requirements of ACTION 11 are not met, entry into CTS 3.0.3 is required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in MODE 3. ITS Table 3.3.1-1 Function 13.a (Steam Generator (SG) Water Level Low-Low (Adverse)) requires entry into Condition S if one required Containment Pressure (EAM) channel is inoperable. ITS LCO 3.3.1 Required Actions S.1 and S.2 require that for the affected protection set, to adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level - Low-Low (Adverse) or trip the affected channels within a specified Completion Time. If the requirements of ITS 3.3.1 Required Action S.1 or S.2 cannot be met, similar to CTS Table 3.3-1 ACTION 11, ITS 3.3.1 Required Action S.3 is entered. ITS LCO 3.3.1 Required Action S.3 requires the unit be in MODE 3 within an additional 6 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 after the Required Actions and associated Completion Times are not met from 7 hours in the CTS to 6 hours in the ITS.

The purpose of CTS Table 3.3-1 ACTION 11 is to provide remedial ACTIONS 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 acceptable because the proposed default will require the unit to be in a condition where the RTS instrumentation is no longer required to be OPERABLE. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with other CTS and ITS requirements. This change is designated as more restrictive because it reduces the amount of time required to place the unit outside the LCO Applicability.

M16 CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST for Functional Unit 2 (Power Range, Neutron Flux) quarterly, and Functional Units 5 (Intermediate Range, Neutron Flux) and 6 (Source Range, Neutron Flux) prior to each reactor startup. ITS SR 3.3.1.8 requires performance of a similar test, a COT, for Function 2.b (Power Range Neutron Flux – Low), Function 4 (Intermediate Range Neutron Flux), and Function 5 (Source Range Neutron Flux), but modifies the Frequency stating, "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." This changes the CTS requirement by the addition of requirements to perform the surveillance during a shutdown; within twelve hours after reducing power below P-10 for the power range - low setpoint and for the intermediate range instrumentation, and within four hours after reducing power below P-6 for source range instrumentation.

The purpose of the surveillance requirement is to confirm the OPERABILITY of the affected RTS Functions when they are required. During operation in this low power condition the Power Range Neutron Flux - Low Setpoint, the Intermediate Range Neutron Flux, and the Source Range Neutron Flux RTS trip Functions are required to be OPERABLE. The P-6 and P-10 interlocks function to enable the appropriate RTS Functions depending on the power. The CTS requirements only specify a single CHANNEL FUNCTIONAL TEST prior to startup or Quarterly for the Power Range, Neutron Flux. As the plant is not typically operated in MODE 2 and MODE 1 < 10% RTP for extended periods, the CTS requirements are generally adequate to ensure the OPERABILITY of the required RTS Functions. However, the ITS provides additional requirements that provide additional OPERABILITY verifications in the event that the plant is operated within a low power condition for an extended time. The proposed changes are acceptable because they confirm that the required protection Functions are enabled and maintained OPERABLE in the event that the plant is operated in this low power range for an extended period. As such, the proposed changes provide assurance that the plant continues to be operated consistent with the applicable safety analysis assumptions. This change is designated as more restrictive because additional surveillance requirements not in the CTS are included in the ITS.

M17 CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST for Functional Unit 5 (Intermediate Range, Neutron Flux) be performed prior to each reactor startup (S/U) if not performed in previous 31 days. ITS Table 3.3.1-1 for Functional Unit 4 (Intermediate Range Neutron Flux) requires a COT (SR 3.3.1.8) similarly prior to reactor startup but adds an additional periodicity for the COT of every 184 days thereafter. This changes the CTS by adding an additional surveillance frequency to the performance of the CHANNEL FUNCTIONAL TEST.

This change is acceptable because it continues to ensure the Intermediate Range Neutron Flux channels are OPERABLE in the MODES or other specified conditions in which the channels are assumed to function. This change is designated as more restrictive because the Surveillance must be performed every 184 days instead of only during a startup if not performed in previous 31 days.

M18 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 7 (Overtemperature ΔT) at a Frequency of at least once per 18 months. However, the CTS does not include a requirement to calibrate the excore channels to agree with the incore channels, which is needed to determine the f_1 (delta I) penalty. ITS Table 3.3.1-1 Function 6 (Overtemperature ΔT) requires the performance of ITS SR 3.3.1.6, calibrate excore channels to agree with incore detector measurements, for the Overtemperature ΔT channels. ITS SR 3.3.1.6 requires the calibration of excore channels to agree with incore detector measurements every 92 effective full power days (EFPD). ITS SR 3.3.1.6 is modified by a Note that states that the Surveillance is not required to be performed until 24 hours THERMAL POWER is ≥ 50% RTP. This changes the CTS by adding an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements.

The purpose of the excore to incore calibration is to ensure that the excore detectors are accurately measuring power. The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements every 18 months with a Note which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU. This change is acceptable because the proposed Surveillance is consistent with current plant practice and ensures the incore to excore detector calibration is performed periodically. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function. This change is designated as more restrictive because a new Surveillance with an explicit Frequency has been added to the Technical Specifications.

M19 CTS Table 4.3-1 Functional Units 18.A and 18.B specify the Surveillance Requirements for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions and do not include a CHANNEL CALIBRATION requirement. ITS Table 3.3.1-1 Functions 14.a and 14.b require a CHANNEL CALIBRATION (ITS SR 3.3.1.10) of these channels every 18 months. This changes the CTS by adding a CHANNEL CALIBRATION requirement for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions every 18 months. See DOC LA01 for discussion of moving Frequencies to the Surveillance Frequency Control Program (SFCP).

This change is acceptable because it ensures the channel output responds within the necessary range and accuracy to known values of the parameter that the channel monitors for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Trip Functions. The CHANNEL CALIBRATION Frequency (18 months) is consistent with the current refueling outage cycle. This change is designated as more restrictive because a new Surveillance Requirement has been added to the Turbine Trip Functions.

M20 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 2 (Power Range, Neutron Flux) by performance of a heat balance ((D(2)) at least once per 24 hours when above 15% RATED THERMAL POWER. ITS Table

3.3.1-1 requires a similar test for Function 2.a (Power Range Neutron Flux, High) ITS SR 3.3.1.2, performed on a Frequency of 24 hours that is modified by a Note stating, " Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. This changes the CTS by requiring the performance of the test within 12 hours of reaching or exceeding 15% RTP.

The purpose of the heat balance is to compare the calorimetric heat balance calculation to the power range channel output. 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. This Note adds a 12 hour restriction for performing the first Surveillance after reaching 15% RTP that CTS did not contain. This change is designated more restrictive because new requirements are being included in the ITS that are not required in the CTS.

M21 CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST for Functional Units 2 (Power Range Neutron Flux) and 5 (Intermediate Range Neutron Flux). ITS Table 3.3.1-1 requires a similar test, a COT (ITS SR 3.3.1.8), for Functions 2.b (Power Range Neutron Flux-Low), 4 (Intermediate Range Neutron Flux) and 5 (Source Range, Neutron Flux) adding a Note stating," This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions." This changes the CTS by adding an additional requirement to the test.

This test ensures that the Source Range Neutron Flux, Intermediate Range Neutron Flux, and Power Range Neutron Flux-Low functions are OPERABLE before taking the reactor critical. By verifying the interlocks are in the required state, confirmation is made that if a trip setting was exceeded these instruments would provide a reactor trip as designed. This change is designated as more restrictive because the ITS requires an additional acceptance criteria that is not currently required in the CTS.

M22 CTS 2.2.1 ACTION states, in part, that with a reactor trip system instrumentation or interlock setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable. ITS Table 3.3.1-1 Footnote (b) states, "If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service." ITS Bases Section 3.3-1 states, "The Allowable Value serves as the as-found Technical Specification OPERABILITY limit for the purpose of the COT." ITS Section 3.3.1 Bases also states, "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 nominal trip setpoint (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." This changes the CTS by requiring an evaluation of channel functionality (extent of which is expanded on in the TS Bases) prior to returning it to service in addition to the as-found value being conservative to the Allowable Value.

The purpose of this Note is to address a concern that the Technical Specification requirements for Limiting Safety System Settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will always actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. This change is consistent with TSTF-493 Option A. This change is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

M23 CTS 2.2.1 ACTION states, in part, to declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status "with its trip setpoint adjusted consistent with the Nominal Trip Setpoint value." ITS Table 3.3.1-1 Footnote (c) states, "The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The methodologies used to determine the as-found and as-left tolerances will be specified in UFSAR Section 7.1.2." This changes the CTS by providing more detailed information describing what "consistent with the Nominal Trip Setpoint" means and states a specific location where the methodology for determining these tolerance is located.

The purpose of this Note is to address a concern that the Technical Specification requirements for Limiting Safety System Settings (LSSS) may not be fully in compliance with the intent of 10 CFR 50.36. Specifically, the concern is that the existing Surveillance Requirements may not provide adequate assurance that instruments will always actuate safety functions at the point assumed in the applicable safety analysis. 10 CFR 50.36(c)(1)(ii)(A) states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the settings must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor." The proposed change clarifies the Technical Specification requirements to ensure that the automatic protective action will correct the abnormal situation before a safety limit is exceeded. This change is consistent with TSTF-493 Option A. This change is considered a more restrictive change because additional requirements have been added to Surveillance Requirements.

M24 CTS Table 2.2-1 for Functional Unit 16 (Underfrequency-Reactor Coolant Pumps) lists the Nominal Trip Setpoint as 56.0 Hz – each bus, and the Allowable Value as ≥ 55.9 Hz – each bus. ITS Table 3.3.1-1 for Function 12 (Underfrequency RCPs) lists the Nominal Trip Setpoint as 57.0 Hz and the Allowable Value as ≥ 56.3 Hz. This changes the CTS by increasing the Nominal Trip Setpoint and the Allowable Value for the Underfrequency RCP reactor trip.

The purpose of the Underfrequency RCP reactor trip is to ensure 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. TVA has determined that to provide adequate protection changes to the Underfrequency RCP Nominal Trip Setpoint and the Allowable Value are needed. This change was previously proposed in SQN license amendment request TVA-SQN-TS-02-01, Revision 1 (ADAMS Accession No. 042430467) but later withdrawn in TVA-SQN-TS-02-01, Revision 2 (ADAMS Accession No. ML061990303) pending resolution of issues with TSTF-493. In Revision 2 TVA stated that a new TS amendment request would be submitted to the NRC once TSTF-493 receives NRC approval. As TSTF-493 has been approved by the NRC and is being adopted under this conversion, TVA is proposing to change the setpoints to those proposed in the previous submittal. This change is acceptable because the revised Allowable Value and Nominal Trip Setpoint continue to provide assurance that the safety limit for the underfrequency reactor trip function is not impacted. In addition, this change ensures instrument uncertainties have been included in the as-found tolerance calculations in a manner that is acceptable and the surveillance Note requirements also ensure that there will be a reasonable expectation that these instruments will perform their safety function if required. This change is designated as more restrictive because more stringent acceptance requirements are being applied in the ITS than were applied in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* The proposed change removes all designated periodic Surveillance Frequencies from CTS 4.3.1.1.1, as addressed in CTS Table 4.3-1, CTS 4.3.1.1.2, and CTS 4.3.1.1.3, and places the Frequencies under licensee control in accordance with a new program, the Surveillance Frequency Control Program. ITS 3.3.1 Surveillance Requirements require similar Surveillances and, except for special or conditional frequencies stated in the individual surveillance, specifies the periodic Frequency as, "In accordance with the Surveillance Frequency

Control Program." This changes the CTS by moving designated specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 for RTS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.1-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

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

LA03 *(Type 1 - Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 Function 12 (Loss of Flow - Single Loop) and Function 13 (Loss of Flow - Two Loops) contain operational descriptions of how these Functions work. CTS Function 12 is interlocked with the Reactor Trip System Interlock P-8 (Power Range Neutron Flux) to provide a reactor trip with low flow in a single RCS loop when above a nominal 35% RTP. CTS Function 13 is interlocked with the Reactor Trip System Interlock P-7 and provides a reactor trip with low flow in two RCS loops when above a nominal 10% RTP.

However, these CTS Functions utilize the same flow instrumentation and flow setpoints. ITS does not include this information but describes these Functions interaction with the interlocks in the ITS bases and the ITS only specifies a single low flow Function that requires the affected instrument channels OPERABLE above the P-7 interlock. This changes the CTS by moving the description of the Function design and operation into the associated ITS bases.

The proposed change is acceptable because the information removed from the CTS Table 3.3-1 is not required in ITS to ensure the affected instrumentation is maintained OPERABLE. The ITS still requires the affected instrumentation to be OPERABLE in the applicable MODES or specifies the appropriate Action to be taken in a similar manner as before. The description of how this function is designed to operate above or below the associated interlock is not required in the ITS to ensure the appropriate instrumentation is maintained OPERABLE. Also, this change is acceptable since changes to the ITS Bases are controlled by the Technical Specification Bases Control. 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.

LA04 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS Table 3.3-1, including Note *, requires Functional Units 1 (Manual Reactor Trip), and 6 (Source Range Neutron Flux) channels to be OPERABLE "with the reactor trip system breakers in the closed position" and the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel. CTS Table 3.3-1 requires Functional Units 20 and 21 to be OPERABLE in MODES 3, 4, and 5 as modified by Note *. CTS Table 4.3-1 specifies the Surveillance Requirements for Functional Units 1, 6, 20, and 21 and includes a similar Note *. ITS Table 3.3.1-1, including Footnote (a), requires Functions 1 (Manual Reactor Trip), 5 (Source Range Neutron Flux), 17 (Reactor Trip Breakers), 18 (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms), and 19 (Automatic Trip Logic) channels to be OPERABLE in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or with one or more rods not fully inserted. This changes the CTS by moving the procedural details of placing the Rod Control System in a state capable of rod withdrawal (i.e., by using the reactor trip breakers) from the Technical Specifications to the Bases.

The removal of these details for performing actions 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 continues to specify requirements on the RTS depending on the status of the Rod Control System's capability to withdraw rods. 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.

LA05 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS Table 4.3-1 Notes (5), (9), and (11) contain information associated with testing of the Reactor Trip Breakers and Reactor Trip Bypass Breakers undervoltage and shut trip mechanisms. CTS Table 4.3-1 Note (5) states, in part, "The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits," and is applicable to the CHANNEL FUNCTIONAL TESTS for Functional Units 20 (Reactor Trip Breaker) and 21 (Automatic Trip Logic). CTS Table 4.3-1 Note (9) states, "The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the manual reactor trip function," and is applicable to the CHANNEL FUNCTIONAL TESTS for Functional Unit 1 (Manual Reactor Trip). CTS Table 4.3-1 Note (11) states, "Automatic and manual undervoltage trip," and is applicable to Functional Unit 23 (Reactor Trip Bypass Breaker. ITS 3.3.1 requires similar Surveillances (ITS SR 3.3.1.4 and SR 3.3.1.12) to be performed; however, the Surveillances do not include these quoted details. This changes the CTS by moving the details of the scope of the tests from the CTS to the Bases.

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 TADOT. 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 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 2.2-1 Functional Unit 12 (Loss of Flow) states the required percentage of design flow per loop and includes a footnote that states, "Design flow is 94,600 (91,400 X 1.035) gpm per loop." ITS Table 3.3.1-1 Function 10 (Reactor Coolant Flow – Low) 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. The Technical Specification Bases Control Program in Chapter 5 controls changes to the Bases. 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.

LA07 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 2.2-1 Functional Units 19 (Intermediate Range Neutron Flux - (P-6) Enable Block Source Range Reactor Trip), 20 (Power Range Neutron Flux (not P-10) Input to Low Power Reactor Trips Block P-7), 21 (Turbine Impulse Chamber Pressure - (P-13) Input to Low Power Reactor Trips Block P-7, 22 (Power Range Neutron Flux - (P-8) Low Reactor Coolant Loop Flow, and Reactor Trip, 23, Power Range Neutron Flux - (P-10) - Enable Block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips, and 25 (Power Range Neutron Flux - (P-9) - Blocks Reactor Trip for Turbine Trip Below 50% Rated Power) include a description of what the Functional Unit does. ITS Table 3.3.1-1 does not contain this description information in Functions 16.a (Intermediate Range Neutron Flux, P-6), 16.c (Power Range Neutron Flux, P-8), 16.d (Power Range Neutron Flux, P-9), 16.e (Power Range Neutron Flux, P-10), and 16.f (Turbine Impulse Pressure, P-13). This changes the CTS by removing the details of the system design to the Bases.

The removal of these details 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 adequate information to identify the Function. 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 related to system design is being removed from the Technical Specifications.

LA08 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 2.2-1 Notes 1 and 2 provide descriptions of some of the factors in the Allowable Value formulas for the Overtemperature ΔT and Overpower ΔT Functional Units, specifically the descriptions concerning the lead/lag and rate lag controllers for Tavg dynamic compensation. ITS Table 3.3-1 Notes 1 and 2 include the same Allowable Value formula, but do not include these specific factor descriptions. This changes the CTS by moving these factor descriptions to the UFSAR.

The removal of these details, which are related to system design from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Allowable Value formula for the Overtemperature ΔT and Overpower ΔT Functions. Also, this change is acceptable because the removed information will be adequately controlled in the UFSAR. Any changes to the UFSAR are made under 10 CFR 50.59 or 10 CFR 50.71(e), which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA09 *(Type 6 – Removal of Cycle – Specific Limits from the Technical Specifications to the Core Operating Limits Report)* CTS Table 2.2-1 for the Limiting Safety

System Settings states the formulas for Overtemperature ΔT and Overpower ΔT Functional Units. ITS 3.3.1 in Table 3.3.1-1 lists the formulas for the Overtemperature ΔT and Overpower ΔT Functions with a reference that certain variables/constants are contained in the CORE OPERATING LIMITS REPORT (COLR). This changes the CTS by relocating specific parameters for the Overtemperature ΔT and Overpower ΔT Functions, which must be confirmed on a cycle-specific basis, from the Technical Specifications to the COLR.

The removal of these cycle-specific parameter limits from the Technical Specifications and their relocation into the COLR is acceptable because these limits are developed or utilized under NRC-approved methodologies. The NRC documented in Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," that 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 requirements and Surveillances that verify that the cycle-specific parameter limits are being met. The functional requirements of the Overtemperature ΔT and Overpower ΔT Functions are retained in the Technical Specifications to ensure core protection. Also, this change is acceptable because the removed information will be adequately controlled in the COLR under the requirements provided in ITS 5.6.3, "CORE OPERATING LIMITS REPORT." ITS 5.6.3 ensures that the applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems limits, and nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analyses are met. This change is designated as a less restrictive removal of detail change because information relating to cycle-specific parameter limits is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-1 requires Functional Unit 5 (Intermediate Range Neutron Flux) channels to be OPERABLE with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor, as stated in CTS Table 3.3-1 Note *. ITS Table 3.3.1-1 does not include this Applicability for Function 4 (Intermediate Range Neutron Flux). This changes the CTS by deleting the requirements for OPERABILITY of the Intermediate Range Neutron Flux channels with the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

The purpose of CTS Table 3.3-1 Functional Unit 5 is to ensure the Intermediate Range Neutron Flux channels are OPERABLE. 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. 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. 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. In addition, the Source Range Neutron Flux channels are sufficient to mitigate any reactivity excursions in these conditions. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L02 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-1 Functional Units 9, 11, 12, 13, 16, and 17 specify the requirements for Pressurizer Pressure - Low, Pressurizer Water Level - High, Loss of Flow - Single Loop, Loss of Flow - Two Loops, Undervoltage - Reactor Coolant Pumps, and Underfrequency - Reactor Coolant Pumps. The Applicability of Functional Units 9 and 11 in CTS Table 3.3-1 is MODES 1 and 2, while the Applicability of Functional Units 12, 13, 16, and 17 in CTS Table 3.3-1 is MODE 1. ITS Table 3.3.1-1 Functions 8.a, 9, 10, 11, and 12, require the same Functions to be OPERABLE in MODE 1 above the P-7 interlock (Footnote (g)). This changes the CTS by limiting the Applicability of these Functional Units to MODE 1 above the P-7 interlock.

The purpose of CTS Table 3.3-1 Functional Units 9, 11, 12, 13, 16, and 17 is to open the reactor trip breakers whenever a condition monitored by these Functions reaches a preset level. To permit plant startup Functional Units 9, 11, 13, 16, and 17 trips are blocked below P-7 as safety analysis has shown operation within the limits of these trips below P-7 is not required to assure plant safety. In addition, to permit plant startup to continue above P-7 but below P-8, Functional Unit 13 trip is blocked below P-8 as safety analysis has shown operation within the limits of this trip below P-8 is not required to assure plant safety. Because the RCS flow instrumentation associated with Functional Units 12 and 13 are the same, inoperability of one channel affects both CTS Functional Units requiring a power operation to be limited to the most restrictive value, that of P-7. Therefore, although CTS Functional Unit 12 is blocked below P-8 the ACTIONS associated with CTS Functional Unit 13 must also be followed and ITS combines these Functional Units into Function 10 (Reactor Coolant Flow - Low) with an Applicability of MODE 1 above P-7 (footnote (g)). 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. In addition, this change is considered acceptable because the plant design below the P-7 interlock, defeats the automatic reactor trip on Pressurizer Pressure - Low, Pressurizer Water Level - High, Loss of Flow - Two Loops, Undervoltage - Reactor Coolant Pumps, and Underfrequency – Reactor Coolant Pumps and below the P-8 interlock, defeats the automatic reactor trip on Loss of Flow - Single Loop essentially rendering the trips inoperable. Therefore, the Applicability for these Functions is limited to when each Function provides protection. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L03 (*Category 2 – Relaxation of Applicability)* CTS Table 3.3-1 Functional Unit 22.A (Intermediate Range Neutron Flux, P-6) Applicable MODES column states "2, and *" where Note * states, "With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel". ITS Table 3.3.1-1, Function 16.a (Intermediate Range Neutron Flux, P-6), Applicable MODES or Other Specified Conditions column states "2$^{(f)}$," where Footnote (f) states, "Below the P-6 (Intermediate Range Neutron Flux) interlocks." This changes the CTS MODE of Applicability from MODE 2, with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor to MODE 2, below the P-6 (Intermediate Range Neutron Flux) interlocks.

The purpose of the P-6 interlock is to allow the manual block of the NIS Source Range Neutron Flux reactor trip on increasing power and then automatically enable the NIS Source Range Neutron Flux reactor trip on decreasing power. 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. CTS and ITS both require the P-6 interlock to be OPERABLE in MODE 2 under slightly different conditions. CTS modifies the MODE 2 Applicability by only requiring P-6 to be OPERABLE with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel; while ITS modifies the MODE 2 Applicability by only requiring OPERABILITY when below the P-6 interlocks. This is acceptable because 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. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L04 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 1, for Functional Unit 1 (Manual Reactor Trip) and ACTION 16, for Functional Units 20 (Reactor Trip Breakers) and 21 (Automatic Trip Logic) require, in part, the restoration of an inoperable channel within 48 hours or opening the reactor trip breakers. ITS LCO 3.3.1 ACTION C; for Functions 1 (Manual Reactor Trip), 17 (Reactor Trip Breakers), 18 (Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms), and 19 (Automatic Trip Logic); require the restoration of an inoperable channel or to initiate action to fully insert all rods in 49 hours and place the Rod Control System in a condition incapable of rod withdrawal. This changes the CTS by allowing alternatives to opening the reactor trip breakers to ensure the rods cannot be withdrawn.

The purpose of the CTS Action to open the reactor trip breakers is to assure the rods are maintained fully inserted and to reduce the potential for a reactivity event when an RTS Function is degraded. 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 ITS ACTION requires that the rod control system be placed in a condition where it is incapable of rod withdrawal. The ITS ACTION provides an equivalent level of assurance that the rods are maintained fully inserted and that the potential for a reactivity event is minimized. The CTS ACTION to open the reactor trip breakers is intended to prevent rod withdrawal. The ITS ACTION accomplishes the same thing by placing the rod control system in a condition where it is incapable of rod withdrawal. The ITS ACTION may consist of opening the reactor trip breakers or other Action to defeat the rod control system. In addition to accomplishing the intent of the CTS Action, the proposed change also conforms more closely to the revised Applicability for the affected RTS Functions. The ITS Applicability for the reactor trip breakers and automatic trip logic in MODES 3, 4, and 5 is "With the rod control system capable of rod withdrawal or one or more rods not fully inserted." The revised CTS Actions correspond to the ITS MODE of Applicability for these RTS Functions and ensure the plant is removed from the Applicable MODE if the restoration Action is not met. As such, the revised CTS ACTIONS do not introduce unacceptable risk or a condition that adversely affects the safe operation of the plant. The proposed change is designated as less restrictive because less stringent Required Actions are applied in the ITS than were applied in the CTS.

L05 *(Category 3 – Relaxation of Completion Time)* CTS Table 3.3-1 ACTION 2 for Unit 1 requires, in part, that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. CTS Table 3.3-1 ACTION 2 for Unit 1 is applicable to Unit 1 CTS Functional Units 2, Power Range, Neutron Flux; 3, Power Range, Neutron Flux High Positive Rate; 4, Power Range, Neutron Flux High Negative Rate. CTS Table 3.3-1 ACTION 2 for Unit 2 requires, in part, that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours (Note underlining to show Unit 1/Unit 2 difference). CTS Table 3.3-1 ACTION 2 for Unit 2 is applicable to Unit 2 CTS Functional Units 2, Power Range, Neutron Flux; 3, Power Range, Neutron Flux High Positive Rate; 4, Power Range, Neutron Flux High Negative Rate. CTS Table 3.3-1 ACTION 6 and ACTION 7 for Unit 1 and Unit 2 require, in part, that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. Table 3.3-1 ACTION 6 and ACTION 7 for Unit 1 and Unit 2 is applicable to CTS Functional Units; 7, Overtemperature ΔT Four Loop Operation; 8, Overpower ΔT Four Loop Operation; 9, Pressurizer Pressure-Low; 10, Pressurizer Pressure-High; 11, Pressurizer Water Level-High; 12, Loss of Flow - Single Loop (Above P-8); 13, Loss of Flow - Two Loops (Above P-7 and below P-8); 16, Undervoltage-Reactor Coolant Pump; 17, Underfrequency-Reactor Coolant Pumps; 18.A, Turbine Trip, Low Fluid Oil Pressure; and 18.B, Turbine Trip, Turbine Stop Valve Closure. ITS Required Actions D.1.1, D.2.1, E.1, K.1, and L.1, require placing the associated channel in trip with a Completion Time of 72 hours for 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; 6, Overtemperature ΔT; 7, Overpower ΔT; 8.a, Pressurizer Pressure, Low; 8.b, Pressurizer Pressure, High; 9, Pressurizer Water Level – High; 10, Reactor Coolant Flow – Low; 11, Undervoltage RCPs; 12, Underfrequency RCPs; 14.a, Turbine Trip, Low Fluid Oil Pressure; and 14.b, Turbine Trip, Turbine Stop Valve Closure. This changes the CTS by increasing the Completion Time for placing an inoperable channel in a tripped condition for these Functional Units from six (6) hours to 72 hours.

The purpose of CTS Table 3.3-1 ACTION 2.a and ACTION 6.a is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable, prior to being placed in a tripped state. 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. Additionally, this change is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L06 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 2, and ACTION 6 allow, in part, that with the number of OPERABLE channels one less than the Total Number of Channels and the Minimum Channels OPERABLE requirement met, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1. This action is applicable to CTS Functional Units 2, Power Range, Neutron Flux; 3, Power Range, Neutron Flux High Positive Rate; 4, Power Range, Neutron Flux High Negative Rate; 7, Overtemperature ΔT Four Loop Operation; 8, Overpower ΔT Four Loop Operation; 9, Pressurizer Pressure-Low; 10, Pressurizer Pressure-High; 11, Pressurizer Water Level-High; 12, Loss of Flow - Single Loop (Above P-8); 13, Loss of Flow - Two Loops (Above P-7 and below P-8); 16, Undervoltage-Reactor Coolant Pump; 17, Underfrequency-Reactor Coolant Pumps; and 18.A, Turbine Trip, Low Fluid Oil Pressure. ITS 3.3.1 ACTIONS D, E, K, and L, Required Actions are modified by a Note that states, "The inoperable channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment of other channels. This action is applicable to ITS Functional Units 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; 6, Overtemperature ΔT; 7, Overpower ΔT; 8.a, Pressurizer Pressure, Low; 8.b, Pressurizer Pressure, High; 9, Pressurizer Water Level – High 10, Reactor Coolant Flow – Low; 11, Undervoltage RCPs; 12, Underfrequency RCPs; 14.a, Turbine Trip, Low Fluid Oil Pressure; and 14.b, Turbine Trip, Turbine Stop Valve Closure. This changes the CTS by increasing the time allowed for these functions to be bypassed from 4 hours to 12 hours.

The purpose of CTS Table 3.3-1 ACTION 2 and ACTION 6 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable, prior to being placed in a tripped state. 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 proposed bypass time of 12 hours in ITS 3.3.1 ACTIONS D, E, K, and L is a sufficient time to perform train or channel surveillances. The 12 hour period is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed for an inoperable channel to be bypassed for maintenance than was allowed in the CTS.

L07 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1, ACTION 2 is applicable to Functional Units 2 (Power Range, Neutron Flux), 3 (Power Range Neutron Flux High Positive Rate), and 4 (Power Range Neutron Flux, High Negative Rate). With the number of OPERABLE channels, of any of these Functional Units, one less than the value listed in the Total Number of Channels column, ACTION 2 requires, in part, that the QUADRANT POWER TILT RATIO is monitored in accordance with CTS Technical Specification 3.2.4. ITS LCO 3.3.1, ACTION D, is applicable to Function 2.a (Power Range Neutron Flux, High). ITS LCO 3.3.1, Required Action D.2.2 provides a similar action stating, "Perform SR 3.2.4.2 (Verify QPTR is within limit using the movable incore detectors) but Required Action D.1.2 provides an alternative action to performing ITS SR 3.2.4.2 allowing for a power reduction to ≤ 75% RTP. This changes the CTS by added an alternative action to the ACTIONS allowing for a reduction in RTP instead of performance of QPTR verification.

The purpose of CTS Table 3.3-1 ACTION 2 to limit the maximum time allowed for maintenance activities, in which the channel is inoperable, prior to being placed in a tripped state. 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. CTS 4.2.4.2, one of the Surveillance Requirements associated with CTS 3.2.4, states, "The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75 percent of RATED THERMAL POWER with one Power Range Channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from the 4 pairs of symmetric thimble locations or from performance of a full core map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours." CTS Table 3.3-1, ACTION 2, directs the performance of this SR when a Power Range channel is inoperable. Similarly, ITS LCO 3.3.1, ACTION D, directs the performance of ITS SR 3.2.4.2, "Verify QPTR is within limit using the movable incore detectors," while providing an alternative action to reduce RTP to ≤ 75% RTP (Required Action D.1.2). Required Action D.1.2 simply takes the stipulation presented in CTS SR 4.2.4.2 (when above 75 percent of RATED THERMAL POWER) and duplicates this allowance in ITS LCO 3.3.1, ACTION D. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

L08 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 2, applicable to Functional Units 2 (Power Range, Neutron Flux), 3 (Power Range, Neutron Flux High Positive Rate), and 4 (Power Range, Neutron Flux, High Negative Rate), requires, in part, performance of CTS 4.2.4.2 (QPTR verification) with any of the applicable Functional Units number of OPERABLE channels one less than the value listed in the Total Number of Channels column. ITS LCO 3.3.1, Required Action D.2.2, applicable to Function 2.a (Power Range Neutron Flux, High) requires performance of ITS SR 3.2.4.2 (QPTR Verification) when one channel is inoperable but is modified by a Note stating, "Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable." This changes the CTS by limiting the requirement to verify QPTR to when the Power Range Neutron Flux input to QPTR is inoperable.

The purpose of CTS Table 3.3-1 ACTION 2 (QPTR verification by incore detectors) is to verify gross radial power distribution remains consistent with the design values used in the safety analyses. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable power range channel and allows continued unit operation at power levels > 75% RTP. Failure of a component in the Power Range Neutron Flux Channel may not affect the capability to monitor QPTR. As such, determining QPTR using movable incore detectors once per 12 hours may not be necessary. 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 features. This includes the capacity and capability of remaining features, a reasonable time for repairs or replacement, and the low probability of a DBA 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.

L09 *(Category 4 – Relaxation of Required Action)* With one Intermediate Range Neutron Flux channel inoperable, CTS Table 3.3-1 ACTION 3.b requires, when above the P-6 interlock and below 5% of RTP, the restoration of the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% RTP. ITS 3.3.1 ACTION F, which provides the actions when one Intermediate Range Neutron Flux channel is inoperable, provides two optional Required Actions. Required Action F.1 requires the reduction of THERMAL POWER to < P-6 within 24 hours, while Required Action F.2 requires the increase of THERMAL POWER to > P-10 within 24 hours. Refer to DOC M06 for discussion of limiting operation > 5% RTP and < P-10 to 24 hours. This changes the CTS by allowing the unit to change power level to exit the MODE of Applicability instead of requiring the restoration of the equipment.

The purpose of CTS Table 3.3-1 ACTION 3.b is to ensure the appropriate actions are taken when an Intermediate Range Neutron Flux channel is inoperable. 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 DBA occurring during the repair period. The Intermediate 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 repair period. The Intermediate Range Neutron Flux channels are required to mitigate events within the proposed Applicability of above the P-6 interlock and below the P-10 interlock. While the unit is within the Applicability of the LCO, the other Intermediate Range Neutron Flux channel can perform the required safety function. With the unit outside the proposed Applicability of the equipment, the equipment is not credited in any transient, other instrumentation is available to mitigate the consequences of a transient event. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L10 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-1, ACTION 7 for Functional Unit 18.B (Turbine Trip, Turbine Stop Valve Closure) states, "With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours." ITS ACTION L for Function 14.b (Turbine Trip, Turbine Stop Valve Closure) provides similar actions but adds 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 Turbine Trip, Turbine Stop Valve Closure channel to be bypassed up to 12 hours to perform surveillance testing of other channels.

The purpose of CTS Table 3.3-1, ACTION 7 is to allow some time to restore the inoperable channel prior to placing the channel in a tripped condition or requiring a unit shutdown. The Required Actions Note allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 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.

L11 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 10 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP. This action is applicable to CTS Functional Unit 14.C (Main Steam Generator Water Level—Low-Low, RCS Loop ΔT). ITS 3.3.1 Required Action T.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

The purpose of CTS Table 3.3-1 ACTION 10 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection sets Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. This change is considered less restrictive because an addition required action is added to the CTS that provides acceptable protection when a channel is inoperable.

L12 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 11 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Functional Unit 14.D (Main Steam Generator Water Level—Low-Low, Containment Pressure (EAM)). ITS 3.3.1 Required Action S.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

The purpose of CTS Table 3.3-1 ACTION 11 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level -- Low-Low level channels in the tripped condition. Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. This change is considered less restrictive because an additional required action is added to the CTS that provides acceptable protection when a channel is inoperable.

L13 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-1, ACTION 12 for Functional Units 19 (Safety Injection Input from ESF), 20.A (Reactor Trip Breakers, Startup and Power Operation), and 21.A (Automatic Trip Logic, Startup and Power Operation) states, "With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE." ITS LCO 3.3.1, ACTION M for Functions 15 (Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS) and 19 (Automatic Trip Logic); and ACTION N for Function 17 (Reactor Trip Breakers) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours for an inoperable Safety Injection Input from ESF train, Reactor Trip Breaker train, or an Automatic Trip Logic train, plus increasing the allowed time a train can be bypassed for surveillance testing from 2 hours to 4 hours.

The purpose of CTS Table 3.3-1, ACTION 12 is to allow some time to restore the inoperable train before requiring a unit shutdown. ITS LCO 3.3.1 ACTION M allows 24 hours to restore the train to an OPERABLE status and the Required Actions Note allows placing one train in the bypassed condition for up to 4 hours while performing routine surveillance testing provided the other train is OPERABLE. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L14 *(Category 7 – Relaxation of Surveillance Frequency)* The CTS surveillance requirements specified In Table 4.3-1 for Functional Unit 2 (Power Range, Neutron Flux) include a CHANNEL CALIBRATION performed every quarter. The surveillance is modified by Note 6 that excludes the neutron detectors. ITS Function 2.a (Power Range Neutron Flux, High) and Function 2.b (Power Range Neutron Flux, Low) require a CHANNEL CALIBRATION (SR 3.3.1.11) to be performed every 18 months. ITS SR 3.3.1.11 also contains a note that excludes the neutron detectors from the test. This changes the CTS by reducing the frequency of the required CHANNEL CALIBRATION from quarterly to once per 18 months.

The existing surveillance requirements for the Power Range nuclear instrumentation (NIS) include a daily adjustment by calorimetric heat balance calculation, a 31 effective full power day (EFPD) comparison of incore to excore axial flux difference, a quarterly CHANNEL FUNCTIONAL TEST (CFT), and a quarterly CHANNEL CALIBRATION. The CTS CFT defined term in Section 1.0 of the CTS does not require setpoints to be verified during performance of the test. The new ITS CHANNEL OPERATIONAL TEST (COT) that replaces the CTS CFT explicitly requires that setpoints be verified. The COT is required to be performed every 184 days on the Power Range NIS channels. Therefore, the channel setpoints are required to be verified on a 184 day basis. The significant difference between a CHANNEL CALIBRATION and a COT is that the CHANNEL CALIBRATION includes the instrument channel sensors. As the sensors (neutron detectors) are not included in the CTS CHANNEL CALIBRATION requirement, the new COT effectively accomplishes the same function as the CTS CHANNEL CALIBRATION requirement.

The proposed change is acceptable considering the number and frequency of surveillances that are performed on the NIS (daily, monthly, semi-annually) and the fact that the new ITS COT definition specifically requires setpoints to be verified. Considering that the new COT requirement is effectively the same as the CTS CHANNEL CALIBRATION requirement, (changes to the COT frequency from quarterly to 184 days are discussed in DOC L15) the proposed change does not significantly reduce the surveillance testing performed on the Power Range NIS. In addition, the CHANNEL CALIBRATION requirement is normally required on an 18 month interval for all other RTS and ESFAS instrument channels and has been proven to provide adequate assurance of instrument OPERABILITY when performed on this interval for all other RTS and ESFAS instrumentation. As such, the proposed change continues to provide adequate assurance that the Power Range NIS channels are appropriately calibrated and maintained OPERABLE consistent with the requirements for the other RTS and ESFAS instrument channels. The proposed change is designated less restrictive because less stringent surveillance requirements are applied in the ITS than in the CTS.

L15 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST on a monthly basis (M) for Functional Unit 6 (Source Range , Neutron Flux). CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST on a quarterly basis (Q) for Functional Units 2 (Power Range, Neutron Flux), 3 (Power Range, Neutron Flux, High Positive Rate), 4 (Power Range, Neutron Flux, High Negative Rate), 7 (Overtemperature Delta T), 8 (Overpower Delta T), 9 (Pressurizer Pressure—Low), 10 (Pressurizer Pressure—High), 11 (Pressurizer Water Level—High), 12 (Loss of Flow - Single Loop), 14.A (Steam Generator Water Level-- Low-Low (Adverse)), 14.B (Steam Generator Water Level-- Low-Low (EAM)), 14.C (RCS Loop ΔT), and 14.D (Containment Pressure (EAM). 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), 6 (Overtemperature ΔT), 7 (Overpower ΔT), 8.a (Pressurizer Pressure – Low), 8.b (Pressurizer Pressure – High), 9 (Pressurizer Water Level – High), 10 (Reactor Coolant Flow – Low), 13.a (Steam Generator (SG) Water Level – Low Low (Adverse)), 13.b (Steam Generator (SG) Water Level – Low Low (EAM)), 13.a (Containment Pressure (EAM)), and 13.a/13.b (RCS Loop ΔT) requires performance of a COT (ITS SR 3.3.1.7 or SR 3.3.1.8) every 184 days. This changes the CTS by changing the frequency of the Surveillances from monthly and quarterly to 184 days.

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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA 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 Enclosure 4 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.

L16 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST on a monthly basis (M) and prior to each reactor startup for Functional Unit 20 (Reactor Trip Breaker) and on a monthly basis (M) for Functional Unit 23 (Reactor Trip Bypass Breaker). A Note (Note 5 for Functional Unit 20 and Note 10 for Functional Unit 23) that, in part, states, "Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS," modifies the monthly CHANNEL FUNCTIONAL TEST for each of these Functional Units. The monthly CHANNEL FUNCTIONAL TEST in combination with the modifying Note requires testing each reactor trip breaker and reactor trip bypass breaker every two months. In addition, another Note (Note 1 for Functional Unit 20) modifies the "Prior to each reactor Startup" Frequency by stating, "If not performed in previous 31 days." ITS Table 3.3.1-1 Function 17 (Reactor Trip Breakers) requires performance of a TADOT (ITS SR 3.3.1.4) every 62 days on a STAGGERED TEST BASIS. A footnote modifies ITS Table 3.3.1-1 Function 17, Footnote (i), stating, "Including any reactor trip bypass breakers that are racked in and closed for bypassing a reactor trip breaker." This changes the CTS by changing the Frequency of the Surveillances from monthly on a STAGGERED TEST BASIS for the reactor trip breakers and reactor trip bypass breakers and prior to each reactor startup if not performed in the previous 31 day for the reactor trip breakers; to every 62 days on a STAGGERED TEST BASIS for the reactor trip breakers and reactor trip bypass breakers when racked in and closed for bypassing a reactor trip breaker.

The purpose of the CHANNEL FUNCTIONAL TEST/COT is to ensure that the instrumentation is functioning properly. An important concept in this change is that the definition of STAGGERED TEST BASIS (STB) in CTS is not the same as in ITS. In CTS STAGGERED TEST BASIS is defined as, "A STAGGERED TEST BASIS shall consist of: a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval. For example; for Functional Unit 20 (Reactor Trip Breaker) a CHANNEL FUNCTIONAL TEST is required monthly as modified by Note 5 stating, "Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS." Using the CTS STB definition there are two (2) reactor trip breaker trains with the Note 5 frequency of 62 days on a STB, 62 days/2 trains = 31 days/train (or monthly), Table 4.3-1 frequency. Therefore, in CTS, each month (31 days) a reactor trip breaker is tested, e.g., month 1 – reactor trip breaker A, month 2 – reactor trip breaker B, month 3 – RTB A, Month 4 – reactor trip breaker B, etc. So monthly a reactor trip breaker is tested, and each reactor trip breaker is tested every two (2) months (62 days). In ITS, STB is defined as, "A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function." Using the ITS definition for the ITS SR 3.3.1.4 Frequency of "62 days on a STAGGERED TEST BASIS," changes the testing of each reactor trip breaker to every 4 months (124 days). The ITS STB definition requires a reactor trip breaker to be tested every 62 days. Because there are two (2) reactor trip breakers and the STB definition states that all designated components are tested during *n* Surveillance Frequency intervals where *n* is the number of designated components, 62 days x 2 components = 124 days (or every 4 months or quarterly). Therefore, this change decreases the frequency for testing of each reactor trip breaker and Reactor Trip Bypass Breaker from every two months to every 4 months with the interaction between trains controlled by the STB definition and removes the conditional requirement. 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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA 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 Enclosure 4 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.

L17 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST on a monthly basis (M) for Functional Unit 21

(Automatic Trip Logic). A Note (Note 5 for Functional Unit 21) that, in part, states, "Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS," modifies the monthly CHANNEL FUNCTIONAL TEST for this Functional Unit. The monthly CHANNEL FUNCTIONAL TEST in combination with the modifying Note requires testing each Automatic Trip Logic train every two months. ITS Table 3.3.1-1 Function 19 (Automatic Trip Logic) requires performance of an ACTUATION LOGIC TEST (ITS SR 3.3.1.5) every 92 days on a STAGGERED TEST BASIS. This changes the CTS by changing the Frequency of the Surveillance from monthly on a STAGGERED TEST BASIS for the Automatic Trip Logic to every 92 days on a STAGGERED TEST BASIS.

The purpose of the ACTUATION LOGIC TEST is to ensure that when various simulated or actual input combinations in conjunction with each possible interlock logic state required for OPERABILITY of a logic circuit are applied the required logic output is obtained. An important concept in this change is that the definition of STAGGERED TEST BASIS (STB) in CTS is not the same as in ITS. In CTS STAGGERED TEST BASIS is defined as, "A STAGGERED TEST BASIS shall consist of: a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval. Using the CTS STB definition there are two (2) Automatic Trip Logic trains with the Note 5 Frequency of 62 days on a STB, 62 days/2 trains = 31 days/train (or monthly), Table 4.3-1 frequency. Therefore, in CTS, each month (31 days) an Automatic Trip Logic train is tested and each Automatic Trip Logic train is tested every two (2) months (62 days). In ITS, STB is defined as, "A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function." Using the ITS definition for the ITS SR 3.3.1.5 Frequency of "92 days on a STAGGERED TEST BASIS," changes the testing of each Automatic Trip Logic train to every 6 months (184 days). The ITS STB definition requires an Automatic Trip Logic Function to be tested every 92 days. Because there are two (2) Automatic Trip Logic trains and the STB definition states that all designated trains are tested during *n* Surveillance Frequency Intervals where *n* is the number of trains, 92 days x 2 components = 184 days (or every 6 months). Therefore, this change decreases the Frequency for testing of each Automatic Trip Logic train from every two months to every 6 months with the interaction between trains controlled by the STB definition. 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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA 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 Enclosure 4 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.

L18 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table 4.3-1 requires performance of a CHANNEL FUNCTIONAL TEST for Functions 5 (Intermediate Range, Neutron Flux) and 6 (Source Range, Neutron Flux) prior to each reactor startup (S/U) if not performed in previous 31 days (Note (1)). ITS Table 3.3.1-1 requires performance of a CHANNEL OPERATIONAL TEST (COT), SR 3.3.1.8, for Functions 4 (Intermediate Range Neutron Flux) and 5 (Source Range Neutron Flux) prior to reactor startup if not performed in the previous 184 days. This changes the CTS by extending the requirement to perform the test from "if not performed within the previous 31 days" to "if not performed within the previous 184 days."

The purpose of the CHANNEL FUNCTIONAL TEST/COT is to ensure the instrumentation is functioning properly. The Surveillance Frequency allows for a period between testing where assurance that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met for that period has been found acceptable. SQN CTS initially required performance of CHANNEL FUNCTIONAL TESTS for the nuclear instrument monthly. During a normal cycle, the unit is in MODE 1 for a period in excess of 31 days and the Surveillance is not performed nor required; the plant is not in the Functions' MODE of Applicability and the Functions are blocked. If a plant shutdown were to occur and the Function had been tested within the periodicity of the surveillance there was no need to perform the surveillance again to provide the necessary assurance the Function would perform as required thus the Note relaxing the performance requirement if previously performed within its normal frequency. Because of changes approved in 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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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) the Surveillance Frequency for these channels was extended to 184 days. Therefore, this change is acceptable because extending the allowance for excluding performance of this surveillance on reactor startup if performed within the previous 184 days provides the necessary assurance the function will perform as required. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L19 *(Category 5 – Deletion of Surveillance Requirement)* CTS Table 4.3-1 Note (5), applies to the CHANNEL FUNCTIONAL TEST for Functional Unit 21 (Automatic Trip Logic). Note (5), in part, states, "The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits." ITS SR 3.3.1.5 requires an ACTUATION LOGIC TEST and applies to Function 19 (Automatic Trip Logic) but does not contain the requirement for independent verification of the OPERABILITY of the undervoltage and automatic shunt trip circuits. This changes the CTS by deleting the verification of the undervoltage and automatic shunt trip circuits from the Automatic Trip Logic ACTUATION LOGIC TEST.

The purpose of this part of CTS Table 4.3-1, Note (5) is to ensure each diverse trip mechanism is tested to prevent a reduction in the reliability of the reactor trip system. 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 at a frequency necessary to give confidence that the equipment can perform its assumed safety function. TVA added this requirement for independent testing of the reactor trip breaker undervoltage and shunt trip circuits in response to NRC Generic Letter 85-09, "Technical Specifications for Generic Letter 83-28, Item 4.3," (GL 85-09). This change is acceptable because it is consistent with GL 85-09 and the reactor trip breaker test will continue to include separate verification of the undervoltage and shunt trip mechanisms under ITS SR 3.3.1.4. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L20 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1, in part, requires a FUNCTIONAL TEST for Functional Unit 6 (Source Range, Neutron Flux) in MODES 2, 3, 4, 5, and with the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. When in the required MODES, the FUNCTIONAL TEST is required to be performed on a monthly basis (M) and prior to startup (S/U) if not performed in the previous 31 days (Note (1)). ITS Table 3.3.1-1 requires a CHANNEL OPERATIONAL TEST (COT) for Function 5 (Source Range Neutron Flux) in MODE 2 below the P-6 interlocks; and MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. The COT required to be performed in MODES 3, 4, or 5 is ITS SR 3.3.1.7 (MODE 2 is discussed in DOC M16). ITS SR 3.3.1.7 is modified by a note stating, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 24 hours after entry into MODE 3." This changes the CTS by allowing for a delay in performance of the surveillance.

The purpose of the CTS FUNCTIONAL TEST for the Source Range Neutron Flux Function is to ensure the entire channel will perform the intended Function. This change is acceptable because the delay in surveillance performance is similar to that allowed under SR 3.0.3 when it is determined a surveillance has been missed. The function of the Source Range Neutron flux trip is to backup the Power Range Neutron Flux-Low Setpoint Reactor Trip, providing protection against an uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition. The addition of the 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 reactor trip breakers 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 reactor trip breakers closed for greater than 24 hours this Surveillance must be performed prior to 24 hours after entry into MODE 3. This change is designated as less restrictive because a Surveillance will be performed less frequently under the ITS than under the CTS.

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

3.3 INSTRUMENTATION

3.3.1~~A~~ Reactor Trip System (RTS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

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

Applicability 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
ACTION	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
ACTION 1	B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours
		<u>OR</u>	
		B.2 Be in MODE 3.	54 hours
ACTIONS 1, 16	C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
		<u>OR</u>	
DOC L04		C.2.1 Initiate action to fully insert all rods.	48 hours
		<u>AND</u>	

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.1A ①

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L04		C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours	
ACTION 2	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. ---		③
		~~----------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.~~ ~~---~~]~~		④ ③
ACTION 2.a		D.1.1 Place channel in trip. AND	72 hours	
DOC L07		D.1.2 Reduce THERMAL POWER to ≤ 75% RTP. OR	78 hours	
ACTION 2.a		D.2.1 Place channel in trip. AND	72 hours	

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 2.c DOC L08		D.2.2 --------------NOTE-------------- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. -------------------------------------		
ACTION 2.c		Perform SR 3.2.4.2.	Once per 12 hours	
		OR		
DOC M05		D.3 Be in MODE 3.	78 hours	
ACTIONS 2, 6 ACTION 2.b ACTION 6.b	E. One channel inoperable.	[------------------NOTE------------------ The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		③
		~~----------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.~~ ~~---~~]		④ ③
ACTION 2.a ACTION 6.a		E.1 Place channel in trip.	72 hours	
		OR		
DOC M05		E.2 Be in MODE 3.	78 hours	
ACTION 3 DOC L09	F. One Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6.	24 hours	
		OR		

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC M06		F.2 Increase THERMAL POWER to > P-10.	24 hours
DOC M07	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
ACTION 4 DOC M08	H. One Source Range Neutron Flux channel inoperable.	H.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
DOC M09	I. Two Source Range Neutron Flux channels inoperable.	I.1 Open reactor trip breakers ~~(RTBs)~~.	Immediately ②

①

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION 4	J. One Source Range Neutron Flux channel inoperable.	J.1 Restore channel to OPERABLE status.	48 hours
		OR	
DOC M08		J.2.1 Initiate action to fully insert all rods.	48 hours
		AND	
DOC M08		J.2.2. Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours
ACTION 6 ACTION 6.b	K. One channel inoperable.	~~[~~ -------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. -- ③ ~~----------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.~~ ~~---]~~ ④ ③	
ACTION 6.a		K.1 Place channel in trip.	72 hours
		OR	
DOC M10		K.2 Reduce THERMAL POWER to < P-7.	78 hours

ACTIONS (continued)

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

②

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTIONS 6, 7 DOC L10 ACTION 6.b	~~N~~ L. One Turbine Trip 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.~~ ~~---]~~		② ③ ④ ③
ACTION 6.a, 7		~~N~~ L.1 Place channel in trip.	72 hours	②
		OR		
DOC M11		~~N~~ L.2 Reduce THERMAL POWER to < ~~[~~P-9~~]~~.	76 hours	② ③
ACTION 12 DOC L13	~~O~~ M. One train inoperable.	------------------NOTE------------------ One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. ---		② ③
DOC L13		~~O~~ M.1 Restore train to OPERABLE status.	24 hours	②
		OR		
ACTION 12		~~O~~ M.2 Be in MODE 3.	30 hours	②

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 12	~~P~~ N. One ~~RTB~~ reactor trip breaker train inoperable.	--------------------NOTE------------------ One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ---		②
DOC L13		~~P~~ N.1 Restore train to OPERABLE status.	~~[~~24~~]~~ hours	② ③
		<u>OR</u>		
ACTION 12		~~P~~ N.2 Be in MODE 3.	~~[~~30~~]~~ hours	② ③
ACTION 8 DOC M12	~~Q~~ O. One or more channels inoperable.	~~Q~~ O.1 Verify interlock is in required state for existing unit conditions.	1 hour	②
		<u>OR</u>		
		~~Q~~ O.2 Be in MODE 3.	7 hours	②
ACTION 8 DOC M12	~~R~~ P. One or more channels inoperable.	~~R~~ P.1 Verify interlock is in required state for existing unit conditions.	1 hour	②
		<u>OR</u>		
		~~R~~ P.2 Be in MODE 2.	7 hours	②
ACTION 15	~~S~~ Q. One trip mechanism inoperable for one ~~RTB~~ reactor trip breaker.	INSERT 1 ~~S~~ Q.1 Restore inoperable trip mechanism to OPERABLE status.	48 hours	② ②
		<u>OR</u>		
DOC A16		~~S~~ Q.2 Be in MODE 3.	54 hours	②

INSERT 2
INSERT 3 ⑤

②

INSERT 1

Table 3.3-1
ACTION 15

--------------------NOTE------------------
The reactor trip breaker train shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status
----

⑤

INSERT 2

ACTION 9 ACTION 9c	R. One channel inoperable.	-------------------NOTE------------------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --	
ACTION 9b		R.1 For the affected protection set, adjust the Trip Time Delay for one affected steam generator (T_S) to match the Trip Time Delay for multiple affected steam generators (T_M).	4 hours
		<u>AND</u>	
ACTION 9a		R.2 Place channel in trip.	6 hours
ACTION 11	S. One channel inoperable.	S.1 For the affected protection set, adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level - Low-Low (Adverse).	6 hours
		<u>OR</u>	
DOC L12		S.2 For the affected protection set, place the Steam Generator Water level--Low-Low channel(s) in trip	6 hours
		<u>OR</u>	
DOC M15		S.3 Be in MODE 3.	12 hours

⑤

INSERT 3

	CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION 10	T. One channel inoperable.	T.1	For the affected protection set, adjust the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP.	6 hours
		<u>OR</u>		
DOC L11		T.2	For the affected protection set, place the Steam Generator Water Level--Low-Low channel(s) in trip.	6 hours
		<u>OR</u>		
DOC M14		T.3	Be in MODE 3.	12 hours
DOC M13	U. Required Action and associated Completion Time of Condition R not met.	U.1	Be in MODE 3.	6 hours

CTS

SURVEILLANCE REQUIREMENTS

4.3.1.1.1

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

CTS	SURVEILLANCE		FREQUENCY	
Table 4.3-1 Functions 2, 5-14	SR 3.3.1.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
Table 4.3-1 Function 2, including Note (2) DOC M20	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~~ absolute difference is > 2%.	~~[24 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ⑥ ② ⑥

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
Table 4.3-1 Function 2, including Note (3)	SR 3.3.1.3	------------------------------NOTE------------------------------ Not required to be performed until ~~[24]~~ 96 hours after THERMAL POWER is ≥ ~~[~~15~~]~~% RTP. --		③
		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)~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
Table 4.3-1 Function 20, including Note (5) Function 23, including Note (10)	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.	~~[62 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.3.1.1.2 Function 22.B Table 4.3-1 Function 21 including Note (5)	SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
DOC M18	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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ⑥ ⑥
DOC L20 Table 4.3-1 Functions 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, and 14,	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~~ 24 hours after entry into MODE 3. --- Perform COT.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑥ ⑥

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M21	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. ---		
Table 4.3-1 Functions 5 and 6 Table 4.3-1 Note (1)		Perform COT.	--------NOTE-------- Only required when not performed within ~~[~~the Frequency specified in the Surveillance Frequency Control Program ~~or previous 184 days]~~ ------------------------	⑥ ⑥
			Prior to reactor startup	
			AND	
DOC M16			Four hours after reducing power below P-6 for source range instrumentation	
			AND	
DOC M16			~~[~~Twelve~~]~~ hours after reducing power below P-10 for power and intermediate range instrumentation	③
			AND	

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
		~~[Every 184 days thereafter~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
SR 3.3.1.9 DOC A20 Table 4.3-1 Functions 16 and 17	-----------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[92] days~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
SR 3.3.1.10 DOC A19 Table 4.3-1 Functions 7, 8, 9, 10, 11, 12, 13, 14.A, 14.B,14C, 14.D, 16, 17, 18.A, 18B, and 22.E	-----------------------------NOTE------------------------------ This Surveillance shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

CTS

SURVEILLANCE REQUIREMENTS (continued)

Table 4.3-1 Note (6)

Table 4.3-1 Functions 2, 3, 4, 5, 6, 22.A, 22.C 22.D, and 22.F

SURVEILLANCE		FREQUENCY
SR 3.3.1.11	-----------------------------NOTE----------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
~~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.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑦
~~SR 3.3.1.13~~	~~Perform COT.~~	~~[18 months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑧

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC A20 Table 4.3-1 Functions 1, 22.A, 22.C, 22.D, 22.E, and 22.F	SR 3.3.1.~~14~~ 12	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑨ ⑥ ⑥
DOC A20 Table 4.3-1 , Functions 18.A and 18.B, including Note (1) and Note (12)	SR 3.3.1.~~15~~ 13	------------------------------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	⑨ ③

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
4.3.1.1.3	SR 3.3.1.~~16~~ 14 ⑨ -----NOTE----- Neutron detectors are excluded from response time testing. ----- Verify RTS RESPONSE TIME is within limits.	~~[[18] months on a STAGGERED TEST BASIS~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

Table 3.3-1
Table 4.3-1
Table 2.2-1

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(f)}$~~ TRIP SETPOINT~~]~~	③
1	1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.~~14~~ 12	NA	NA	⑨
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	C	SR 3.3.1.~~14~~ 12	NA	NA	⑨
	2. Power Range Neutron Flux							
2	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[111.2]~~ 111.4% RTP	~~[~~109~~]~~% RTP	③ ⑨
2	b. Low	$1^{(d)}$,2	4	E	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[27.2]~~ 27.4% RTP	~~[~~25~~]~~% RTP	③ ⑨
	3. Power Range Neutron Flux Rate							
3	a. High Positive Rate	1,2	4	E	SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$	≤ ~~[6.8]~~ 6.3% RTP with time constant ≥ ~~[~~2~~]~~ sec	~~[~~5~~]~~% RTP with time constant ≥ ~~[~~2~~]~~ sec	③
4	b. High Negative Rate	1,2	4	E	SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[6.8]~~ 6.3% RTP with time constant ≥ ~~[~~2~~]~~ sec	~~[~~5~~]~~% RTP with time constant ≥ ~~[~~2~~]~~ sec	⑨

Note * (a) With Rod Control System capable of rod withdrawal or one or more rods not fully insert ed. ⑫

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC A06 (d) Below the P-10 (Power Range Neutron Flux) interlocks.

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-1
Table 4.3-1
Table 2.2-1

Table 3.3.1-1 (page 2 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL$^{~~(l)~~}$ TRIP SETPOINT~~]~~	③
5	4. Intermediate Range Neutron Flux	$1^{(d)}$, $2^{(e)}$	2	F,G	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$	≤ ~~[31]~~ 45.20 % RTP	~~[~~25~~]~~% RTP	③
6.A	5. Source Range Neutron Flux	$2^{(f)}$	2	H,I	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ ~~SR 3.3.1.16~~	≤ ~~[1.4 E5]~~ 1.45 x 10^5 cps	~~[1.0 E5]~~ 10^5 cps	③ ⑪
6.A		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	I,J	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ ~~SR 3.3.1.16~~	≤ ~~[1.4 E5]~~ 1.45 x 10^5 cps	~~[1.0 E5]~~ 10^5 cps	③ ⑪
7	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$^{(b)(c)}$ SR 3.3.1.~~12~~ 10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	Refer to Note 1 (Page 3.3.1-~~19~~ 23)	Refer to Note 1 (Page 3.3.1-~~19~~ 23)	③ ⑫ ⑦ ⑨
8	7. Overpower ΔT	1,2	~~[~~4~~]~~	E	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.~~12~~ 10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	Refer to Note 2 (Page 3.3.1-~~20~~ 24)	Refer to Note 2 (Page 3.3.1-~~20~~ 24)	③ ⑦ ⑫ ⑨

Note * (a) With Rod Control System capable of rod withdrawal or one or more rods not fully insert ed. ⑫

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC A06 (d) Below the P-10 (Power Range Neutron Flux) interlocks.

DOC A07 (e) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

Note ##
Note (6) (f) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

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

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

~~-----~~

Table 3.3-1
Table 4.3-1
Table 2.2-1 (unless otherwise noted)

Table 3.3.1-1 (page 3 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~	③
	8. Pressurizer Pressure							
9	a. Low	1(~~h~~ (g))	~~[~~4~~]~~	K	SR 3.3.1.1 SR 3.3.1.7(b)(c) SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≥ ~~[1886]~~ 1964.8 psig	~~[1900]~~ 1970 psig	⑬ ③ ⑨
10	b. High	1,2	~~[~~4~~]~~	E	SR 3.3.1.1 SR 3.3.1.7(b)(c) SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≤ ~~[2396]~~ 2390.2 psig	~~[~~2385~~]~~ psig	③ ⑨
11	9. Pressurizer Water Level - High	1(g)	3	K	SR 3.3.1.1 SR 3.3.1.7(b)(c) SR 3.3.1.10(b)(c)	≤ ~~[93.8]~~ 92.7%	~~[~~92~~]~~%	③
12 13	10. Reactor Coolant Flow - Low	1(g)	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7(b)(c) SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≥ ~~[89.2]~~ 89.6%	~~[~~90~~]~~%	③ ⑨
	~~11. Reactor Coolant Pump (RCP) Breaker Position~~							②
	~~a. Single Loop~~	~~1(h)~~	~~1 per RCP~~	~~L~~	~~SR 3.3.1.14~~	~~NA~~	~~NA~~	
	~~b. Two Loops~~	~~1(i)~~	~~1 per RCP~~	~~M~~	~~SR 3.3.1.14~~	~~NA~~	~~NA~~	
16 Table 2.2-1 Function 15	~~12~~ 11. Undervoltage RCPs	1(g)	~~[3]~~ 1 per bus	K	SR 3.3.1.9 SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≥ ~~[4760]~~ 4739 V	~~[4830]~~ 5022 V	② ③ ⑨

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC L02 (g) Above the P-7 (Low Power Reactor Trips Block) interlock.

~~(h) Above the P-8 (Power Range Neutron Flux) interlock.~~ ②

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

~~REVIEWER'S NOTE~~ ④

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

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.1~~A~~ ①

Table 3.3-1
Table 4.3-1

Table 3.3.1-1 (page 4 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~	③
17 Table 2.2-1 Function 16	~~13~~ 12. Underfrequency RCPs	1(g)	~~[3]~~ 1 per bus	K	SR 3.3.1.9 SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≥ ~~[57.1]~~ 56.3 Hz	~~[57.5]~~ 57.0 Hz	② ③ ⑨
14 Table 2.2-1 Function 13	~~14~~ 13. Steam Generator (SG) Water Level ~~- Low Low~~ INSERT 4	~~1,2~~	~~[4 per SG]~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≥ [30.4]%~~	~~[32.3]%~~	⑭ ②
	INSERT 5 ~~15. SG Water Level - Low~~	~~1,2~~	~~2 per SG~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≥ [30.4]%~~	~~[32.3]%~~	
	~~Coincident with Steam Flow/Feedwater Flow Mismatch~~	~~1,2~~	~~2 per SG~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≤ [42.5]% full steam flow at RTP~~	~~[40]% full steam flow at RTP~~	
18 Table 2.2-1 Function 17	~~16~~ 14. Turbine Trip							②
	a. Low Fluid Oil Pressure	1(~~i~~ h)	3	~~N~~ L	SR 3.3.1.10(b)(c) SR 3.3.1.~~15~~ 13	≥ ~~[750]~~ 39.5 psig	~~[800]~~ 45 psig	② ③
	b. Turbine Stop Valve Closure	1(~~i~~ h)	4	~~N~~ L	SR 3.3.1.10 SR 3.3.1.~~15~~ 13	≥ ~~[~~1~~]~~% open	~~[~~1~~]~~% open	② ③ ②
19 Table 2.2-1 Function 18	~~17~~ 15. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	~~O~~ M	SR 3.3.1.~~14~~ 12	NA	NA	②

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC L02 (g) Above the P-7 (Low Power Reactor Trips Block) interlock.

Note ** (~~i~~ h) Above the P-9 (Power Range Neutron Flux) interlock. ②

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

⑭

INSERT 4

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-1, 14.A Table 4.3-1, 14.A Table 2,2-1, 13.a Table 2,2-1, 13.b	a. Low-Low (Adverse)	1,2	3 per SG	R	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≥ 14.4% NR Span	15.0% NR Span
Table 3.3-1, 14.D Table 4.3-1, 14.D Table 2.2-1, 13.a Table 2.2-1, 13.b	Coincident with Containment Pressure (EAM)	1,2	4	S	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≤ 0.6 psig	0.5 psig
Table 3.3-1, 14.C Table 4.3-1, 14.C Table 2.2-1, 13.a Table 2,2-1, 13.b	and RCS Loop ΔT	1,2	4	T	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 2.2-1 13.a	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3)	T_S (Note 3)
Table 2.2-1 13.a	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3)	T_m (Note 3)

⑭

INSERT 5

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-1, 14.B Table 4.3-1, 14.B Table 2.2-1, 13.a Table 2,2-1, 13.b	b. Low-Low (EAM)	1,2	3 per SG	R	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≥ 10.1% NR Span	10.7% NR Span
Table 3.3-1, 14.C Table 4.3-1, 14.C Table 2.2-1, 13.a Table 2,2-1, 13.b	Coincident with RCS Loop ΔT	1,2	4	T	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 2.2-1 13.a	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3)	T_S (Note 3)
Table 2.2-1 13.a	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3)	T_m (Note 3)

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.1~~A~~ ①

Table 3.3-1
Table 4.3-1

Table 3.3.1-1 (page 5 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL$^{(l)}$ TRIP SETPOINT~~]~~	③
22	16 ~~18~~. Reactor Trip System Interlocks							②
22.A Table 2.2-1 Function 19	a. Intermediate Range Neutron Flux, P-6	$2^{(f)}$	2	O ~~Q~~	SR 3.3.1.11 ~~SR 3.3.1.13~~	≥ 6 x 10^{-5}% RTP ~~[6E-11] amp~~	1 x 10^{-4}% RTP ~~[1E-10] amp~~	② ③
22.B	b. Low Power Reactor Trips Block, P-7	1	1 per train	P ~~R~~	SR 3.3.1.5	NA	NA	②
22.C Table 2.2-1 Function 22	c. Power Range Neutron Flux, P-8	1	4	P ~~R~~	SR 3.3.1.11 ~~SR 3.3.1.13~~	≤ 37.4 ~~[50.2]~~% RTP	35 ~~[48]~~% RTP	② ③
22.F Table 2.2-1 Function 25	d. Power Range Neutron Flux, P-9	1	4	P ~~R~~	SR 3.3.1.11 ~~SR 3.3.1.13~~	≤ 52.4 ~~[52.2]~~% RTP	~~[~~50~~]~~% RTP	② ③
22.D Table 2.2-1 Function 20 and 23	e. Power Range Neutron Flux, P-10	1,2	4	O ~~Q~~	SR 3.3.1.11 ~~SR 3.3.1.13~~	≥ 7.6 ~~[7.8]~~% RTP and ≤ 12.4 ~~[12.2]~~% RTP	~~[~~10~~]~~% RTP	② ③
22.E Table 2.2-1 Function 21	f. Turbine Impulse Pressure, P-13	1	2	P ~~R~~	~~[SR 3.3.1.1]~~ SR 3.3.1.10 ~~SR 3.3.1.13~~	≤ 12.4 ~~[12.2]~~% turbine power	~~[~~10~~]~~% turbine power	② ③ ②
20	17 ~~19~~. Reactor Trip Breakers$^{(i)}$ ~~(k)~~ ~~(RTBs)~~	1,2	2 trains	N ~~P~~	SR 3.3.1.4	NA	NA	②
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2 trains	C	SR 3.3.1.4	NA	NA	

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

Note ## (f) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

DOC A09 (i ~~k~~) Including any reactor trip bypass breakers that are racked in and closed for bypassing a~~n~~ reactor trip breaker ~~RTB~~. ②

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-1
Table 4.3-1 T

Table 3.3.1-1 (page 6 of 8)
Reactor Trip System Instrumentation

③

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~	
20	~~20~~ 18. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per ~~RTB~~ reactor trip breaker	~~S~~ Q	SR 3.3.1.4	NA	NA	②
		$3^{(a)}, 4^{(a)}, 5^{(a)}$	1 each per ~~RTB~~ reactor trip breaker	C	SR 3.3.1.4	NA	NA	②
21	~~21~~ 19. Automatic Trip Logic	1,2	2 trains	~~O~~ M	SR 3.3.1.5	NA	NA	②
		$3^{(a)}, 4^{(a)}, 5^{(a)}$	2 trains	C	SR 3.3.1.5	NA	NA	

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

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 2.2-1

Table 3.3.1-1 (page 7 of 8)
Reactor Trip System Instrumentation

Note 1

Note 1: Overtemperature ΔT

Note 3

The Overtemperature ΔT Function Allowable Value shall not exceed the following ~~[~~Nominal Trip Setpoint~~]~~ by more than ~~[3.8]~~ 1.9 % of ΔT span. ③

INSERT 6

~~$\Delta T \frac{(1+T_1S)}{(1+T_2S)}\left(\frac{1}{1+T_3S}\right) \leq \Delta T_Q \left\{K_1 - K_2 \frac{(1+T_4S)}{(1+T_5S)}\left[T \frac{1}{(1+T_6S)} - T'\right] + K_3(P-P') - f_1(\Delta I)\right\}$~~ ②

Where: ΔT is measured RCS ΔT,°F.

$\Delta T_{\cancel{Q}}$ 0 is the indicated ΔT at RTP,°F. ②

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. ③

P is the measured pressurizer pressure, psig

P' is the nominal RCS operating pressure, ~~≥~~ = ~~[~~*~~]~~ psig ② ③

K_1 ≤ ~~[~~*~~]~~ K_2 ≥ ~~[~~*~~]~~/°F K_3 ~~≥~~ = ~~[~~*~~]~~/psig ② ③

τ

~~T~~ $_1$ ≥ ~~[~~*~~]~~ sec ~~T~~ $_2$ ≤ ~~[~~*~~]~~ sec ~~T_3 ≤ [*] sec~~

~~T~~ $_4$ ≥ ~~[~~*~~]~~ sec ~~T~~ $_5$ ≤ ~~[~~*~~]~~ sec ~~T_6 ≤ [*] sec~~

INSERT 7 ②

~~$f_1(\Delta I)$ = [*] {[*] - (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. ②

* (including QTNL, QTPL, QTNS, and QTPS)

②

INSERT 6

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0\left\{K_1 - K_2\left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)\left[T - T'\right] + K_3(P - P') - f_1(\Delta I)\right\}$$

②

INSERT 7

and f_1 (ΔI) is a function such that:

(i) for q_t - q_b between QTNL* and QTPL* f_1 (ΔI) = 0

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QTPL*, the ΔT nominal trip setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

Table 2.2-1

Table 3.3.1-1 (page 8 of 8)
Reactor Trip System Instrumentation

Note 2

Note 2: Overpower ΔT

Note 4

The Overpower ΔT Function Allowable Value shall not exceed the following ~~[~~Nominal Trip Setpoint~~]~~ by more than ~~[3]~~ 1.7 % of ΔT span. ③

INSERT 8

~~$\Delta T \frac{(1+T_1S)}{(1+T_2S)}\left(\frac{1}{1+T_3S}\right) \le \Delta T_Q \left\{K_4 \quad K_5 \frac{T_7S}{1+T_7S}\left(\frac{1}{1+T_6S}\right)T \quad K_6\left[T \frac{1}{1+T_6S} \quad T''\right] \quad f_2(\Delta I)\right\}$~~ ②

Where: ΔT is measured RCS ΔT,°F.

ΔT~~$_Q$~~ 0 is the indicated ΔT at RTP,°F. ②

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. ③

K_4 ≤ ~~[~~*~~]~~

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

K_6 ≥ ~~[~~*~~]~~/°F when T > T''
~~[~~*~~]~~/°F when T ≤ T'' ③

τ ~~T_1~~ 3 ≥ ~~[~~*~~]~~ sec

~~T_6 ≤ [*] sec~~

τ ~~T_2~~ 4 ≤ ~~[~~*~~]~~ sec

~~T_7 ≥ [*] sec~~

τ ~~T_3~~ 5 ~~≤~~ ≥ ~~[~~*~~]~~ sec ②

~~$f_2(\Delta I)$ = [*]~~ INSERT 9

INSERT 10

These values denoted with ~~[~~~~]~~ * (including QPNL, QPPL, QPNS, and QPPS) are specified in the COLR. ②

Note 5

INSERT 11

②

INSERT 8

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \le \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right)T - K_6\left(T - T''\right) - f_2(\Delta I)\right\}$$

②

INSERT 9

and f_2 (ΔI) is a function such that:

(i) for q_t - q_b between QPNL* and QPPL* f_2 (ΔI) = 0

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QPNL*, the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QPPL*, the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

②

INSERT 10

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.

②

INSERT 11

Note 3: Trip Time Delay - Steam Generator Water Level -- Low-Low

T_s = $\{(-0.00583)(P)^3 + (0.735)(P)^2 - (33.560)(P) + 649.5\}$ 0.99 secs.

T_m = $\{(-0.00532)(P)^3 + (0.678)(P)^2 - (31.340)(P) + 589.5\}$ 0.99 secs.

Where:

P = RCS Loop ΔT Equivalent to Power (% RTP), $P \leq 50\%$ RTP

T_s = Time delay for Steam Generator Water level -- Low-Low Reactor Trip, one Steam Generator affected. (Secs.)

T_m = Time delay for Steam Generator Water Level -- Low-Low Reactor Trip, two or more Steam Generators affected. (Secs.)

3.3 INSTRUMENTATION

3.3.1~~A~~ Reactor Trip System (RTS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

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

Applicability 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
ACTION	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
ACTION 1	B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours
		<u>OR</u>	
		B.2 Be in MODE 3.	54 hours
ACTIONS 1, 16	C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
		<u>OR</u>	
DOC L04		C.2.1 Initiate action to fully insert all rods.	48 hours
		<u>AND</u>	

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L04		C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours	
ACTION 2	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. ---		③
		~~----------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.~~		④
		~~--]~~		③
ACTION 2.a		D.1.1 Place channel in trip.	72 hours	
		AND		
DOC L07		D.1.2 Reduce THERMAL POWER to ≤ 75% RTP.	78 hours	
		OR		
ACTION 2.a		D.2.1 Place channel in trip.	72 hours	
		AND		

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 2.c DOC L08		D.2.2 --------------NOTE-------------- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable. -------------------------------------		
ACTION 2.c		Perform SR 3.2.4.2.	Once per 12 hours	
		OR		
DOC M05		D.3 Be in MODE 3.	78 hours	
ACTIONS 2, 6 ACTION 2.b ACTION 6.b	E. One channel inoperable.	~~[~~ -------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. --		③
		~~----------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.~~ ~~--]~~		④ ③
ACTION 2.a ACTION 6.a		E.1 Place channel in trip.	72 hours	
		OR		
DOC M05		E.2 Be in MODE 3.	78 hours	
ACTION 3 DOC L09	F. One Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6.	24 hours	
		OR		

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
DOC M06		F.2	Increase THERMAL POWER to > P-10.	24 hours
DOC M07	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
		<u>AND</u>		
		G.2	Reduce THERMAL POWER to < P-6.	2 hours
ACTION 4 DOC M08	H. One Source Range Neutron Flux channel inoperable.	H.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
DOC M09	I. Two Source Range Neutron Flux channels inoperable.	I.1	Open reactor trip breakers ~~(RTBs)~~.	Immediately ②

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 4	J. One Source Range Neutron Flux channel inoperable.	J.1 Restore channel to OPERABLE status.	48 hours	
		<u>OR</u>		
DOC M08		J.2.1 Initiate action to fully insert all rods.	48 hours	
		<u>AND</u>		
DOC M08		J.2.2. Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours	
ACTION 6 ACTION 6.b	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.~~ ~~---]~~		③ ④ ③
ACTION 6.a		K.1 Place channel in trip.	72 hours	
		<u>OR</u>		
DOC M10		K.2 Reduce THERMAL POWER to < P-7.	78 hours	

ACTIONS (continued)

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

②

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTIONS 6, 7 DOC L10 ACTION 6.b	L ~~N~~. One Turbine Trip 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.~~ ~~--~~ ~~]~~		② ③ ④ ③
ACTION 6.a, 7		L ~~N~~.1 Place channel in trip.	72 hours	②
		OR		
DOC M11		L ~~N~~.2 Reduce THERMAL POWER to < ~~[~~P-9~~]~~.	76 hours	② ③
ACTION 12 DOC L13	M ~~O~~. One train inoperable.	-------------------NOTE------------------- One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. ---		② ③
DOC L13		M ~~O~~.1 Restore train to OPERABLE status.	24 hours	②
		OR		
ACTION 12		M ~~O~~.2 Be in MODE 3.	30 hours	②

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 12	~~P~~ N. One ~~RTB~~ reactor trip breaker train inoperable.	--------------------NOTE------------------ One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. ---		②
DOC L13		~~P~~ N.1 Restore train to OPERABLE status.	~~[~~24~~]~~ hours	② ③
		<u>OR</u>		
ACTION 12		~~P~~ N.2 Be in MODE 3.	~~[~~30~~]~~ hours	② ③
ACTION 8 DOC M12	~~Q~~ O. One or more channels inoperable.	~~Q~~ O.1 Verify interlock is in required state for existing unit conditions.	1 hour	②
		<u>OR</u>		
		~~Q~~ O.2 Be in MODE 3.	7 hours	②
ACTION 8 DOC M12	~~R~~ P. One or more channels inoperable.	~~R~~ P.1 Verify interlock is in required state for existing unit conditions.	1 hour	②
		<u>OR</u>		
		~~R~~ P.2 Be in MODE 2.	7 hours	②
ACTION 15	~~S~~ Q. One trip mechanism inoperable for one ~~RTB~~ reactor trip breaker.	INSERT 1 ~~S~~ Q.1 Restore inoperable trip mechanism to OPERABLE status.	48 hours	② ②
		<u>OR</u>		
DOC A16		~~S~~ Q.2 Be in MODE 3.	54 hours	②

INSERT 2

INSERT 3 ⑤

②

INSERT 1

Table 3.3-1
ACTION 15

--------------------NOTE------------------
The reactor trip breaker train shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status
----

⑤

INSERT 2

ACTION 9 ACTION 9c	R. One channel inoperable.	-------------------NOTE------------------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --	
ACTION 9b		R.1 For the affected protection set, adjust the Trip Time Delay for one affected steam generator (T_S) to match the Trip Time Delay for multiple affected steam generators (T_M).	4 hours
		<u>AND</u>	
ACTION 9a		R.2 Place channel in trip.	6 hours
ACTION 11	S. One channel inoperable.	S.1 For the affected protection set, adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level - Low-Low (Adverse).	6 hours
		<u>OR</u>	
DOC L12		S.2 For the affected protection set, place the Steam Generator Water level--Low-Low channel(s) in trip	6 hours
		<u>OR</u>	
DOC M15		S.3 Be in MODE 3.	12 hours

⑤

INSERT 3

	CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION 10	T. One channel inoperable.	T.1	For the affected protection set, adjust the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP.	6 hours
		<u>OR</u>		
DOC L11		T.2	For the affected protection set, place the Steam Generator Water Level--Low-Low channel(s) in trip.	6 hours
		<u>OR</u>		
DOC M14		T.3	Be in MODE 3.	12 hours
DOC M13	U. Required Action and associated Completion Time of Condition R not met.	U.1	Be in MODE 3.	6 hours

CTS

SURVEILLANCE REQUIREMENTS

4.3.1.1.1
---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

	SURVEILLANCE	FREQUENCY	
Table 4.3-1 Functions 2, 5-14	SR 3.3.1.1 Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
Table 4.3-1 Function 2, including Note (2) DOC M20	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~~ absolute difference is > 2%.	~~[24 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ⑥ ② ⑥

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
Table 4.3-1 Function 2, including Note (3)	SR 3.3.1.3	-----------------------------NOTE----------------------------- Not required to be performed until ~~[24]~~ 96 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)~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ⑥ ⑥
Table 4.3-1 Function 20, including Note (5) Function 23, including Note (10)	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.	~~[62 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
4.3.1.1.2 Function 22.B Table 4.3-1 Function 21 including Note (5)	SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
DOC M18	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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	③ ⑥ ⑥
DOC L20 Table 4.3-1 Functions 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, and 14,	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~~ 24 hours after entry into MODE 3. --- Perform COT.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑥ ⑥

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY
DOC M21	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. --	
Table 4.3-1 Functions 5 and 6 Table 4.3-1 Note (1) DOC M16 DOC M16		Perform COT.	--------NOTE-------- Only required when not performed within ~~[~~ the Frequency specified in the Surveillance Frequency Control Program ~~or previous 184 days]~~ ⑥ ⑥ ------------------------ 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 ③ AND

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
			~~[Every 184 days thereafter~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
DOC A20 Table 4.3-1 Functions 16 and 17	SR 3.3.1.9	-----------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[92] days~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
DOC A19 Table 4.3-1 Functions 7, 8, 9, 10, 11, 12, 13, 14.A, 14.B,14C, 14.D, 16, 17, 18.A, 18B, and 22.E	SR 3.3.1.10	-----------------------------NOTE------------------------------ This Surveillance shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

CTS

SURVEILLANCE REQUIREMENTS (continued)

Table 4.3-1
Note (6)

Table 4.3-1
Functions 2, 3, 4, 5, 6, 22.A, 22.C 22.D, and 22.F

SURVEILLANCE		FREQUENCY
SR 3.3.1.11	------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
~~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.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑦
~~SR 3.3.1.13~~	~~Perform COT.~~	~~[18 months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑧

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
DOC A20 Table 4.3-1 Functions 1, 22.A, 22.C, 22.D, 22.E, and 22.F	SR 3.3.1.~~14~~ 12 ------------------------------NOTE------------------------------ Verification of setpoint is not required. -- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑨ ⑥ ⑥
DOC A20 Table 4.3-1 , Functions 18.A and 18.B, including Note (1) and Note (12)	SR 3.3.1.~~15~~ 13 ------------------------------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	⑨ ③

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
4.3.1.1.3 SR 3.3.1.~~16~~ 14	------------------------------NOTE------------------------------ Neutron detectors are excluded from response time testing. --- Verify RTS RESPONSE TIME is within limits.	⑨ ~~[[18] months on a STAGGERED TEST BASIS~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program] ⑥

Table 3.3-1
Table 4.3-1
Table 2.2-1

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~	③
1	1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.~~14~~ 12	NA	NA	⑨
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	C	SR 3.3.1.~~14~~ 12	NA	NA	⑨
	2. Power Range Neutron Flux							
2	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[111.2]~~ 111.4% RTP	~~[~~109~~]~~% RTP	③ ⑨
2	b. Low	$1^{(d)}$,2	4	E	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[27.2]~~ 27.4% RTP	~~[~~25~~]~~% RTP	③ ⑨
	3. Power Range Neutron Flux Rate							
3	a. High Positive Rate	1,2	4	E	SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$	≤ ~~[6.8]~~ 6.3% RTP with time constant ≥ ~~[~~2~~]~~ sec	~~[~~5~~]~~% RTP with time constant ≥ ~~[~~2~~]~~ sec	③
4	b. High Negative Rate	1,2	4	E	SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[6.8]~~ 6.3% RTP with time constant ≥ ~~[~~2~~]~~ sec	~~[~~5~~]~~% RTP with time constant ≥ ~~[~~2~~]~~ sec	⑨

Note * (a) With Rod Control System capable of rod withdrawal or one or more rods not fully insert ed. ⑫

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC A06 (d) Below the P-10 (Power Range Neutron Flux) interlocks.

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

CTS

Table 3.3-1
Table 4.3-1
Table 2.2-1

Table 3.3.1-1 (page 2 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(l)}$~~ TRIP SETPOINT~~]~~	③
5	4. Intermediate Range Neutron Flux	$1^{(d)}$, $2^{(e)}$	2	F,G	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$	≤ ~~[31]~~ 45.20% RTP	~~[~~25~~]~~% RTP	③
6.A	5. Source Range Neutron Flux	$2^{(f)}$	2	H,I	SR 3.3.1.1 SR 3.3.1.8$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ ~~SR 3.3.1.16~~	≤ ~~[1.4 E5]~~ 1.45 x 10^5 cps	~~[1.0 E5]~~ 10^5 cps	③ ⑪
6.A		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2	I,J	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.11$^{(b)(c)}$ ~~SR 3.3.1.16~~	≤ ~~[1.4 E5]~~ 1.45 x 10^5 cps	~~[1.0 E5]~~ 10^5 cps	③ ⑪
7	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$^{(b)(c)}$ SR 3.3.1.~~12~~ 10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	Refer to Note 1 (Page 3.3.1-~~19~~ 23)	Refer to Note 1 (Page 3.3.1-~~19~~ 23)	③ ⑫ ⑦ ⑨
8	7. Overpower ΔT	1,2	~~[~~4~~]~~	E	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.~~12~~ 10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	Refer to Note 2 (Page 3.3.1-~~20~~ 24)	Refer to Note 2 (Page 3.3.1-~~20~~ 24)	③ ⑦ ⑫ ⑨

Note * (a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted. ⑫

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC A06 (d) Below the P-10 (Power Range Neutron Flux) interlocks.

DOC A07 (e) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

Note ##
Note (6) (f) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

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

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

~~----------~~

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.1~~A~~ ①

Table 3.3-1
Table 4.3-1
Table 2.2-1 (unless otherwise noted)

Table 3.3.1-1 (page 3 of 8)
Reactor Trip System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL$^{(l)}$ TRIP SETPOINT~~]~~	
								③
	8. Pressurizer Pressure							
9	a. Low	1$^{(~~f~~)}$ (g)	~~[~~4~~]~~	K	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≥ ~~[1886]~~ 1964.8 psig	~~[1900]~~ 1970 psig	⑬ ③ ⑨
10	b. High	1,2	~~[~~4~~]~~	E	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≤ ~~[2396]~~ 2390.2 psig	~~[~~2385~~]~~ psig	③ ⑨
11	9. Pressurizer Water Level - High	1$^{(g)}$	3	K	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$	≤ ~~[93.8]~~ 92.7%	~~[~~92~~]~~%	③
12 13	10. Reactor Coolant Flow - Low	1$^{(g)}$	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≥ ~~[89.2]~~ 89.6%	~~[~~90~~]~~%	③ ⑨
	~~11. Reactor Coolant Pump (RCP) Breaker Position~~							②
	~~a. Single Loop~~	~~1$^{(h)}$~~	~~1 per RCP~~	~~L~~	~~SR 3.3.1.14~~	~~NA~~	~~NA~~	
	~~b. Two Loops~~	~~1$^{(i)}$~~	~~1 per RCP~~	~~M~~	~~SR 3.3.1.14~~	~~NA~~	~~NA~~	
16 Table 2.2-1 Function 15	~~12~~ 11. Undervoltage RCPs	1$^{(g)}$	~~[3]~~ 1 per bus	K	SR 3.3.1.9 SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.~~16~~ 14	≥ ~~[4760]~~ 4739 V	~~[4830]~~ 5022 V	② ③ ⑨

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC L02 (g) Above the P-7 (Low Power Reactor Trips Block) interlock.

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

~~(i) Above the P-7 (Low Power Reactor Trips Block) interlock and below the P-8 (Power Range Neutron Flux) interlock.~~ ②

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

CTS

Table 3.3-1
Table 4.3-1

Table 3.3.1-1 (page 4 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~	③
17 Table 2.2-1 Function 16	~~13~~ 12. Underfrequency RCPs	1(g)	~~[3]~~ 1 per bus	K	SR 3.3.1.9 SR 3.3.1.10(b)(c) SR 3.3.1.~~16~~ 14	≥ ~~[57.1]~~ 56.3 Hz	~~[57.5]~~ 57.0 Hz	② ③ ⑨
14 Table 2.2-1 Function 13	~~14~~ 13. Steam Generator (SG) Water Level ~~- Low Low~~ INSERT 4	~~1,2~~	~~[4 per SG]~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≥ [30.4]%~~	~~[32.3]%~~	⑭ ②
	INSERT 5 ~~15. SG Water Level - Low~~	~~1,2~~	~~2 per SG~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≥ [30.4]%~~	~~[32.3]%~~	
	~~Coincident with Steam Flow/Feedwater Flow Mismatch~~	~~1,2~~	~~2 per SG~~	~~E~~	~~SR 3.3.1.1~~ ~~SR 3.3.1.7(b)(c)~~ ~~SR 3.3.1.10(b)(c)~~ ~~SR 3.3.1.16~~	~~≤ [42.5]% full steam flow at RTP~~	~~[40]% full steam flow at RTP~~	
18 Table 2.2-1 Function 17	~~16~~ 14. Turbine Trip							②
	a. Low Fluid Oil Pressure	1(~~f~~ h)	3	~~N~~ L	SR 3.3.1.10(b)(c) SR 3.3.1.~~15~~ 13	≥ ~~[750]~~ 39.5 psig	~~[800]~~ 45 psig	② ③
	b. Turbine Stop Valve Closure	1(~~f~~ h)	4	~~N~~ L	SR 3.3.1.10 SR 3.3.1.~~15~~ 13	≥ ~~[~~1~~]~~% open	~~[~~1~~]~~% open	② ③ ②
19 Table 2.2-1 Function 18	~~17~~ 15. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	~~O~~ M	SR 3.3.1.~~14~~ 12	NA	NA	②

DOC M22 (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

DOC M23 (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ⑩ ③

DOC L02 (g) Above the P-7 (Low Power Reactor Trips Block) interlock.

Note ** (~~f~~ h) Above the P-9 (Power Range Neutron Flux) interlock. ②

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

⑭

INSERT 4

CTS		FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-1, 14.A Table 4.3-1, 14.A Table 2,2-1, 13.a Table 2,2-1, 13.b	a.	Low-Low (Adverse)	1,2	3 per SG	R	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≥ 14.4% NR Span	15.0% NR Span
Table 3.3-1, 14.D Table 4.3-1, 14.D Table 2.2-1, 13.a Table 2.2-1, 13.b		Coincident with Containment Pressure (EAM)	1,2	4	S	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≤ 0.6 psig	0.5 psig
Table 3.3-1, 14.C Table 4.3-1, 14.C Table 2.2-1, 13.a Table 2,2-1, 13.b		and RCS Loop ΔT	1,2	4	T	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 2.2-1 13.a		with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3)	T_S (Note 3)
Table 2.2-1 13.a		or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3)	T_m (Note 3)

⑭

INSERT 5

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-1, 14.B Table 4.3-1, 14.B Table 2.2-1, 13.a Table 2,2-1, 13.b	b. Low-Low (EAM)	1,2	3 per SG	R	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	≥ 10.1% NR Span	10.7% NR Span
Table 3.3-1, 14.C Table 4.3-1, 14.C Table 2.2-1, 13.a Table 2,2-1, 13.b	Coincident with RCS Loop ΔT	1,2	4	T	SR 3.3.1.1 SR 3.3.1.7$^{(b)(c)}$ SR 3.3.1.10$^{(b)(c)}$ SR 3.3.1.14	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 2.2-1 13.a	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3)	T_S (Note 3)
Table 2.2-1 13.a	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3)	T_m (Note 3)

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.1~~A~~

Table 3.3-1
Table 4.3-1

Table 3.3.1-1 (page 5 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(l)}$~~ TRIP SETPOINT~~]~~	③
22	16 ~~18~~. Reactor Trip System Interlocks							②
22.A Table 2.2-1 Function 19	a. Intermediate Range Neutron Flux, P-6	2$^{(f)}$	2	~~Q~~ O	SR 3.3.1.11 ~~SR 3.3.1.13~~	≥ ~~[6E-11] amp~~ 6 x 10^{-5}% RTP	~~[1E-10] amp~~ 1 x 10^{-4}% RTP	② ③
22.B	b. Low Power Reactor Trips Block, P-7	1	1 per train	~~R~~ P	SR 3.3.1.5	NA	NA	②
22.C Table 2.2-1 Function 22	c. Power Range Neutron Flux, P-8	1	4	~~R~~ P	SR 3.3.1.11 ~~SR 3.3.1.13~~	≤ ~~[50.2]~~ 37.4% RTP	~~[48]~~ 35% RTP	② ③
22.F Table 2.2-1 Function 25	d. Power Range Neutron Flux, P-9	1	4	~~R~~ P	SR 3.3.1.11 ~~SR 3.3.1.13~~	≤ ~~[52.2]~~ 52.4% RTP	~~[~~50~~]~~% RTP	② ③
22.D Table 2.2-1 Function 20 and 23	e. Power Range Neutron Flux, P-10	1,2	4	~~Q~~ O	SR 3.3.1.11 ~~SR 3.3.1.13~~	≥ ~~[7.8]~~ 7.6% RTP and ≤ ~~[12.2]~~ 12.4% RTP	~~[~~10~~]~~% RTP	② ③
22.E Table 2.2-1 Function 21	f. Turbine Impulse Pressure, P-13	1	2	~~R~~ P	~~[SR 3.3.1.1]~~ SR 3.3.1.10 ~~SR 3.3.1.13~~	≤ ~~[12.2]~~ 12.4% turbine power	~~[~~10~~]~~% turbine power	② ③ ②
20	17 ~~19~~. Reactor Trip Breakers$^{(~~k~~)}$ i ~~(RTBs)~~	1,2	2 trains	~~P~~ N	SR 3.3.1.4	NA	NA	②
		3$^{(a)}$, 4$^{(a)}$, 5$^{(a)}$	2 trains	C	SR 3.3.1.4	NA	NA	

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

Note ## (f) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

DOC A09 (~~k~~ i) Including any reactor trip bypass breakers that are racked in and closed for bypassing a~~n~~ ~~RTB~~ reactor trip breaker. ②

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

CTS

RTS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.1~~A~~

Table 3.3-1
Table 4.3-1 T

Table 3.3.1-1 (page 6 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~ ③
20	18 ~~20~~. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per ~~RTB~~ reactor trip breaker	~~S~~ Q	SR 3.3.1.4	NA	NA ②
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	1 each per ~~RTB~~ reactor trip breaker	C	SR 3.3.1.4	NA	NA ②
21	19 ~~21~~. Automatic Trip Logic	1,2	2 trains	~~O~~ M	SR 3.3.1.5	NA	NA ②
		$3^{(a)}$, $4^{(a)}$, $5^{(a)}$	2 trains	C	SR 3.3.1.5	NA	NA

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

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 2.2-1

Table 3.3.1-1 (page 7 of 8)
Reactor Trip System Instrumentation

Note 1

Note 1: Overtemperature ΔT

Note 3

The Overtemperature ΔT Function Allowable Value shall not exceed the following ~~[~~Nominal Trip Setpoint~~]~~ by more than ~~[3.8]~~ 1.9% of ΔT span. ③

INSERT 6

~~$\Delta T \frac{(1+T_1 S)}{(1+T_2 S)}\left(\frac{1}{1+T_3 S}\right) \leq \Delta T_Q \left\{K_1 - K_2 \frac{(1+T_4 S)}{(1+T_5 S)}\left[T \frac{1}{(1+T_6 S)} - T'\right] + K_3 (P - P') - f_1(\Delta I)\right\}$~~ ②

Where: ΔT is measured RCS ΔT,°F.

$\Delta T_{~~Q~~}$ 0 is the indicated ΔT at RTP,°F. ②

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. ③

P is the measured pressurizer pressure, psig

P' is the nominal RCS operating pressure, ~~≥~~ = ~~[~~*~~]~~ psig ② ③

K_1 ≤ ~~[~~*~~]~~ K_2 ≥ ~~[~~*~~]~~/°F K_3 ~~≥~~ = ~~[~~*~~]~~/psig ②

~~T~~ τ $_1$ ≥ ~~[~~*~~]~~ sec ~~T~~ τ $_2$ ≤ ~~[~~*~~]~~ sec ~~T_3 ≤ [*] sec~~ ③

~~T~~ τ $_4$ ≥ ~~[~~*~~]~~ sec ~~T~~ τ $_5$ ≤ ~~[~~*~~]~~ sec ~~T_6 ≤ [*] sec~~

INSERT 7 ②

~~$f_1(\Delta I)$ = [*] {[*] - (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 ~~[~~~~]~~ * (including QTNL, QTPL, QTNS, and QTPS) are specified in the COLR. ②

②

INSERT 6

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0\left\{K_1 - K_2\left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)\left[T - T'\right] + K_3\left(P - P'\right) - f_1(\Delta I)\right\}$$

②

INSERT 7

and f_1 (ΔI) is a function such that:

(i) for q_t - q_b between QTNL* and QTPL* f_1 (ΔI) = 0

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QTPL*, the ΔT nominal trip setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

Table 2.2-1

Table 3.3.1-1 (page 8 of 8)
Reactor Trip System Instrumentation

Note 2

Note 2: Overpower ΔT

Note 4

The Overpower ΔT Function Allowable Value shall not exceed the following ~~[~~Nominal Trip Setpoint~~]~~ by more than ~~[3]~~ 1.7 % of ΔT span. ③

INSERT 8

$$\Delta T\frac{(1+T_1S)}{(1+T_2S)}\left(\frac{1}{1+T_3S}\right)\le\Delta T_Q\left\{K_4-K_5\frac{T_7S}{1+T_7S}\left(\frac{1}{1+T_6S}\right)T-K_6\left[T\frac{1}{1+T_6S}-T''\right]-f_2(\Delta I)\right\}$$

②

Where: ΔT is measured RCS ΔT,°F.
$\Delta T_{\sout{Q}}$ 0 is the indicated ΔT at RTP,°F. ②
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. ③

K_4 ≤ ~~[~~*~~]~~

τ 3 ~~T_1~~ ≥ ~~[~~*~~]~~ sec

~~T_6 ≤ [*] sec~~

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

τ 4 ~~T_2~~ ≤ ~~[~~*~~]~~ sec

~~T_7 ≥ [*] sec~~

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

τ 5 ~~T_3 ≤~~ ≥ ~~[~~*~~]~~ sec ③ ②

~~$f_2(\Delta I)$ = [*]~~ INSERT 9

INSERT 10

These values denoted with ~~[~~~~]~~ * (including QPNL, QPPL, QPNS, and QPPS) are specified in the COLR. ②

Note 5

INSERT 11

②

INSERT 8

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right)T - K_6\left(T - T''\right) - f_2(\Delta I)\right\}$$

②

INSERT 9

and f_2 (ΔI) is a function such that:

(i) for q_t - q_b between QPNL* and QPPL* f_2 (ΔI) = 0

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QPNL*, the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QPPL*, the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

②

INSERT 10

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.

②

INSERT 11

Note 3: Trip Time Delay - Steam Generator Water Level -- Low-Low

T_s = $\{(-0.00583)\ (P)^3 + (0.735)\ (P)^2 - (33.560)\ (P) + 649.5\}$ 0.99 secs.

T_m = $\{(-0.00532)\ (P)^3 + (0.678)\ (P)^2 - (31.340)\ (P) + 589.5\}$ 0.99 secs.

Where:

P = RCS Loop ΔT Equivalent to Power (% RTP), $P \leq 50\%$ RTP

T_s = Time delay for Steam Generator Water level -- Low-Low Reactor Trip, one Steam Generator affected. (Secs.)

T_m = Time delay for Steam Generator Water Level -- Low-Low Reactor Trip, two or more Steam Generators affected. (Secs.)

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

1. NUREG 1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0 provides two sets of specifications for Section 3.3.1; one for adoption "Without a Setpoint Control Program," (3.3.1.A) the other for adoption "With a Setpoint Control Program," (3.3.1.B). This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation and is removed.

2. 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, FUNCTIONS, and Footnotes.

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

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

5. ISTS 3.3.1 ACTIONS has been modified to include new ACTIONS R and U, S, and T. These new ITS ACTIONS reflect CTS Table 3.3-1 ACTION 9, ACTION 11, and ACTION 10, respectively.

6. ISTS SR 3.3.1.1, ISTS SR 3.3.1.2, ISTS SR 3.3.1.3, ISTS SR 3.3.1.4, ISTS SR 3.3.1.5, ISTS SR 3.3.1.6, ISTS SR 3.3.1.7, ISTS SR 3.3.1.8, ISTS SR 3.3.1.9, ISTS SR 3.3.1.10, ISTS SR 3.3.1.11, ISTS SR 3.3.1.14, and ISTS SR 3.3.1.16 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, except for those Frequencies that are event driven or related to specific conditions, the Frequencies for ITS SR 3.3.1.1, ITS SR 3.3.1.2, ITS SR 3.3.1.3, ITS SR 3.3.1.4, ITS SR 3.3.1.5, ITS SR 3.3.1.6, ITS SR 3.3.1.7, ITS SR 3.3.1.8, ITS SR 3.3.1.9, ITS SR 3.3.1.10, ITS SR 3.3.1.11, ITS SR 3.3.1.12, and ITS SR 3.3.1.14 are "In accordance with the Surveillance Frequency Control Program."

7. ISTS LCO 3.3.1 contains three Surveillance Requirements requiring performance of a CHANNEL CALIBRATION. ISTS SR 3.3.1.12 is one of these three SRs with the difference being it contains a Note stating, "This Surveillance shall include verification of Reactor Coolant System resistance temperature detector bypass loop flow rate." ISTS associates this Note with ISTS Table 3.3.1-1 Functions 6 (Overtemperature ΔT) and 7 (Overpower ΔT). TVA modified SQN to remove the bypass manifolds and installation of thermowell mounted fast response RTDs installed directly into the reactor coolant piping. The NRC approved this change under License Amendment 141 for Unit 1 (ADAMS Accession No. ML013310103) and License Amendment 132 for Unit 2 (ADAMS Accession NO. ML013330076). Because these Functions no longer use bypass loops, the Note requiring verification of flow is no longer necessary. Therefore, this CHANNEL CALIBRATION has been

eliminated and the associated CHANNEL CALIBRATION for Functions 6 and 7 has been changed to SR 3.3.1.10.

8. ISTS LCO 3.3.1 Table 3.3.1-1 requires performance of a COT (SR 3.3.1.13) for Functions 18.a (Reactor Trip System Interlocks, Intermediate Range Neutron Flux, P-6), 18.c (Reactor Trip System Interlocks, Power Range Neutron Flux, P-8), 18.d (Reactor Trip System Interlocks, Power Range Neutron Flux, P-9), 18.e, (Reactor Trip System Interlocks Power Range Neutron Flux, P-10), and 18.f (Reactor Trip System Interlocks, Turbine Impulse Pressure, P-13). CTS required a similar test (CHANNEL FUNCTIONAL TEST) before License Amendment 141 for Unit 1 (ADAMS Accession No. ML013310103) and License Amendment 132 for Unit 2 (ADAMS Accession NO. ML013330076) where TVA requested and NRC approved deletion of the CHANNEL FUNCTIONAL TESTs for the Reactor Trip System Interlocks. Therefore, this COT has been deleted.

9. Due to the deletion of ISTS SR 3.3.1.12 and ISTS SR 3.3.1.13, subsequent SRs have been renumbered.

10. TSTF-493-A, Rev. 4, "Clarify Application of Setpoint Methodology for LSSS Functions," (TSTF-493-A) (ADAMS Accession Numbers ML100060064 and ML101160026) provides two options for columns in ISTS Table 3.3.1-1. These options are either listing only the Allowable Valve (single column option) or listing the Allowable Value and the Nominal Trip Setpoint (multiple column option). If the multiple column option is chosen TSTF-493-A states, "Those plants that utilize the "multiple column" format are not required to incorporate the NTSP value in the last sentence in Note 2 because any change to the value requires prior NRC review and the values cannot be changed by the licensee under 10 CFR 50.59." Note 2 in the "Proposed Change" section of TSTF-493-A is the same Note as Note (c) in ISTS Table 3.3.1-1. Because SQN ITS uses the multiple column option, NTSP is deleted from Note (c).

11. ISTS SR 3.3.1.16 (ITS SR 3.3.1.14) requires verification that RTS RESPONSE TIME is within limits. This requirement has been deleted from ITS Table 3.3.1-1 Function 5 (Source Range Neutron Flux). This change is made to achieve consistency with the SQN Units 1 and 2 current licensing basis reflected in UFSAR Table 7.2.1-5.

12. Editorial changes made for consistency within the Specification.

13. ISTS Table 3.3.1-1 Function 8.a (Pressurizer Pressure, Low) Applicable MODES or other Specified Conditions is listed as MODE $1^{(h)}$, where Footnote (h) states, "Above the P-8 (Power Range Neutron Flux) interlock." The Pressurizer Pressure, Low reactor trip is interlocked with the P-7 interlock not the P-8 interlock and is therefore changed to MODE $1^{(g)}$ to reflect the associations with the P-7 interlock.

14. CTS Table 3.3-1, Table 4.3-1, and Table 2.2-1 include Functional Unit 14 (Main Steam Generator Water Level—Low-Low). ISTS includes a similar Function, ISTS Function 14 (Steam Generator (SG) Water Level – Low Low), but does not include the Environmental Allowance Modifier (EAM) or the Trip Time Delay (TTD) features. Changes are made to present the CTS Functional Unit 14 in ISTS format.

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

B 3.3 INSTRUMENTATION

B 3.3.1~~A~~ Reactor Trip System (RTS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

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 include LSSS ~~for variables that have significant safety functions~~. LSSS are defined by the regulation as INSERT 1 "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a 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. 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 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~~ ③

② INSERT 1

settings for automatic protective devices related to those variables having significant safety functions. The regulation also states,

BASES

BACKGROUND (continued)

~~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.~~

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note c of Table 3.3.1-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ ③

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

The ~~[~~Nominal Trip Setpoint (NTSP)~~]~~ specified in Table 3.3.1-1 is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[~~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). ④ ④ ④ ④

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. ④ ④ ④

BASES

BACKGROUND (continued)

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 within the established as-left tolerance around the ~~[~~NTSP~~]~~ to account for further drift during the next surveillance interval. ④

~~[Note: Alternatively, a Technical Specification format incorporating an Allowable Value only column may be proposed by a licensee. In this, case, the [NTSP] value and the methodologies used to calculate the as-found and as-left tolerances must be specified in [insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]. Changes to the actual plant trip setpoint or [NTSP] value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements.]~~ ④

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. Fuel centerline melt shall not occur, and
3. The RCS pressure SL of ~~[~~2735~~]~~ psig shall not be exceeded. ④

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 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 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.

The RTS instrumentation is segmented into four distinct but interconnected modules as illustrated in Figure ~~[ ]~~ 7.2.2-2, U FSAR, Chapter ~~[~~7~~]~~ (Ref. 2), and as identified below: ④ ②

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

BASES

BACKGROUND (continued)

Process

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 channels, and control board/control room/miscellaneous indications, ② ② ⑤

analog to digital conversion (Digital Protection System),

, setpoint comparator, or contact

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 ②

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. ② ②

reactor trip breakers

<u>Field Transmitters or Sensors</u>

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 ~~[~~NTSP~~]~~ and Allowable Value. 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. ④

<u>Signal Process Control and Protection System</u>

analog to digital conversion (Digital Protection System),

U

, setpoint comparator, or contact

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 ~~[~~NTSPs~~]~~ derived from Analytical Limits established by the safety analyses. Analytical Limits 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 ② ④ ② ④ ②

BASES

BACKGROUND (continued)

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.

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.

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.

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.

Allowable Values and Nominal Trip Setpoints

, setpoint comparators, or contacts

4 The trip setpoints used in the bistables are based on the analytical limits ②
stated in Reference ~~2~~. The calculation of the ~~[~~NTSP~~]~~ specified in ② ④
Table 3.3.1-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those 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 ④
the methodology used to calculate the Allowable Values and ~~[~~NTSP~~]~~, ②
including their explicit uncertainties, is provided in the ~~"RTS/ESFAS~~

plant specific

BASES

BACKGROUND (continued)

UFSAR Section 7.1.2

or setpoint comparator

Setpoint Methodology Study~~"~~ (Ref. 7) which incorporates all of the known uncertainties applicable to each channel. The as-left tolerance and as-found tolerance band methodology is provided in ~~"[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~." The magnitudes of these uncertainties are factored into the determination of each ~~[~~NTSP~~]~~ and corresponding Allowable Value. The trip setpoint entered into the bistable is more conservative than that specified by the Allowable Value to account for measurement errors detectable by the CHANNEL OPERATIONAL TEST (COT). The Allowable Value serves as the as-found Technical Specification OPERABILITY limit for the purpose of the COT. ② ④ ④ ②

or setpoint comparator

or setpoint comparator

The ~~[~~NTSP~~]~~ is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[~~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" ~~[~~NTSP~~]~~ value is within the as-left tolerance band for CHANNEL CALIBRATION uncertainty allowance (i.e., ± rack calibration and comparator setting uncertainties). The ~~[~~NTSP~~]~~ value is therefore considered a "nominal" value (i.e., expressed as a value without inequalities) for the purposes of COT and CHANNEL CALIBRATION. ④ ② ④ ② ④ ④

~~[~~NTSPs ~~]~~, in conjunction with the use of as-found and as-left tolerances, together 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). ④

Note that the Allowable Values listed in Table 3.3.1-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION, COTs, or a TRIP ACTUATING DEVICE OPERATIONAL TEST that requires trip setpoint verification

.

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 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.

BASES

BACKGROUND (continued)

Solid State Protection System

, setpoint comparators, or contacts

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 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. 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. ②

The 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.

, setpoint comparator, or contact

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 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. ②

Reactor Trip Switchgear

reactor trip breakers

reactor trip breaker

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. ② ②

reactor trip breakers

reactor trip breakers

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 ② ②

BASES

BACKGROUND (continued)

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.

2 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 channels 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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RTS functions to preserve 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.

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 that are retained yet not specifically credited in the accident analysis are implicitly 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.

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.

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 to be OPERABLE. The Allowable Value specified in Table 3.3.1-1 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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

with respect to the Allowable Value during a CHANNEL CALIBRATION or COT. As such, the Allowable Value differs from the ~~[~~NTSP~~]~~ by an amount ④ ~~[~~greater than or~~]~~ equal to the expected instrument channel uncertainties, ④ 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 ④ 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).

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~~]~~ ④ (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 as-found condition will be entered into the Corrective Action Program for further evaluation.

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

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 RTS channel is also used as a control system input. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires RTS action. In this case, the RTS 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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

system and protection system interaction that could simultaneously create a need for RTS trip and disable one RTS 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 System Functions

The safety analyses and OPERABILITY requirements applicable to each RTS 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.

INSERT 2

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. ⑥

In MODE 1 or 2, manual initiation of a reactor trip must be OPERABLE. These are the MODES in which the reactor is critical ~~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

⑤ **INSERT 2**

There are two Manual Reactor Trip channels arranged in a one-out-of-two logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. ②

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.

INSERT 3

The LCO requires all four of the Power Range Neutron Flux - High channels to be OPERABLE. ⑥

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. 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.

⑤ **INSERT 3**

There are four Power Range Neutron Flux – High channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

INSERT 4

The LCO requires all four of the Power Range Neutron Flux - Low channels to be OPERABLE. ⑥

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 administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

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.

INSERT 5

The LCO requires all four of the Power Range Neutron Flux - High Positive Rate channels to be OPERABLE. ⑥

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 ②

in MODE

with Rod Control System capable of rod withdrawal or one or more rods not fully inserted,

⑤

INSERT 4

There are four Power Range Neutron Flux – Low channels arranged in a two-out-of-four logic.

⑤

INSERT 5

There are four Power Range Neutron Flux – High Positive Rate channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

with Rod Control System incapable of rod withdrawal and all rods fully inserted, there is

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. ②

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 a nonconservative local DNBR. DNBR is defined as the ratio of the 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.

INSERT 6

The LCO requires all four Power Range Neutron Flux - High Negative Rate channels to be OPERABLE. ⑥

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. ②

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

⑤

INSERT 6

There are four Power Range Neutron Flux – High Negative Rate channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

There are two Intermediate Range Neutron Flux channels arranged in a one-out-of-two logic. 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. ⑥

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 Rod Control System is not capable of rod withdrawal or the Source Range Neutron Flux function is required to be OPERABLE, providing protection. ~~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.~~ ② 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. Source Range Neutron Flux

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

The Source Range Neutron Flux Function provides protection for control rod withdrawal from subcritical~~,~~ boron dilution ~~and control rod ejection~~ events. ②

and

There are two Source Range Neutron Flux channels arranged in a one-out-of-two logic.

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~~. ⑥ ②

drawer input is shorted out, driving the output of the drawer to zero

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. ⑦

Monitoring Instrumentation (BDMI)

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:

pressurizer ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- 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,

- pressurizer pressure - the Trip Setpoint is varied to correct for changes in system pressure, and

- 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.

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. Trip occurs if Overtemperature ΔT is indicated in two loops. ~~At some units,~~ the pressure and temperature signals are used for other control functions. Therefore, ~~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

There are four Overtemperature ΔT channels arranged in a two-out-of-four logic. 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 RTS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. ⑥ ②

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.

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
- 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. Trip occurs if Overpower ΔT is indicated in two loops. ~~At some units,~~ the temperature signals are used for other control functions. Therefore, ~~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

There are four Overpower ΔT channels arranged in a two-out-of-four logic. 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 RTS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. ⑥ ②

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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,~~ the Pressurizer Pressure channels are also used to provide input to the Pressurizer Pressure Control System. ~~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. ② ②

a. Pressurizer Pressure - Low

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

There are four Pressurizer Pressure - Low channels arranged in a two-out-of-four logic.

The LCO requires four channels ~~for two and four loop units (three channels for three loop units)~~ of Pressurizer Pressure - Low to be OPERABLE. ⑥ ②

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.~~ ⑧

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.

There are four Pressurizer Pressure - High channels arranged in a two-out-of-four logic.

The LCO requires four channels ~~for two and four loop units (three channels for three loop units)~~ of the Pressurizer Pressure - High to be OPERABLE. ⑥

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. <u>Pressurizer Water Level - High</u>

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.

There are three Pressurizer Level - High channels arranged in a two-out-of-three logic. ⑥

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 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.~~ ⑨

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 35 ~~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. INSERT 7 The flow signals are not used for any control system input. ② ⑥

INSERT 8 ⑥

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

In MODE 1 above the P-8 setpoint, a loss of flow in one RCS loop 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 setpoint, all reactor trips on low flow are automatically blocked ~~since there is insufficient heat production to generate DNB conditions~~. ⑧

~~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.~~

~~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.~~ ⑦

~~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~~

⑤

INSERT 7

There are three per loop Reactor Coolant Flow - Low channels using these detectors and are arranged in a two-out-of-three logic for each loop.

⑤

INSERT 8

Design flow is 94,600 (91,400 X 1.035) gpm per loop (Reference 14). UFSAR Table 5.1-1 lists this value as the Full Power Operability Flow, gpm/loop.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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 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.~~

~~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.~~

~~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. 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 RCS loops is automatically enabled. Above the P-8 setpoint,~~

⑦

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~ ⑦

11 ~~12~~. Undervoltage Reactor Coolant Pumps (RCPs) ⑦

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. ②

There are four (one per bus) Undervoltage RCP channels arranged in a two-out-of-four logic. The LCO requires ~~three~~ four Undervoltage RCPs channels (one per ~~phase) per~~ bus) to be OPERABLE. ⑥ ②

In MODE 1 above the P-7 setpoint, the Undervoltage RCP 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. ~~This Function uses the same relays as the ESFAS Function 6.f, "Undervoltage Reactor Coolant Pump (RCP)" start of the auxiliary feedwater (AFW) pumps.~~ ②

12 ~~13~~. Underfrequency Reactor Coolant Pumps ⑦

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. ⑤

There are four (one per bus) Underfrequency RCP channels arranged in a two-out-of-four logic. The LCO requires ~~three~~ four Underfrequency RCPs channels (one per bus) to be OPERABLE. ⑥ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. INSERT 9 ②

13

~~1~~4. Steam Generator Water Level - Low Low

INSERT 10
INSERT 11 ②

~~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 Auxiliary Feedwater (AFW) ~~AFW~~ pumps on low low SG level.

INSERT 12

The LCO requires three ~~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~~. ⑥ ②

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.

② INSERT 9

Note that this Function also provides a signal to trip all four reactor coolant pumps.

② INSERT 10

The Steam Generator Water Level Low-Low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater or a feedwater system pipe break outside of containment. This function also provides input to the steam generator level control system. IEEE-279 requirements are satisfied by 2/3 logic for protection function actuation, thus allowing for a single failure of a channel and still performing the protection function.

Control/protection interaction is addressed by the use of the Median Signal Selector that prevents a single failure of a channel providing input to the control system requiring protection function action. That is, a single failure of a channel providing input to the control system does not result in the control system initiating a condition requiring protection function action. The Median Signal Selector performs this by not selecting the channels indicating the highest or lowest steam generator levels as input to the control system.

With the transmitters located inside containment and thus possibly experiencing adverse environmental conditions (due to a feedline break), the Environmental Allowance Modifier (EAM) was devised. The EAM function (Containment Pressure (EAM) with a setpoint of < 0.5 psig) senses the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low-Low trip setpoint (Adverse) which reflects the increased transmitter uncertainties due to this environment. The EAM allows the use of a lower Steam Generator Water Level - Low-Low (EAM) trip setpoint when these conditions are not present, thus allowing more margin to trip for normal operating conditions.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. Two time delays are calculated, based on the number of steam generators indicating less than the Low-Low Level trip setpoint and the primary side power level. The magnitude of the delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low level trips.

②
INSERT 11

In the event of failure of a Steam Generator Water Level channel, it is placed in the trip condition as input to the Solid State Protection System and does not affect either the EAM or TTD setpoint calculations for the remaining operable channels. Failure of the Containment Pressure (EAM) channel to a protection set also does not affect the EAM setpoint calculations. It is then necessary for the operator to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set, through the Eagle-21 System Man-Machine-Interface (MMI) test cart. Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. Although not affecting the TTD calculation, this results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the MMI, or place the affected protection sets Steam Generator Water Level - Low-Low channel in trip.

⑤ ②
INSERT 12

There are three Steam Generator Water Level Low-Low channels per steam generator arranged in a two-out-of-three logic. These channels are arranged in four protection sets with each channel of the Containment Pressure (EAM) and RCS Loop ΔT inputting into its associated protection set.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~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.~~ ⑦

14 ~~16~~. Turbine Trip ⑦

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,

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

approximately 50% power, will not actuate a reactor trip. Three pressure switches monitor the auto stop ~~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.

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.

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 above ~~below~~ the P-9 ② setpoint, approximately 50% power. This action will ~~not~~ actuate ② 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 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

Below the P-9 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.

15 ~~17~~. <u>Safety Injection Input from Engineered Safety Feature Actuation System</u> ⑦

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 not a condition of acceptability for the LOCA. However, other transients 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~~ solid state logic in the ESFAS. Therefore, there is no measurement signal with which to associate an LSSS. ②

There are two trains of SI input from ESFAS arranged in a one-out-of-two logic. The LCO requires two trains of SI Input from ESFAS to be OPERABLE in MODE 1 or 2. ⑥

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~~. <u>Reactor Trip System Interlocks</u> ⑦

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:

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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~~ four decades 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: ②

- 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~~ input to the SR drawer is shorted out driving the output of drawer to zero, ②
- 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.~~ ②

There are two Intermediate Range Neutron Flux, P-6 channels arranged in a one-out-of-two logic. 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. ⑤

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 from either the Power Range Neutron Flux, P-10, or the Turbine Impulse Pressure, P-13 interlock. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

- Pressurizer Pressure - Low,
- Pressurizer Water Level - High,
- Reactor Coolant Flow - Low (low flow in two or more RCS loops),
- ~~RCPs Breaker Open (Two Loops),~~ ②
- Undervoltage RCPs, and
- Underfrequency RCPs.

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. 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,
- Pressurizer Water Level - High,
- Reactor Coolant Flow - Low (low flow in two or more RCS loops),
- ~~RCP Breaker Position (Two Loops),~~ ②
- Undervoltage RCPs, and
- Underfrequency RCPs.

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
35 approximately ~~48~~% power as determined by two-out-of-four NIS ②
power range detectors. The P-8 interlock automatically enables
the Reactor Coolant Flow - Low ~~and RCP Breaker Position~~
~~(Single Loop)~~ reactor trip~~s~~ on low flow in one or more RCS loops ②
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
35 greater than approximately ~~48~~% power. On decreasing power, ②
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.

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

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.

e. Power Range Neutron Flux, P-10

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,
- on increasing power, the P-10 interlock allows the operator to manually block the Power Range Neutron Flux - Low reactor trip,
- 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~~ shorts out the input to the SR drawer, driving the output of drawer to zero, ②
- the P-10 interlock provides one of the two inputs to the P-7 interlock, and
- 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.

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.

f. Turbine Impulse Pressure, P-13

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

~~1~~9. Reactor Trip Breakers ⑦

reactor trip breakers

There are two Reactor Trip Breakers arranged in a one-out-of-two logic.

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 RTS 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 RTS trip capability. ② ⑥

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

18 ~~20~~. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms ⑦

The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each reactor trip breaker ~~RTB~~ that is in service. ② 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 17 ~~19~~ above. ② 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 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 ⑦

The LCO requirement for the reactor trip breakers ~~RTBs~~ (Functions 17 and 18 ~~19 and 20~~) and Automatic Trip Logic (Function 19 ~~21~~) ensures that means are provided to interrupt the power to allow the rods to fall into the reactor core. ② ⑦ Each reactor trip breaker ~~RTB~~ is equipped with an undervoltage coil and a shunt trip coil to trip the breaker open when needed. Each reactor trip breaker ~~RTB~~ is equipped with a bypass breaker to allow testing of the trip breaker while the unit is at power. ② The reactor trip signals generated by the RTS Automatic Trip Logic cause the reactor trip breakers ~~RTBs~~ and associated bypass breakers to open and shut down the reactor. ②

There are two RTS Automatic Trip Logic trains arranged in a one-out-of-two logic. The LCO requires two trains of RTS Automatic Trip Logic to be OPERABLE. Having two OPERABLE channels ensures that random failure of a single logic channel will not prevent reactor trip. ⑥

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

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

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.~~
~~--~~ ③

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 setting is found nonconservative with respect to ② the Allowable Value, or the channel is not functioning as required, or the transmitter, instrument loop, signal processing electronics, setpoint comparator trip output, contact output, or bistable is ② 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 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.~~
~~--~~ ③

A.1

Condition A applies to all RTS 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.

BASES

ACTIONS (continued)

B.1 and B.2

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,
- ~~RTBs~~ reactor trip breakers, ②
- ~~RTB~~ reactor trip breaker Undervoltage and Shunt Trip Mechanisms, and
- Automatic Trip Logic.

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

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). ②

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)."

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. ~~]~~ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~ ③
~~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.~~
~~--~~

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~~ the movable incore detectors once per 12 hours may not be necessary. ⑤

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux - Low,
- Overtemperature ΔT,

BASES

ACTIONS (continued)

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

⑦

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. ~~]~~ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The below text should be used for plants with installed bypass test capability:~~
~~--~~ ③

~~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.~~ ②

BASES

ACTIONS (continued)

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 to 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. ⑤

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 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.

BASES

ACTIONS (continued)

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~~ reactor trip breakers must be opened immediately. With the ~~RTBs~~ reactor trip breakers open, the core is in a more stable condition. ②

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

BASES

ACTIONS (continued)

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,
- Pressurizer Water Level - High,
- Reactor Coolant Flow – Low,
- Undervoltage RCPs, and
- 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, placing the channel in the tripped condition when above the P-8 setpoint results in a partial trip condition requiring only one additional channel in the same loop to initiate a reactor trip. For the latter trip Function, 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. 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.

ACTIONS (continued)

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. ~~]~~ ④ ④

~~-------------------------------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.~~
~~---~~ ③

~~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.~~

~~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 status and the 4 additional hours allowed to reduce THERMAL POWER to below the P-8 setpoint are justified in Reference 11.~~ ⑦

~~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.~~

BASES

ACTIONS (continued)

~~M.1 and M.2~~ ⑦

~~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.~~

~~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.~~

~~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.~~

~~N~~L.1 and ~~N~~L.2 ⑦

Condition ~~N~~ L 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 Low Fluid Oil Pressure channel or three additional Turbine Stop Valve Closure channels 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 ②

~~[~~ 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. ~~]~~ ④ ④

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 8.~~
~~---~~ ③

M

~~O~~.1 and ~~O~~.2 ⑦

M

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. ⑦ ⑦ ⑦

M

M

An additional 6 hours is allowed to place the unit in MODE 3.

Six

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.~~]~~ ④ ② ④

reactor trip breaker

~~----------------------------------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 supports. The longer time limit for the logic train ([4] hours) is acceptable based on Reference 12.~~
~~---~~ ③

BASES

ACTIONS (continued)

N

~~P~~.1 and ~~P~~.2 ⑦

~~----------------------------------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."~~

~~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.~~ ③

~~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 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.~~

BASES

ACTIONS (continued)

~~Use the following Bases if WCAP-14333-P-A, Rev. 1 is adopted without adopting WCAP-15376-P:~~ ③

~~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.~~

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

Condition ~~P~~ N applies to the ~~RTBs~~ reactor trip breakers in MODES 1 and 2. These actions address the train orientation of the RTS for the ~~RTBs~~ reactor trip breakers. 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. An additional 6 hours is allowed to place the unit in MODE 3. ~~The Completion Time of 6~~ Six hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. ② ⑦ ⑦

Placing the unit in MODE 3 results in Condition C entry while an ~~RTB~~ reactor trip breaker is inoperable. ②

BASES

ACTIONS (continued)

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. ② ③

~~Q~~ O.1 and ~~Q~~ O.2 ⑦

Condition ~~Q~~ O 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. An additional 6 hours is allowed to place the unit in MODE 3. ~~The Completion Time of 6~~ Six 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. ⑦ ⑦

~~R~~ P.1 and ~~R~~ P.2 ⑦

Condition ~~R~~ P 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. An additional 6 hours is allowed to place the unit in MODE 2. ~~The Completion Time of 6~~ Six hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems. ⑦ ⑦

BASES

ACTIONS (continued)

~~S~~ Q.1 and ~~S~~ Q.2 ⑦

Condition ~~S~~ Q applies to the ~~RTB~~ reactor trip breaker 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~~ Six 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~~ reactor trip breaker trip mechanism. ~~The~~ The Required Actions have been modified by a Note. The Notes states that the affected ~~RTB~~ reactor trip breaker shall not be bypassed while one of the diverse features is inoperable except for ~~the time required~~ up to 4 hours to perform maintenance to one of the diverse features. The allowable time for performing maintenance of the diverse features is ~~2~~ 4 hours for the reasons stated under Condition ~~P~~ N. ⑦ ② ⑦ ② ⑦ ⑦

The Completion Time of 48 hours for Required Action ~~S~~ Q.1 is reasonable considering that in this Condition there is one remaining diverse feature for the affected ~~RTB~~ reactor trip breaker, and one OPERABLE ~~RTB~~ reactor trip breaker capable of performing the safety function and given the low probability of an event occurring during this interval. ⑦ ②

INSERT 13 INSERT 14 INSERT 15 ②

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.~~
~~---~~ ③

~~------------------------------ REVIEWER'S NOTE ------------------------------~~
~~Notes b and c are applied to the setpoint verification Surveillances for each RTS instrumentation Function in Table 3.3.1-1 unless one or more of the following exclusions apply:~~

~~1. Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~ ③

②

INSERT 13

R.1 and R.2

Condition R applies to the following reactor trip Functions:

- Steam Generator Water Level--Low-Low (Adverse), and
- Steam Generator Water Level--Low-Low (EAM)

A known inoperable channel must be placed in the tripped condition within 6 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.

In addition to placing the channel in the tripped condition it is also necessary to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set within 4 hours.

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.

②

INSERT 14

S.1, S.2, and S.3

Condition S applies to the Containment Pressure (EAM) coincident with Steam Generator Water Level--Low-Low (Adverse) reactor trip.

Failure of the Containment Pressure (EAM) channel to a protection set does not affect the EAM setpoint calculations. A known inoperable Containment Pressure channel results in the requirement to adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoints for the affected protection set to the same value as Steam Generator Water Level - Low-Low (Adverse) within 6 hours.

An alternative to adjusting the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints is to place the associated protection set's SG Water Level Low-Low channels in the tripped condition within 6 hours

If neither of the above Required Actions are completed within their associated Completion Time, then the unit must be placed in a MODE where these Functions are not required OPERABLE This requires the unit be placed in MODE 3 within 12 hours. The allowed Completion Times are reasonable to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE.

②

INSERT 15

T.1, T.2, and T.3

Condition T applies to the RCS Loop ΔT coincident with SG Water Level -- Low Low reactor trips.

Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP within 6 hours. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG level is removed.

An alternative to adjusting the threshold power level for zero seconds time delay is to place the affected protection set's SG Water Level Low-Low level channels in the tripped condition within 6 hours.

If neither of the above Required Actions can be completed within their associated Completion Times then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours. The allowed Completion Times are reasonable to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE.

U.

If the Required Action is not met within the specified Completion Time of Condition R, the unit must be placed in a MODE where this Function is not required OPERABLE. Six 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

~~---~~ ③

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.

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.

~~-------------------------------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.~~

~~---~~ ③

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. 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.

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 of 12 hours 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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the power range channel output. If the absolute difference is greater than 2 percent ~~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 absolute difference is greater than 2 percent ~~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. ⑦

~~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.~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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 nonconservative 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 nonconservative 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 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.~~ ②

~~-------------------------------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~~ ③
~~--~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~

~~an absolute difference greater than 2 percent~~ ⑦

⑨

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

~~OR~~

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

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

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output. 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~~ 96 hours is allowed for performing the first Surveillance after reaching ~~[~~15%~~]~~ RTP. ④ ⑦ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT. 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.

The reactor trip breaker ~~RTB~~ test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of reactor trip breaker ~~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 3.3.1.12 ~~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. ② ⑦

~~[The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 13.~~ ⑨

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested 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.~~ ⑨

~~OR~~

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

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

[~~The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.~~ ⑨

~~OR~~

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

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

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT.

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 conservative with respect to the Allowable Values specified in Table 3.3.1-1.

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.

The "as-found" ~~[~~and "as-left"~~]~~ values must also be recorded and reviewed for consistency with the assumptions of Reference 9. ④

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 reactor trip breakers ~~RTBs~~ are open and SR 3.3.1.7 is no ⑤ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

longer required to be performed. If the unit is to be in MODE 3 with the reactor trip breakers ~~RTBs~~ closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3. ②

~~[The Frequency of 184 days is justified in Reference 9.~~ ⑨

~~OR~~

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

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

SR 3.3.1.7 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ④ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~ ③
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~--~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

SR 3.3.1.8

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 stating 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 ~~[~~the Frequency specified in the Surveillance Frequency Control Program ~~OR 184 days]~~ or 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 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.~~

⑤ ⑨ ⑦ ④ ④ ④ ④ ④ ⑨

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ⑨

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

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

SR 3.3.1.8 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the~~ [~~NTSP~~]~~. Where a setpoint ④ more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance ④ procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the~~ [~~NTSP~~]~~, then the channel shall be ④ declared inoperable.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~ ③
~~---~~

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in UFSAR Section 7.1.2 ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. ④

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~~. ⑨

~~OR~~

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

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

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 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

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.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as-found" values and ~~[~~NTSP ~~or the previous test "as-left" values]~~ must be consistent with the drift allowance used in the setpoint methodology. ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[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.~~ ⑨

~~OR~~

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

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

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.

SR 3.3.1.10 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. ④ Where a setpoint more conservative than the ~~[~~NTSP~~]~~ ④ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, ④ then the channel shall be declared inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~---~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. ④

UFSAR Section 7.1.2

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. 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.~~

~~OR~~ ⑨

consists of checking the discriminator voltage and adjusting if necessary. The CHANNEL CALIBRATION for the

comparing the output of the intermediate range drawer to the secondary side calorimetric and adjusting if necessary.

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint ④ more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance ④ procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be ④ declared inoperable.

~~----------------------------------REVIEWER'S NOTE----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~--~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in UFSAR Section 7.1.2 ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~. ④

~~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. 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.~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~

~~OR~~

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

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

~~SR 3.3.1.12 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the [NTSP]. Where a setpoint more conservative than the [NTSP] is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the [NTSP], then the channel shall be declared inoperable.~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

⑦

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~---~~

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

~~SR 3.3.1.13~~

~~SR 3.3.1.13 is the performance of a COT of RTS interlocks. 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 of 18 months is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~

~~OR~~

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

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

12

SR 3.3.1.~~14~~ ⑦

SR 3.3.1.~~14~~ is the performance of a TADOT of the Manual Reactor Trip~~,~~ ~~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~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~ ⑦ 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. ②

and manual

~~[The Frequency of 18 months is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~ ⑨

~~OR~~

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

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

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

13

SR 3.3.1.~~15~~ ⑦

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 ④ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.~~16~~ 14 ⑦

SR 3.3.1.~~16~~ 14 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)~~ UFSAR Table 7.2.1-5. Individual component response times are not modeled in the analyses. ⑦ ②

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 UFSAR 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. ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A and/or WCAP-14036-P.~~
~~---~~ ③

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[~~ WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 13 ~~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. ④ ② ④

~~[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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.14 ~~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. ⑦

REFERENCES

1. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."
2. UFSAR, Chapter ~~[~~7~~]~~. ② ④
3. UFSAR, Chapter ~~[~~6~~]~~. ② ④

BASES

REFERENCES (continued)

U

4. FSAR, Chapter ~~[~~15~~]~~. ② ④

5. IEEE-279-1971.

6. 10 CFR 50.49.

Calculation SQN-EEB-PL&S, Precautions, Limitations, and Setpoints for NSSS

7. ~~Plant specific setpoint methodology study~~. ②

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.]~~ ②

11

~~12~~. WCAP-10271-P-A, Supplement 2, June 1990. ②

12

~~13~~. WCAP-15376, Rev. 0, October 2000. ②

~~14.~~ ~~Technical Requirements Manual, Section 15, "Response Times."~~ ②

13

~~15~~. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995. ②

14. Letter from Siva P. Lingam (NRC) to Joseph W. Shea (TVA), "Sequoyah Nuclear Plant, Units 1 and 2 - Issuance of Amendments to Revise the Technical Specification to allow use of Areva Advanced W17 High Performance Fuel (TS-SQN-2011-07) (TAC NOS. ME6538 and ME6539), dated September 26, 2012. ②

B 3.3 INSTRUMENTATION

B 3.3.1~~A~~ Reactor Trip System (RTS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

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 include LSSS ~~for variables that have significant safety functions~~. LSSS are defined by the regulation as INSERT 1 "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a 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. 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 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~~ ③

② INSERT 1

settings for automatic protective devices related to those variables having significant safety functions. The regulation also states,

BASES

BACKGROUND (continued)

~~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.~~

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note c of Table 3.3.1-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ ③

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

~~--~~

The ~~[~~Nominal Trip Setpoint (NTSP)~~]~~ specified in Table 3.3.1-1 is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[~~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). ④ ④ ④ ④

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. ④ ④ ④

BASES

BACKGROUND (continued)

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 within the established as-left tolerance around the ~~[~~NTSP~~]~~ to account for further drift during the next surveillance interval. ④

~~[Note: Alternatively, a Technical Specification format incorporating an Allowable Value only column may be proposed by a licensee. In this, case, the [NTSP] value and the methodologies used to calculate the as-found and as-left tolerances must be specified in [insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]. Changes to the actual plant trip setpoint or [NTSP] value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements.]~~ ④

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. Fuel centerline melt shall not occur, and
3. The RCS pressure SL of ~~[~~2735~~]~~ psig shall not be exceeded. ④

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 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 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.

The RTS instrumentation is segmented into four distinct but interconnected modules as illustrated in Figure ~~[ ]~~7.2.2-2, UFSAR, Chapter ~~[~~7~~]~~ (Ref. 2), and as identified below: ④ ②

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

BASES

BACKGROUND (continued)

Process

analog to digital conversion (Digital Protection System),

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 channels, and control board/control room/miscellaneous indications, ② ② ⑤

, setpoint comparator, or contact

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 ②

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. ② ②

reactor trip breakers

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 ~~[~~NTSP~~]~~ and Allowable Value. ④ 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.

Signal Process Control and Protection System

analog to digital conversion (Digital Protection System),

U

, setpoint comparator, or contact

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, ② comparable output signals for instruments located on the main control board, and comparison of measured input signals with ~~[~~NTSPs~~]~~ derived ④ from Analytical Limits established by the safety analyses. Analytical Limits 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 ② ④ the predetermined setpoint, an output from a bistable is forwarded to the ② SSPS for decision evaluation. Channel separation is maintained up to and through the input bays. However, not all unit parameters require four

BASES

BACKGROUND (continued)

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.

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.

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.

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.

Allowable Values and Nominal Trip Setpoints

, setpoint comparators, or contacts

4

The trip setpoints used in the bistables are based on the analytical limits ②
stated in Reference ~~2~~. The calculation of the ~~[~~NTSP~~]~~ specified in ② ④
Table 3.3.1-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those 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 ④
the methodology used to calculate the Allowable Values and ~~[~~NTSP~~]~~, ②
including their explicit uncertainties, is provided in the ~~"RTS/ESFAS~~

plant specific

BACKGROUND (continued)

Setpoint Methodology Study~~"~~ (Ref. 7) which incorporates all of the known uncertainties applicable to each channel. The as-left tolerance and as-found tolerance band methodology is provided in ~~"[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~." The magnitudes of these uncertainties are factored into the determination of each ~~[~~NTSP~~]~~ and corresponding Allowable Value. The trip setpoint entered into the bistable is more conservative than that specified by the Allowable Value to account for measurement errors detectable by the CHANNEL OPERATIONAL TEST (COT). The Allowable Value serves as the as-found Technical Specification OPERABILITY limit for the purpose of the COT. ② ④ ④ ②

UFSAR Section 7.1.2

or setpoint comparator

The ~~[~~NTSP~~]~~ is the value at which the bistable is set and is the expected value to be achieved during calibration. The ~~[~~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" ~~[~~NTSP~~]~~ value is within the as-left tolerance band for CHANNEL CALIBRATION uncertainty allowance (i.e., ± rack calibration and comparator setting uncertainties). The ~~[~~NTSP~~]~~ value is therefore considered a "nominal" value (i.e., expressed as a value without inequalities) for the purposes of COT and CHANNEL CALIBRATION. ④ ② ④ ② ④ ④

or setpoint comparator

or setpoint comparator

~~[~~NTSPs~~]~~, in conjunction with the use of as-found and as-left tolerances, together 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). ④

Note that the Allowable Values listed in Table 3.3.1-1 are the least conservative value of the as-found setpoint that a channel can have during a periodic CHANNEL CALIBRATION, COTs, or a TRIP ACTUATING DEVICE OPERATIONAL TEST that requires trip setpoint verification

.

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 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.

BASES

BACKGROUND (continued)

Solid State Protection System

, setpoint comparators, or contacts

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 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. 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. ②

The 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.

, setpoint comparator, or contact

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 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. ②

Reactor Trip Switchgear

reactor trip breakers

reactor trip breaker

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. ② ②

reactor trip breakers

reactor trip breakers

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 ② ②

BASES

BACKGROUND (continued)

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.

The decision logic matrix Functions are described in the functional diagrams included in Reference ~~3~~ 2. 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 channels 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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RTS functions to preserve 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.

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 that are retained yet not specifically credited in the accident analysis are implicitly 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.

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.

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 to be OPERABLE. The Allowable Value specified in Table 3.3.1-1 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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

with respect to the Allowable Value during a CHANNEL CALIBRATION or COT. As such, the Allowable Value differs from the ~~[~~NTSP~~]~~ by an amount ④ ~~[~~greater than or~~]~~ equal to the expected instrument channel uncertainties, ④ 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 ④ 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).

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~~]~~ ④ (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 as-found condition will be entered into the Corrective Action Program for further evaluation.

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

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 RTS channel is also used as a control system input. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires RTS action. In this case, the RTS 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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

system and protection system interaction that could simultaneously create a need for RTS trip and disable one RTS 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 System Functions

The safety analyses and OPERABILITY requirements applicable to each RTS 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.

INSERT 2

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. ⑥

In MODE 1 or 2, manual initiation of a reactor trip must be OPERABLE. These are the MODES in which the reactor is critical ~~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

⑤

INSERT 2

There are two Manual Reactor Trip channels arranged in a one-out-of-two logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. ②

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.

INSERT 3

The LCO requires all four of the Power Range Neutron Flux - High channels to be OPERABLE. ⑥

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. 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.

⑤ INSERT 3

There are four Power Range Neutron Flux – High channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

INSERT 4

The LCO requires all four of the Power Range Neutron Flux - Low channels to be OPERABLE. ⑥

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 administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

3. <u>Power Range Neutron Flux Rate</u>

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

a. <u>Power Range Neutron Flux - High Positive Rate</u>

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.

INSERT 5

The LCO requires all four of the Power Range Neutron Flux - High Positive Rate channels to be OPERABLE. ⑥

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 ②

in MODE

with Rod Control System capable of rod withdrawal or one or more rods not fully inserted,

⑤ INSERT 4

There are four Power Range Neutron Flux – Low channels arranged in a two-out-of-four logic.

⑤ INSERT 5

There are four Power Range Neutron Flux – High Positive Rate channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

with Rod Control System incapable of rod withdrawal and all rods fully inserted, there is

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. ②

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 a nonconservative local DNBR. DNBR is defined as the ratio of the 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.

INSERT 6

The LCO requires all four Power Range Neutron Flux - High Negative Rate channels to be OPERABLE. ⑥

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. ②

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

⑤

INSERT 6

There are four Power Range Neutron Flux – High Negative Rate channels arranged in a two-out-of-four logic.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

There are two Intermediate Range Neutron Flux channels arranged in a one-out-of-two logic.

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. ⑥

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.

Rod Control System is not capable of rod withdrawal or the Source Range Neutron Flux function is required to be OPERABLE, providing protection.

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. ②

5. Source Range Neutron Flux

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

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

The Source Range Neutron Flux Function provides protection for control rod withdrawal from subcritical~~,~~ and boron dilution ~~and control rod ejection~~ events. ②

There are two Source Range Neutron Flux channels arranged in a one-out-of-two logic. ⑥

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~~ drawer input is shorted out, driving the output of the drawer to zero. ②

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)~~ Monitoring Instrumentation (BDMI)," for MODE 3, 4, or 5 and LCO 3.9.3, "Nuclear Instrumentation," for MODE 6. ⑦

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~~ pressurizer pressure, ② 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:

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- 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,
- pressurizer pressure - the Trip Setpoint is varied to correct for changes in system pressure, and
- 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.

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. Trip occurs if Overtemperature ΔT is indicated in two loops. ~~At some units,~~ the pressure and temperature signals are used for other control functions. Therefore, ~~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

There are four Overtemperature ΔT channels arranged in a two-out-of-four logic. 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 RTS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. ⑥ ②

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.

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
- 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. 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,~~ 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 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

There are four Overpower ΔT channels arranged in a two-out-of-four logic. 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 RTS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions. ⑥ ②

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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,~~ the Pressurizer Pressure channels are also used to provide input to the Pressurizer Pressure Control System. ~~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. ② ②

a. Pressurizer Pressure - Low

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

There are four Pressurizer Pressure - Low channels arranged in a two-out-of-four logic. The LCO requires four channels ~~for two and four loop units (three channels for three loop units)~~ of Pressurizer Pressure - Low to be OPERABLE. ⑥ ②

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.~~ ⑧

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.

There are four Pressurizer Pressure - High channels arranged in a two-out-of-four logic. The LCO requires four channels ~~for two and four loop units (three channels for three loop units)~~ of the Pressurizer Pressure - High to be OPERABLE. ⑥

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

There are three Pressurizer Level - High channels arranged in a two-out-of-three logic. ⑥

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 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.~~ ⑨

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 ~~48~~ 35% RTP, a loss of flow in any RCS loop will actuate a reactor trip. Each RCS loop has three flow detectors to monitor flow. INSERT 7 The flow signals are not used for any control system input. ② ⑥

INSERT 8 ⑥

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

In MODE 1 above the P-8 setpoint, a loss of flow in one RCS loop 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 setpoint, all reactor trips on low flow are automatically blocked ~~since there is insufficient heat production to generate DNB conditions~~. ⑧

~~11. Reactor Coolant Pump (RCP) Breaker Position~~ ⑦

~~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.~~

~~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~~

⑤

INSERT 7

There are three per loop Reactor Coolant Flow - Low channels using these detectors and are arranged in a two-out-of-three logic for each loop.

⑤

INSERT 8

Design flow is 94,600 (91,400 X 1.035) gpm per loop (Reference 14). UFSAR Table 5.1-1 lists this value as the Full Power Operability Flow, gpm/loop.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

⑦

~~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 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.~~

~~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.~~

~~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. 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 RCS loops is automatically enabled. Above the P-8 setpoint,~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~ ⑦

11 ~~12~~. Undervoltage Reactor Coolant Pumps (RCPs) ⑦

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. ②

There are four (one per bus) Undervoltage RCP channels arranged in a two-out-of-four logic. The LCO requires ~~three~~ four Undervoltage RCPs channels (one per ~~phase) per~~ bus) to be OPERABLE. ⑥ ②

In MODE 1 above the P-7 setpoint, the Undervoltage RCP 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. ~~This Function uses the same relays as the ESFAS Function 6.f, "Undervoltage Reactor Coolant Pump (RCP)" start of the auxiliary feedwater (AFW) pumps.~~ ②

12 ~~13~~. Underfrequency Reactor Coolant Pumps ⑦

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. ⑤

There are four (one per bus) Underfrequency RCP channels arranged in a two-out-of-four logic. The LCO requires ~~three~~ four Underfrequency RCPs channels (one per bus) to be OPERABLE. ⑥ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. INSERT 9 ②

13 ~~1~~4. Steam Generator Water Level - Low Low

INSERT 10
INSERT 11 ②

~~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 Auxiliary Feedwater (AFW) ~~AFW~~ pumps on low low SG level.

INSERT 12 The LCO requires three ~~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~~. ⑥ ②

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.

② INSERT 9

Note that this Function also provides a signal to trip all four reactor coolant pumps.

② INSERT 10

The Steam Generator Water Level Low-Low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater or a feedwater system pipe break outside of containment. This function also provides input to the steam generator level control system. IEEE-279 requirements are satisfied by 2/3 logic for protection function actuation, thus allowing for a single failure of a channel and still performing the protection function.

Control/protection interaction is addressed by the use of the Median Signal Selector that prevents a single failure of a channel providing input to the control system requiring protection function action. That is, a single failure of a channel providing input to the control system does not result in the control system initiating a condition requiring protection function action. The Median Signal Selector performs this by not selecting the channels indicating the highest or lowest steam generator levels as input to the control system.

With the transmitters located inside containment and thus possibly experiencing adverse environmental conditions (due to a feedline break), the Environmental Allowance Modifier (EAM) was devised. The EAM function (Containment Pressure (EAM) with a setpoint of < 0.5 psig) senses the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low-Low trip setpoint (Adverse) which reflects the increased transmitter uncertainties due to this environment. The EAM allows the use of a lower Steam Generator Water Level - Low-Low (EAM) trip setpoint when these conditions are not present, thus allowing more margin to trip for normal operating conditions.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. Two time delays are calculated, based on the number of steam generators indicating less than the Low-Low Level trip setpoint and the primary side power level. The magnitude of the delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low level trips.

②

INSERT 11

In the event of failure of a Steam Generator Water Level channel, it is placed in the trip condition as input to the Solid State Protection System and does not affect either the EAM or TTD setpoint calculations for the remaining operable channels. Failure of the Containment Pressure (EAM) channel to a protection set also does not affect the EAM setpoint calculations. It is then necessary for the operator to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set, through the Eagle-21 System Man-Machine-Interface (MMI) test cart. Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. Although not affecting the TTD calculation, this results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the MMI, or place the affected protection sets Steam Generator Water Level - Low-Low channel in trip.

⑤ ②

INSERT 12

There are three Steam Generator Water Level Low-Low channels per steam generator arranged in a two-out-of-three logic. These channels are arranged in four protection sets with each channel of the Containment Pressure (EAM) and RCS Loop ΔT inputting into its associated protection set.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~ ⑦

~~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.~~

14 ~~16~~. Turbine Trip ⑦

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,

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

auto stop

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.

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.

b. <u>Turbine Trip - Turbine Stop Valve Closure</u>

above ②

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 setpoint, approximately 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 limit switches indicate that the stop valves are all closed, a reactor trip is initiated. ②

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

Below the P-9 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.

15 ~~17~~. Safety Injection Input from Engineered Safety Feature Actuation System ⑦

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 not a condition of acceptability for the LOCA. However, other transients 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 solid state logic ~~relay~~ in the ESFAS. Therefore, there is no measurement signal with which to associate an LSSS. ②

There are two trains of SI input from ESFAS arranged in a one-out-of-two logic. The LCO requires two trains of SI Input from ESFAS to be OPERABLE in MODE 1 or 2. ⑥

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 ⑦

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:

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 four decades ~~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: ②

- 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~~ input to the SR drawer is shorted out driving the output of drawer to zero, ②
- 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.~~ ②

There are two Intermediate Range Neutron Flux, P-6 channels arranged in a one-out-of-two logic. 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. ⑤

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 from either the Power Range Neutron Flux, P-10, or the Turbine Impulse Pressure, P-13 interlock. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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

- Pressurizer Pressure - Low,
- Pressurizer Water Level - High,
- Reactor Coolant Flow - Low (low flow in two or more RCS loops),
- ~~RCPs Breaker Open (Two Loops),~~ ②
- Undervoltage RCPs, and
- Underfrequency RCPs.

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. 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,
- Pressurizer Water Level - High,
- Reactor Coolant Flow - Low (low flow in two or more RCS loops),
- ~~RCP Breaker Position (Two Loops),~~ ②
- Undervoltage RCPs, and
- Underfrequency RCPs.

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. <u>Power Range Neutron Flux, P-8</u>

The Power Range Neutron Flux, P-8 interlock is actuated at
35 approximately ~~48~~% power as determined by two-out-of-four NIS ②
power range detectors. The P-8 interlock automatically enables
the Reactor Coolant Flow - Low ~~and RCP Breaker Position~~
~~(Single Loop)~~ reactor trip~~s~~ on low flow in one or more RCS loops ②
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
35 greater than approximately ~~48~~% power. On decreasing power, ②
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. <u>Power Range Neutron Flux, P-9</u>

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.

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

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.

e. Power Range Neutron Flux, P-10

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,
- on increasing power, the P-10 interlock allows the operator to manually block the Power Range Neutron Flux - Low reactor trip,
- 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~~ shorts out the input to the SR drawer, driving the output of drawer to zero, ②
- the P-10 interlock provides one of the two inputs to the P-7 interlock, and
- 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.

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.

f. Turbine Impulse Pressure, P-13

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~~. Reactor Trip Breakers ⑦

This trip Function applies to the reactor trip breakers ~~RTBs~~ exclusive of individual trip mechanisms. There are two Reactor Trip Breakers arranged in a one-out-of-two logic. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of all trip breakers associated with a single RTS 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 RTS trip capability. ② ⑥

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

18 ~~20~~. <u>Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms</u> ⑦

The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each reactor trip breaker ~~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 17 ~~19~~ above. OPERABILITY of both trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal. ② ②

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these RTS 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~~. <u>Automatic Trip Logic</u> ⑦

The LCO requirement for the reactor trip breakers ~~RTBs~~ (Functions 17 and 18 ~~19 and 20~~) and Automatic Trip Logic (Function 19 ~~21~~) ensures that means are provided to interrupt the power to allow the rods to fall into the reactor core. Each reactor trip breaker ~~RTB~~ is equipped with an undervoltage coil and a shunt trip coil to trip the breaker open when needed. Each reactor trip breaker ~~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 Automatic Trip Logic cause the reactor trip breakers ~~RTBs~~ and associated bypass breakers to open and shut down the reactor. ② ⑦ ② ②

There are two RTS Automatic Trip Logic trains arranged in a one-out-of-two logic. The LCO requires two trains of RTS Automatic Trip Logic to be OPERABLE. Having two OPERABLE channels ensures that random failure of a single logic channel will not prevent reactor trip. ⑥

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

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

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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.~~
~~---~~ ③

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 setting 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, setpoint comparator trip output, contact output, 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 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.~~
~~---~~ ③

<u>A.1</u>

Condition A applies to all RTS 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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ACTIONS (continued)

B.1 and B.2

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,
- reactor trip breakers ~~RTBs~~, ②
- reactor trip breaker ~~RTB~~ Undervoltage and Shunt Trip Mechanisms, and
- Automatic Trip Logic.

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

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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). ②

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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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. ~~]~~ ④ ④

~~------------------------------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.~~
~~--~~ ③

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~~ the movable incore detectors once per 12 hours may not be necessary. ⑤

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux - Low,
- Overtemperature ΔT,

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ACTIONS (continued)

- Overpower ΔT,
- Power Range Neutron Flux - High Positive Rate,
- Power Range Neutron Flux - High Negative Rate, and ⑦
- Pressurizer Pressure - High~~,~~
- ~~SG Water Level - Low Low, and~~
- ~~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. ~~]~~ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The below text should be used for plants with installed bypass test capability:~~
~~---~~ ③

~~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.~~ ②

BASES

ACTIONS (continued)

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 to increase ~~to~~ THERMAL POWER above the P-10 setpoint. ⑤ 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 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.

BASES

ACTIONS (continued)

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. ②

reactor trip breakers

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

BASES

ACTIONS (continued)

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,
- Pressurizer Water Level - High,
- Reactor Coolant Flow – Low,
- Undervoltage RCPs, and
- 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, placing the channel in the tripped condition when above the P-8 setpoint results in a partial trip condition requiring only one additional channel in the same loop to initiate a reactor trip. For the latter trip Function, 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. 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.

BASES

ACTIONS (continued)

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. ~~]~~ ④ ④

~~-----------------------------------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.~~
~~--~~ ③

~~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.~~

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

~~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.~~ ⑦

BASES

ACTIONS (continued)

~~M.1 and M.2~~ ⑦

~~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.~~

~~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.~~

~~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.~~

~~N~~L.1 and ~~N~~L.2 ⑦

Condition ~~N~~ L 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 Low Fluid Pressure channel or three additional Turbine Stop Valve Closure channels 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 ②

~~[~~ 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. ~~]~~ ④ ④

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 8.~~
~~--~~ ③

~~O~~ M.1 and ~~O~~ M.2 ⑦

Condition ~~O~~ M 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~~ M.1) or the unit must be placed in MODE 3 within the next 6 hours. The Completion Time of 24 hours (Required Action ~~O~~ M.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. An additional 6 hours is allowed to place the unit in MODE 3. ~~The Completion Time of 6~~ Six 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. ⑦ ⑦ ⑦

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~~ reactor trip breaker also, if both the Logic test and ~~RTB~~ reactor trip breaker test are conducted within the ~~[~~4~~]~~ hour time limit. The ~~[~~4~~]~~ hour time limit is justified in Reference 8.~~]~~ ④ ② ④

~~-----------------------------------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 supports. The longer time limit for the logic train ([4] hours) is acceptable based on Reference 12.~~
~~--~~ ③

BASES

ACTIONS (continued)

N

~~P~~.1 and ~~P~~.2 ⑦

~~-----------------------------------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."~~

~~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.~~ ③

~~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 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.~~

BASES

ACTIONS (continued)

~~Use the following Bases if WCAP-14333-P-A, Rev. 1 is adopted without adopting WCAP-15376-P:~~ ③

~~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.~~

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

Condition ~~P~~ N applies to the ~~RTBs~~ reactor trip breakers in MODES 1 and 2. These actions address the train orientation of the RTS for the ~~RTBs~~ reactor trip breakers. 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. An additional 6 hours is allowed to place the unit in MODE 3. ~~The Completion Time of 6~~ Six hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. ② ⑦ ⑦

Placing the unit in MODE 3 results in Condition C entry while an ~~RTB~~ reactor trip breaker is inoperable. ②

BASES

ACTIONS (continued)

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 12 ~~13~~. ② ③

O ~~Q~~.1 and O ~~Q~~.2 ⑦

Condition O ~~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. An additional 6 hours is allowed to place the unit in MODE 3. ~~The Completion Time of 6~~ Six 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. ⑦ ⑦

P ~~R~~.1 and P ~~R~~.2 ⑦

Condition P ~~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. An additional 6 hours is allowed to place the unit in MODE 2. ~~The Completion Time of 6~~ Six hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems. ⑦ ⑦

BASES

ACTIONS (continued)

~~S~~Q.1 and ~~S~~Q.2 ⑦

Condition ~~S~~ Q applies to the ~~RTB~~ reactor trip breaker 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~~ Six 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~~ reactor trip breaker trip mechanism. ~~The~~ The Required Actions have been modified by a Note. The Notes states that the affected ~~RTB~~ reactor trip breaker shall not be bypassed while one of the diverse features is inoperable except for ~~the time required~~ up to 4 hours to perform maintenance to one of the diverse features. The allowable time for performing maintenance of the diverse features is ~~2~~ 4 hours for the reasons stated under Condition ~~P~~ N. ⑦ ② ⑦ ② ⑦ ⑦

The Completion Time of 48 hours for Required Action ~~S~~ Q.1 is reasonable considering that in this Condition there is one remaining diverse feature for the affected ~~RTB~~ reactor trip breaker, and one OPERABLE ~~RTB~~ reactor trip breaker capable of performing the safety function and given the low probability of an event occurring during this interval. INSERT 13 INSERT 14 INSERT 15 ⑦ ② ②

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.~~
~~--~~ ③

~~--------------------------------- REVIEWER'S NOTE ---------------------------------~~
~~Notes b and c are applied to the setpoint verification Surveillances for each RTS instrumentation Function in Table 3.3.1-1 unless one or more of the following exclusions apply:~~

~~1. Manual actuation circuits, automatic actuation logic circuits or instrument functions that derive input from contacts which have no associated sensor or adjustable device, e.g., limit switches, breaker position switches, manual actuation switches, float switches, proximity detectors, etc. are excluded. In addition, those permissives and interlocks that derive input from a sensor or adjustable device that is tested as part of another TS function are excluded.~~ ③

②

INSERT 13

R.1 and R.2

Condition R applies to the following reactor trip Functions:

- Steam Generator Water Level--Low-Low (Adverse), and
- Steam Generator Water Level--Low-Low (EAM)

A known inoperable channel must be placed in the tripped condition within 6 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.

In addition to placing the channel in the tripped condition it is also necessary to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set within 4 hours.

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.

②

INSERT 14

S.1, S.2, and S.3

Condition S applies to the Containment Pressure (EAM) coincident with Steam Generator Water Level--Low-Low (Adverse) reactor trip.

Failure of the Containment Pressure (EAM) channel to a protection set does not affect the EAM setpoint calculations. A known inoperable Containment Pressure channel results in the requirement to adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoints for the affected protection set to the same value as Steam Generator Water Level - Low-Low (Adverse) within 6 hours.

An alternative to adjusting the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints is to place the associated protection set's SG Water Level Low-Low channels in the tripped condition within 6 hours

If neither of the above Required Actions are completed within their associated Completion Time, then the unit must be placed in a MODE where these Functions are not required OPERABLE This requires the unit be placed in MODE 3 within 12 hours. The allowed Completion Times are reasonable to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE.

②

INSERT 15

T.1, T.2, and T.3

Condition T applies to the RCS Loop ΔT coincident with SG Water Level -- Low Low reactor trips.

Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP within 6 hours. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG level is removed.

An alternative to adjusting the threshold power level for zero seconds time delay is to place the affected protection set's SG Water Level Low-Low level channels in the tripped condition within 6 hours.

If neither of the above Required Actions can be completed within their associated Completion Times then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours. The allowed Completion Times are reasonable to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, these Functions are no longer required OPERABLE.

U.

If the Required Action is not met within the specified Completion Time of Condition R, the unit must be placed in a MODE where this Function is not required OPERABLE. Six 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

~~--~~ ③

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.

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.

~~-------------------------------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.~~

~~--~~ ③

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. 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.

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 of 12 hours 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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.2

absolute difference is greater than 2 percent

SR 3.3.1.2 compares the calorimetric heat balance calculation to the power range channel output. 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. ⑦

~~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.~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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 nonconservative 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 nonconservative 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 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.~~ ②

~~-------------------------------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~~ ③
~~---~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~

~~an absolute difference greater than 2 percent~~ ⑦

⑨

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

~~OR~~

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

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

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output. 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~~ 96 hours is allowed for performing the first Surveillance after reaching ~~[~~15%~~]~~ RTP. ④ ⑦ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT. 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.

The reactor trip breaker ~~RTB~~ test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of reactor trip breaker ~~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~~12. 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. ② ⑦

~~[The Frequency of every 62 days on a STAGGERED TEST BASIS is justified in Reference 13.~~ ⑨

~~OR~~

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

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested 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.~~ ⑨

~~OR~~

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

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.~~ ⑨

~~OR~~

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

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

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT.

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 conservative with respect to the Allowable Values specified in Table 3.3.1-1.

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.

The "as-found" ~~[~~and "as-left"~~]~~ values must also be recorded and reviewed for consistency with the assumptions of Reference 9. ④

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 reactor trip breakers ~~RTBs~~ are open and SR 3.3.1.7 is no ⑤ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

reactor trip breakers

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. ②

~~[The Frequency of 184 days is justified in Reference 9.~~

~~OR~~ ⑨

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

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

SR 3.3.1.7 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ④ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~---~~ ③

BASES

SURVEILLANCE REQUIREMENTS (continued)

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

SR 3.3.1.8

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 stating that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. ⑤ 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 ~~[~~the Frequency specified in the Surveillance Frequency Control Program ~~OR 184 days]~~ or of ⑨ the Frequencies prior to reactor startup and ~~four hours~~ after reducing ⑦ 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 ④ 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 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 ④ 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 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 ④ 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 4 hours, respectively. ~~[The Frequency of 184 days is justified in Reference 13.~~ ⑨

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ ⑨

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

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

SR 3.3.1.8 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint ④ more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance ④ procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be ④ declared inoperable.

~~--------------------------------REVIEWER'S NOTE--------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~ ③
~~---~~

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

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~~. ⑨

~~OR~~

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

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

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 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

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.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as-found" values and ~~[~~NTSP ~~or the previous test "as-left" values]~~ must be consistent with the drift allowance used in the setpoint methodology. ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[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.~~ ⑨

~~OR~~

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

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

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.

SR 3.3.1.10 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint ④ more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance ④ procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be ④ declared inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~--~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name~~ UFSAR Section 7.1.2 ~~of any document incorporated into the facility FSAR by reference]~~. ④

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. 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~~ consists of checking the discriminator voltage and adjusting if necessary. The CHANNEL CALIBRATION for the intermediate range neutron detectors consists of ~~obtaining the detector plateau or preamp discriminator curves, evaluating those~~ comparing the output of the intermediate range drawer to the secondary side calorimetric and adjusting if necessary. ~~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.~~ ⑨

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.11 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ④ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~---~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

~~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. 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.~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~

~~OR~~

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

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

~~SR 3.3.1.12 is modified by two Notes as identified in Table 3.3.1-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the [NTSP]. Where a setpoint more conservative than the [NTSP] is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the [NTSP], then the channel shall be declared inoperable.~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~---------------------------------REVIEWER'S NOTE---------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.1-1 is not required in plant specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.1-1.~~
~~---~~

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

~~SR 3.3.1.13~~

~~SR 3.3.1.13 is the performance of a COT of RTS interlocks. 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 of 18 months is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~

~~OR~~

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

~~---------------------------------REVIEWER'S NOTE---------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑦

SR 3.3.1.~~14~~12 ⑦

SR 3.3.1.~~14~~12 is the performance of a TADOT of the Manual Reactor Trip~~,~~ ~~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~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~ ⑦ 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 and manual undervoltage trip. ②

~~[The Frequency of 18 months is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~

~~OR~~ ⑨

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

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

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

SR 3.3.1.~~15~~ 13 ⑦

SR 3.3.1.~~15~~ 13 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 ④ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.~~16~~ 14 ⑦

SR 3.3.1.~~16~~ 14 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)~~ UFSAR Table 7.2.1-5. Individual component response times are not modeled in the analyses. ⑦ ②

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 UFSAR 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. ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A and/or WCAP-14036-P.~~
~~--~~ ③

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~[~~ WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. ~~15~~ 13) 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. ~~]~~ ④ ② ④ 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.

~~[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.~~ ⑨

~~OR~~

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

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

SR 3.3.1.~~16~~ 14 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. ⑦

REFERENCES

1. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."
2. UFSAR, Chapter ~~[~~7~~]~~. ② ④
3. UFSAR, Chapter ~~[~~6~~]~~. ② ④

BASES

REFERENCES (continued)

4. U FSAR, Chapter ~~[~~15~~]~~. ② ④

5. IEEE-279-1971.

6. 10 CFR 50.49.

7. ~~Plant specific setpoint methodology study~~ Calculation SQN-EEB-PL&S, Precautions, Limitations, and Setpoints for NSSS. ②

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.]~~ ②

~~12~~ 11. WCAP-10271-P-A, Supplement 2, June 1990. ②

~~13~~ 12. WCAP-15376, Rev. 0, October 2000. ②

~~14. Technical Requirements Manual, Section 15, "Response Times."~~ ②

~~15~~ 13. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995. ②

14. Letter from Siva P. Lingam (NRC) to Joseph W. Shea (TVA), "Sequoyah Nuclear Plant, Units 1 and 2 - Issuance of Amendments to Revise the Technical Specification to allow use of Areva Advanced W17 High Performance Fuel (TS-SQN-2011-07) (TAC NOS. ME6538 and ME6539), dated September 26, 2012. ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.1 BASES, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

1. NUREG 1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0 provides two sets of specification for Section 3.3.1; one for adoption "Without a Setpoint Control Program," (3.3.1.A) the other for adoption "With a Setpoint Control Program," (3.3.1.B). This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation and is removed.

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

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

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

5. Editorial changes made for enhanced clarity.

6. Proposed changes to the CTS removed details of system design and system description, including design limits stating that the removed detail will be located in the bases for the specification. These changes are made to be consistent with changes made to the Specification.

7. Changes are made to be consistent with changes made to the Specification.

8. SQN source could not be found to support this statement, therefore it is removed.

9. ISTS SR 3.3.1.1 through ISTS 3.3.16 (ITS SR 3.3.1.1 through ITS 3.1.14) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.3.1.1 through ITS 3.3.1.14 is "In accordance with the Surveillance Frequency Control Program."

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L11 an L12

SQN is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Most changes to the SQN current Technical Specifications (CTS) incorporate industry changes made to NUREG-1431 and are covered by generic No Significant Hazards Considerations. Proposed changes that are not considered included in the conversion to NUREG-1431 are outside of the generic evaluation and require separate evaluation, as is the case with these less restrictive changes (L11 and L12). The proposed change involves making the Current Technical Specifications (CTS) less restrictive. Below are the descriptions of these less restrictive changes and the determination of No Significant Hazards Considerations for conversion to NUREG-1431.

CTS Table 3.3-1 ACTION 10 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP. This action is applicable to CTS Table 3.3-1 Functional Unit 14.C (Main Steam Generator Water Level – Low-Low, RCS Loop ΔT). ITS 3.3.1 Required Action T.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

The purpose of CTS Table 3.3-1 ACTION 10 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection set's Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action T.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-1 ACTION 10 and the proposed ITS Required Action T.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

CTS Table 3.3-1 ACTION 11 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Table 3.3-1 Functional Unit 14.D (Main Steam Generator Water Level – Low-Low, Containment Pressure (EAM)). ITS 3.3.1 Required Action S.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

The purpose of CTS Table 3.3-1 ACTION 11 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time, this proposed change allows placing the affected protection set's SG Water Level -- Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action S.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-1 ACTION 11 and the proposed ITS Required Action S.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS

Tennessee Valley Authority (TVA) has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change relaxes the Required Actions for the Engineered Safety Feature Actuation System (ESFAS) Instrumentation, Auxiliary Feedwater Main Steam Generator Water Level—Low-Low, when an RCS Loop ∆T or a

Containment Pressure (EAM) channel is inoperable. Placing the affected Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels in trip uses installed equipment designed specifically for placing the channels in trip. This change will not affect the probability of an accident, because the OPERABLE Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will continue to perform the safety function the instrumentation is required to perform. The Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are not initiators of any accident sequence analyzed in the Updated Final Safety Analysis Report (UFSAR). Rather, Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are used to mitigate accidents. The consequences of an analyzed accident will not be significantly increased since the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will be maintained to ensure the availability of the required instrumentation to mitigate accidents assumed in the UFSAR. Operation in accordance with the proposed TS will ensure that sufficient Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are OPERABLE as required to support the unit's required features. Therefore, the mitigating functions supported by the Auxiliary Feedwater Main Steam Generator Water Level—Low-Low instrumentation will continue to provide the protection assumed by the accident analysis. The integrity of fission product barriers, plant configuration, and operating procedures as described in the UFSAR will not be affected by the proposed changes. Thus, the consequences of previously analyzed accidents will not be significantly increased by implementing these changes.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No

The proposed change relaxes the Required Actions for the ESFAS Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels. The remaining Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are required to be OPERABLE to support the associated unit's required features. This change will not physically alter the plant (no new or different type of equipment will be installed). The proposed changes will maintain the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels to ensure the availability of the equipment required to mitigate accidents assumed in the UFSAR.

Therefore, operation of the facility in accordance with this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

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

Response: No.

The proposed change relaxes the Required Actions for the ESFAS Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels. The remaining Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are required to be OPERABLE to support the associated unit's required features. The margin of safety is not affected by this change because the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will be maintained to ensure the availability of the required Auxiliary Feedwater Main Steam Generator Water Level—Low-Low instrumentation to shutdown the reactor and maintain it in a safe shutdown condition after an abnormal operational transient or postulated design basis accident.

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

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

10 CFR 50.92 EVALUATION
FOR
MORE RESTRICTIVE CHANGE M24

SQN is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Most changes to the SQN current Technical Specifications (CTS) incorporate industry changes made to NUREG-1431 and are covered by generic No Significant Hazards Considerations. Proposed changes that are not considered included in the conversion to NUREG-1431 are outside of the generic evaluation and require separate evaluation, as is the case with this more restrictive change (M24). The proposed change involves making the Current Technical Specifications (CTS) more restrictive. Below are the descriptions of this more restrictive change and the determination of No Significant Hazards Considerations for conversion to NUREG-1431.

The Reactor Nominal Trip Setpoint (NTSP) Limits specified in CTS Table 2.2-1 are the values at which the Reactor Trips are set for each functional unit. The NTSPs have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their safety limits during normal operation and design basis anticipated operational occurrences. Operation with a trip set less conservative than its NTSP but within its specified Allowable Value (AV) is acceptable on the basis that the difference between each NTSP and the AV is equal to or less than the rack allowance assumed for each trip in the safety analyses.

Current Technical Specifications (CTS) Table 2.2-1 for Functional Unit 16 (Underfrequency-Reactor Coolant Pumps) lists the NTSP as 56.0 Hz – each bus, and the AV as ≥ 55.9 Hz – each bus. The proposed change to Improved Technical Specification (ITS) Table 3.3.1-1 for Function 12 (Underfrequency RCPs) lists the NTSP as 57.0 Hz and the AV as ≥ 56.3 Hz. This changes the CTS by increasing the NTSP and the AV for the Underfrequency Reactor Coolant Pump (RCP) reactor trip.

The purpose of the Underfrequency RCP reactor trip is to ensure 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. TVA has determined that to provide adequate protection changes to the Underfrequency RCP Nominal Trip Setpoint and the Allowable Value are needed. This change was previously proposed in SQN license amendment request TVA-SQN-TS-02-01, Revision 1 (ADAMS Accession No. 042430467) but later withdrawn in TVA-SQN-TS-02-01, Revision 2 (ADAMS Accession No. ML061990303) pending resolution of issues with TSTF-493. In Revision 2 TVA stated that a new TS amendment request would be submitted to the NRC once TSTF-493 receives NRC approval. As TSTF-493 has been approved by the NRC and is being adopted under this conversion, TVA is proposing to change the setpoints to those proposed in the previous submittal. This change is acceptable because the revised Allowable Value and Nominal Trip Setpoint continue to provide assurance that the safety limit for the underfrequency reactor trip function is not impacted. In addition, this change ensures instrument uncertainties have been included in the as-found tolerance calculations in a manner that is acceptable and the surveillance Note requirements also ensure that there will be a reasonable expectation that these instruments will perform their safety function if required. This change is designated as more restrictive because more stringent acceptance requirements are being applied in the ITS than were applied in the CTS.

Tennessee Valley Authority (TVA) has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change affects the setpoint limits and the nominal setpoint for the RCP underfrequency reactor trip. Once the setpoint is exceeded, the RCP underfrequency reactor trip performs its design function in the same manner as before the proposed change. Maintenance and operation of the instrumentation is unchanged, except for a change in CTS setpoint, thus there is no increase in the likelihood of a malfunction of the instrument. The revision of the RCP underfrequency has been evaluated and the results are documented in approved calculations. These calculations verify that the revised values are acceptable in accordance with appropriate calculation methodologies and that they will continue to support the accident analysis. Although this proposed change revised the settings listed in CTS, these revisions will not require changes to the instrumentation settings currently being used or the methods for maintaining them.

Therefore, the proposed revision of these values will not significantly increase the probability or consequences of an accident.

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

Response: No

The revised setpoints and the proposed operability limits will continue to provide acceptable initiation of safety functions for the mitigation of postulated accidents as required by the design basis. The primary function of the reactor protection system is to initiate accident mitigation functions. These functions are not considered initiators of postulated accidents. The proposed changes do not create the possibility of a new or different kind of accident because the design functions are not altered and the proposed values meet the accident analysis requirements for accident mitigation.

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

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

Response: No.

The NTSP and AV revisions proposed in this request were evaluated and found to be acceptable without impact to the safety limits required for the associated functions. Plant systems will continue to be actuated for those plant conditions that require the initiation of accident mitigation functions. The margin of safety is not reduced because the proposed conservative changes to the AV and NTSP will not change design functions and the initiation of accident mitigation functions for appropriate plant conditions is ensured. Operational margin is reduced by increasing the NTSP and AV, maintaining the margin of safety.

Therefore, the proposed change does not involve a significant reduction in the margin of safety.

ATTACHMENT 2

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

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

ITS

Table 3.3.2-1

A01

ITS 3.3.2

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

ITS ACTION

LA01

REQUIRED

A02

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION
19. Safety Injection Input from ESF	2	1	2	1, 2	12
20. Reactor Trip Breakers					
A. Startup and Power Operation	2	1	2	1, 2	12, 15
B. Shutdown	2	1	2	3*,4* and 5*	16
21. Automatic Trip Logic					
A. Startup and Power Operation	2	1	2	1, 2	12
B. Shutdown	2	1	2	3*,4* and 5*	16
22. Reactor Trip System Interlocks					
A. Intermediate Range Neutron Flux, P-6	2	1	2	2, and*	8a
B. Power Range Neutron Flux, P-7	4	2	3	1	8b
C. Power Range Neutron Flux, P-8	4	2	3	1	8c
D. Power Range Neutron Flux, P-10	4	2	3	1, 2	8d
E. Turbine Impulse Chamber Pressure, P-13	2	1	2	1	8b
F. Power Range Neutron Flux, P-9	4	2	3	1	8e
8.a G. Reactor Trip P-4	~~2~~	~~1~~	~~2~~	1, 2, ~~and*~~	14 G

See ITS 3.3.1

3

M01

1 per train, 2 trains

A03

LA01

A01

TABLE 3.3-1 (Continued)

TABLE NOTATION

M01

~~*With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.~~

** Above the P-9 (Power Range Neutron Flux) interlock.

##Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

See ITS 3.3.1

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

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

A01

TABLE 3.3-1 (Continued)

See ITS 3.3.1

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

ACTION 12 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

L01

ACTION 13 - Deleted

Add proposed Required Action G.1

Add proposed Required Action G.2.2

M01

LCO 3.3.2
ACTION G

ACTION 14 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within ~~6~~ 54 hours.

See ITS 3.3.1

ACTION 15 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to operable status within 48 hours or declare the breaker inoperable and apply ACTION 12. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status.

ACTION 16 - With the number of OPERABLE channels one less than the minimum channels operable requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

ACTION 17 - With the number of OPERABLE channels two less than the minimum channels OPERABLE requirement and with the THERMAL POWER level above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

A01

TABLE 4.3-1 (Continued)

M02

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE IS REQUIRED
15.	Deleted				
16.	Undervoltage - Reactor Coolant Pumps	N.A.	R	Q	1
17.	Underfrequency - Reactor Coolant Pumps	N.A.	R	Q	1
18.	Turbine Trip				
	A. Low Fluid Oil Pressure	N.A.	N.A.	(1) (12)	1**
	B. Turbine Stop Valve Closure	N.A.	N.A.	(1) (12)	1**
19.	Safety Injection Input from ESF	N.A.	N.A.	R	1, 2
20.	Reactor Trip Breaker	N.A.	N.A.	M(5) and S/U(1)	1, 2, and *
21.	Automatic Trip Logic	N.A.	N.A.	M(5)	1, 2, and *
22.	Reactor Trip System Interlocks				
	A. Intermediate Range Neutron Flux, P-6	N.A.	R	N.A.	2, and *
	B. Power Range Neutron Flux, P-7	N.A.	N.A.	N.A.	1
	C. Power Range Neutron Flux, P-8	N.A.	R	N.A.	1
	D. Power Range Neutron Flux, P-10	N.A.	R	N.A.	1, 2
	E. Turbine Impulse Chamber Pressure, P-13	N.A.	R	N.A.	1
	F. Power Range Neutron Flux, P-9	N.A.	R	N.A.	1
	G. Reactor Trip, P-4	N.A.	N.A.	R	1, 2, and *
23.	Reactor Trip Bypass Breaker	N.A.	N.A.	M(10)R(11)	1, 2, and *

See ITS 3.3.1

M03

Once per reactor trip breaker cycle

A04

Table 3.3.2-1 8.a

SR 3.3.2.10

See ITS 3.3.1

TABLE 4.3-1 (Continued)

NOTATION

* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

A04

** - Above the P-9 (Power Range Neutron Flux) interlock.

(1) - If not performed in previous 31 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is $\geq$ 15% RTP.

(4) - Deleted.

(5) - Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.

See ITS 3.3.1

(6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

(9) - The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.

(10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(11) - Automatic and manual undervoltage trip.

(12) - Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.2

Table 3.3.2-1 Footnotes (b) and (c)

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

Applicability

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Add proposed ACTIONS Note — A05

Table 3.3.2-1 Footnote (b)

ACTION A

Table 3.3.2-1 Footnote (c)

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

ACTION A

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

Surveillance Requirements Table Note

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2. — M02

SR 3.3.2.2 for Functions 1.b and 4.b

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. ~~The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~ — L02 — A06

SR 3.3.2.9

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.~~

~~18 months on a STAGGERED TEST BASIS~~ — A07

In accordance with the Surveillance Frequency Control Program — LA02

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	1. SAFETY INJECTION, ~~TURBINE TRIP AND FEEDWATER ISOLATION~~ A08						
1.a	a. Manual Initiation	~~2~~	~~1~~	2	1, 2, 3, 4	20	B
1.b	b. Automatic Actuation Logic and Actuation Relays M04	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~ Add proposed ACTION C L03	C
1.c	c. Containment Pressure-High	~~3~~	~~2~~	~~2~~ 3 A02	1, 2, 3	17	D
1.d	d. Pressurizer Pressure-Low	~~3~~	~~2~~	~~2~~ 3	1, 2, 3#	17	D
	e. Deleted						

LA01

ITS

A01

ITS 3.3.2

Table 3.3.2-1

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1.e	f. Steam Line Pressure-Low	~~3/steam line~~	~~2/steam line in any steam line~~	~~2~~ 3/steam line (A02)	1, 2, 3#	17 D
	2. CONTAINMENT SPRAY					
2.a	a. Manual	~~2~~	~~1**~~ (LA03)	~~2~~ 2 per train, 2 trains (A03)	1, 2, 3, 4	20 B
2.b	b. Automatic Actuation Logic and Actuation Relays (M04)	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~ C (Add proposed ACTION C, L03)
2.c	c. Containment Pressure--High-High	~~4~~	~~2~~	~~3~~ 4 (A02)	1, 2, 3	18 E
	3. CONTAINMENT ISOLATION					
3.a	a. Phase "A" Isolation					
3.a.(1)	1) Manual	~~2~~	~~1~~	2	1, 2, 3, 4	20 B
3.a.(3)	2) From Safety Injection Automatic Actuation Logic	~~2~~	~~1~~	~~2~~	~~1, 2, 3, 4~~	~~15~~

Refer to Function 1 (Safety Injection) for all initiation functions and requirements

A09

INSERT 1

M05

LA03

~~**Two switches must be operated simultaneously for actuation.~~

Table 3.3.2-1

M05

INSERT 1

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
3.a.(2)	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA

ITS

A01

ITS 3.3.2

Table 3.3.2-1

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION	
3.b.	b. Phase "B" Isolation							A03
3.b.(1)	1) Manual	~~2~~	~~1**~~	~~2~~ 2 per train, 2 trains	1, 2, 3, 4	20	B	M04, LA03
3.b.(2)	2) Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~ Add proposed ACTION C	C	L03
3.b.(3)	3) Containment Pressure-High-High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	18	E	A02
	c. Containment Ventilation Isolation	2	1	2	1, 2, 3, 4	19		
	1) Manual							
	2) Automatic Isolation Logic	2	1	2	1, 2, 3, 4	15		See ITS 3.3.6
	3) Containment Purge Air Exhaust Monitor Radioactivity-High	2	1	1	1, 2, 3, 4	19		

LA03

~~**Two switches must be operated simultaneously for actuation.~~

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

A10

M04

L04

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	4. STEAM LINE ISOLATION						
4.a	a. Manual and Actuation Relays	~~1/steam line~~	~~1/steam line~~	1/~~operating~~ steam line	1, 2, 3 (j)	25	F
4.b	b. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3	23	H
4.c	c. Containment Pressure--High-High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	18	E
4.d.(1)	d. Steam Line Pressure- Low	~~3/steam line~~	~~2/steam line in any steam line~~	~~2~~ 3/steam line	1, 2, $3^{\#}$	17	D
4.d.(2)	e. Negative Steam Line Pressure Rate-High	~~3/steam line~~	~~2/steam line in any steam lines~~	~~2~~ 3/steam line	$3^{\#\#}$	17	D

A02

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01 A11 A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
	5. TURBINE TRIP & FEEDWATER ISOLATION			3 per SG (A02)	(k) (L05)	
5.b	a. Steam Generator Water Level—High-High (P-14)	~~3/loop~~	~~2/loop in any operating loop~~	~~2/loop in each operating loop~~	1, 2, 3	17 D
5.a	b. Automatic Actuation Logic and Actuation Relays (M04) (A08)	~~2~~	~~1~~	2	1, 2, 3	23 H
	INSERT 2					A10
	6. AUXILIARY FEEDWATER					
	~~a. Manual Initiation~~ (A12)	~~2~~	~~1~~	~~2~~	~~1, 2, 3~~	~~24~~ (A12)
6.a	b. Automatic Actuation Logic and Actuation Relays (M04)	~~2~~	~~1~~	2	1, 2, 3	23 H
6.b	c. Main Stm. Gen. Water Level—Low-Low					
	i. ~~Start Motor-Driven Pumps~~ (LA04)			3 (A02)		
6.b.(1)	a. Steam Generator Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~	1, 2, 3	36 I
6.b.(2)	b. Steam Gen Water Level--Low-Low (EAM)	~~3/Stm. Gen~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~.	1, 2, 3	36 I (A10)
6.b.(1) 6.b.(2)	c. RCS Loop ΔT	~~4(1/loop)~~	~~2~~	~~3~~ 4 (A02)	1, 2, 3	37 K
6.b.(1)	d. Containment Pressure (EAM)	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	38 J

A08

INSERT 2

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
5.c	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	ii. ~~Start Turbine Driven Pump~~ LA04						
6.b.(1)	a. Steam Generator Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any 2 Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~	1, 2, 3	36	I
6.b.(2)	b. Steam Generator Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any 2 Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~	1, 2, 3	36	I
6.b.(1) 6.b.(2)	c. RCS Loop ΔT	~~4(1/loop)~~	~~2~~	~~3~~	1, 2, 3	37	K
6.b.(1)	d. Containment Pressure (EAM)	~~4~~	~~2~~	~~3~~	1, 2, 3	38	J
6.c	d. S.I. Start Motor-Driven Pumps and Turbine Driven Pump	See 1 above (all S.I. initiating functions and requirements)					

3 A02

4 A02

A10

ITS

A01

ITS 3.3.2

Table 3.3.2-1

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6.d.	e. Loss of Power Start					
6.d.(1)	1. Voltage Sensors	~~3/shutdown board**~~	~~2/shutdown board**~~	3/shutdown board**	1, 2, 3	35 L,M
6.d.(2)	2. Load Shed Timer	~~2/shutdown board**~~	~~1/shutdown board**~~	1/shutdown board**	1, 2, 3	35 M
6.e	f. Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump	~~1/pump~~	~~1/pump~~	1/pump(a)	1, 2(b)	20 N
6.f	g. Auxiliary Feedwater Suction Pressure-Low	~~3/pump~~	~~2/pump~~	3/pump	1, 2, 3	21 O
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays					
6.g.(1)	1. Motor-Driven Pump	~~1/pump~~	~~1/pump~~	1/pump	1, 2, 3	21 O
6.g.(2)	2. Turbine-Driven Pump	~~2/pump~~	~~1/pump~~	2/pump	1, 2, 3	21 O

Footnote (j) **Unit 1 shutdown boards only

L06

Required Action N Note (a) One channel may be inoperable ~~during Mode 1~~ for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service.

Footnote (k) (b) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

ITS

ITS 3.3.2

A01

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

Table 3.3.2-1	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION	
								LA01 A02
	7. This Functional Unit has been deleted.							
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS							
8.b.(1) 8.b.(2)	a. Pressurizer Pressure-P-11/Not P-11	~~3~~	~~2~~	~~2~~ 3	1, 2, 3	22a	Q	M06
	b. Deleted							
5.b	~~c. Steam Generator Level P-14~~	~~3/loop~~	~~2/loop any loop~~	~~3/loop~~	~~1, 2~~	~~22c~~		A11

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP					
7.b.	a. RWST Level - Low	~~4~~	~~2~~	~~3~~ 4	1, 2, 3, 4	18 P
	COINCIDENT WITH Containment Sump Level - High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3, 4	18 P
	AND Safety Injection	(See 1 above for Safety Injection Requirements)				
7.a.	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3, 4	15 S

A02

LA01

M04

SEQUOYAH - UNIT 1

3/4 3-21a

December 31, 1987
Amendment No. 29, 63

A01

TABLE 3.3-3 (Continued)

INSERT 3 A13

TABLE NOTATION

INSERT 4 A14

Table 3.3.2-1 Footnote (a) and Footnote (f)

\# ~~Trip function may be bypassed in this MODE below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint~~.

INSERT 5 A15

Table 3.3.2-1 Footnote (g)

\#\# ~~Trip function automatically blocked above P-11 and may be blocked below P11 when Safety Injection on Steam Line Pressure-Low is not blocked~~.

(e) Except when all MSIV's are closed. L04

(i) Except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. L05

ACTION STATEMENTS

ACTION S

ACTION 15 - With the number of OPERABLE Channels one less than the Total Number of Channels, be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.

ACTION S Note

ACTION 16 - Deleted.

ACTION D

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

72 L07

a. The inoperable channel is placed in the tripped condition within ~~6~~ hours.

12 L08

b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

Add proposed Required Action D.2.1 and D.2.2 M07

ACTION E
ACTION P

72 for ACTION E, otherwise 6 L09

ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition within ~~6~~ hours and the Minimum Channels OPERABLE requirement is met; one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1.

12 for ACTION E, otherwise 4 L10

Add proposed Required Action E.2.1 and E.2.2 M08

ACTION 19 - With less than the Minimum Channels OPERABLE, operation may continue provided the containment purge supply and exhaust valves are maintained closed.

See ITS 3.3.6

ACTION B
ACTION N

ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

A16

Add proposed Required Action P.2.1 and P.2.2 M09

September 14, 2006
Amendment No. 63, 141, 168, 182, 188, 202, 207, 213, 301, 311

Table 3.3.2-1

Ⓐ13

INSERT 3

Footnote (a) Above the P-11 (Pressurizer Pressure) interlock.

Ⓐ14

INSERT 4

Footnote (f) When Steam Line Isolation, Steam Line Pressure, Negative Rate–High is blocked.

Ⓐ15

INSERT 5

Footnote (g) When Steam Line Isolation on Steam Line Pressure, Low is blocked.

TABLE 3.3-3 (Continued)

ACTION O — ACTION 21 - With less than the Minimum Number of Channels OPERABLE, declare the associated auxiliary feedwater pump inoperable, and comply with the ACTION requirements of Specification 3.7.1.2.

Add proposed Required Action Q.1 M10

ACTION Q
ACTION D — ACTION 22 - With less than the Minimum Number of Channels OPERABLE, ~~declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions~~. ~~Functions to be evaluated are:~~

Add proposed Required Actions Q.2.1, and Q.2.2 A17

ACTION Q
~~a.~~ ~~Safety Injection~~
~~- Pressurizer Pressure~~
~~- Steam Line Pressure~~
~~- Negative Steam Line Pressure Rate~~

~~b.~~ ~~Deleted~~

ACTION D
~~c.~~ ~~Turbine Trip~~
~~- Steam Generator Level High-High~~
~~Feedwater Isolation~~
~~- Steam Generator Level High-High~~

restore to OPERABLE status within 24 hours or, L11

ACTION H — ACTION 23 - With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within ~~6~~ 30 hours and in at least HOT SHUTDOWN within ~~the following 6~~ 36 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.2.1.1.

~~ACTION 24~~ - ~~With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.~~ A12

ACTION F — ACTION 25 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 34 - Deleted

TABLE 3.3-3 (Continued)

ACTION L ACTION 35 - a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channel.

ACTION M b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channels.

ACTION I ACTION 36 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for multiple affected steam generators (T_M) within 4 hours.

c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

Add proposed ACTION R M11

ACTION K ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

Add proposed Required Action K.3.1 and K.3.2 M12

ACTION J ACTION 38 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

Add proposed Required Action J.3.1 and J.3.2 M13

Add proposed Required Action K.2 L12

Add proposed Required Action J.2 L13

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	1. SAFETY INJECTION~~, TURBINE TRIP AND FEEDWATER ISOLATION~~ A08		
1.a	a. Manual Initiation	Not Applicable	Not Applicable
1.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable
1.c	c. Containment Pressure—High	1.54 psig	≤ 1.6 psig
1.d	d. Pressurizer Pressure--Low	1870 psig	≥ 1864.8 psig
	e. Deleted		
1.e	f. Steam Line Pressure—Low	600 psig steam line pressure (Note 1)	≥ 592.2 psig steam line pressure (Note 1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	2. CONTAINMENT SPRAY		
2.a	a. Manual Initiation	Not Applicable	Not Applicable
2.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable
2.c	c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
	3. CONTAINMENT ISOLATION		
3.a	a. Phase "A" Isolation		
3.a.(1)	1. Manual	Not Applicable	Not Applicable
3.a.(2)	2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable
3.b.	b. Phase "B" Isolation		
3.b.(1)	1. Manua1	Not Applicable	Not Applicable
3.b.(2)	2. Automatic Actuation Logic	Not Applicable	Not Applicable
3.b.(3)	3. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
	c. Containment Ventilation Isolation		
	1. Manual	Not Applicable	Not Applicable
	2. Automatic Isolation Logic	Not Applicable	Not Applicable

See ITS 3.3.6

ITS

Table 3.3.2-1

A01

ITS 3.3.2

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

ITS	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES	
	3. Containment Purge Air Exhaust Monitor Radioactivity-High	≤ 8.5 x 10^{-3} μCi/cc	≤ 8.5 x 10^{-3} μCi/cc	See ITS 3.3.6
	4. STEAM LINE ISOLATION			
4.a	a. Manual	Not Applicable	Not Applicable	
4.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable	
4.c	c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig	
4.d.(1)	d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥ 592.2 psig steam line pressure (Note 1)	
4.d.(2)	e. Negative Steam Line Pressure Rate—High	100.0 psi (Note 2)	≤ 107.8 psi (Note 2)	
	5. TURBINE TRIP AND FEEDWATER ISOLATION			LA05
5.b	a. Steam Generator Water level-- High-High (P-14)	81% ~~of narrow range instrument span each steam generator~~	≤ 81.7% ~~of narrow range instrument span each steam generator~~	A11
5.a	b. Automatic Actuation Logic	N.A.	N.A.	

Table 3.3.2-1

A01

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	6. AUXILIARY FEEDWATER		
	~~a. Manual~~	~~Not Applicable~~	~~Not Applicable~~ (A12)
6.a	b. Automatic Actuation Logic	Not Applicable	Not Applicable
	c. Main Steam Generator Water Level--Low-Low		
6.b.(1) 6.b.(2)	i. RCS Loop ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input ≤ nominal trip setpoint +2.5% RTP
6.b.(1)	Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥14.4% of narrow range instrument span
	and		
6.b.(1)	Containment Pressure-EAM	0.5 psig	≤ 0.6 psig
	or		
6.b.(2)	Steam Generator Water Level--Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow instrument span
	with		
6.b.(1) 6.b.(2)	A time delay (T_S) if one Steam Generator is affected	T_S (Note 5, Table 2.2-1)	≤ (1.01) T_S (Note 5, Table 2.2-1)
	or		
6.b.(1) 6.b.(2)	A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5, Table 2.2-1)	≤ (1.01) T_M (Note 5, Table 2.2-1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
6.b.(1) 6.b.(2)	ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
6.b.(1)	Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
	and		
6.b.(1)	Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
	or		
6.b.(2)	Steam Generator Water Level-- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument span
6.c	d. S.I.	See 1 above (all SI Setpoints)	
6.d.	e. Loss of Power Start		
6.d.(1)	1. Voltage Sensors	Refer to Function 1 of Table 3.3-14 for setpoints and allowable values.	
6.d.(2)	2. Load Shed Timer		
6.e	f. Trip of Main Feedwater Pumps	N.A.	N.A.
6.f	g. Auxiliary Feedwater Suction Pressure-Low	3.21 psig (motor driven pump)	≥ 2.44 psig (motor driven pump)
		13.9 psig (turbine driven (pump)	≥ 12 psig (turbine driven pump)
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	≤ 4.4 seconds and ≥ 3.6 seconds (motor driven pump)
		5.5 seconds (turbine driven pump)	≤ 6.05 seconds and ≥ 4.95 seconds (turbine driven pump)

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	7. This Functional Unit has been deleted.		
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
	a. Pressurizer Pressure		
8.b.(1)	1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1970 psig	≤ 1975.2 psig
8.b.(2)	2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1962 psig	≥ 1956.8 psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS (Continued)		
	b. Deleted		
	c. Deleted		
5.b	~~d. Steam Generator Level Turbine Trip, Feedwater Isolation P-14~~	~~(See 5. above)~~	
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP		
7.b.	a. RWST Level - Low	130" from tank base	≤ 132.71” and ≥ 127.29” from tank base
	COINCIDENT WITH		
	Containment Sump Level - High	30" above elev. 680'	≤ 31.68” and ≥ 28.32” above elev. 680’
	AND		
	Safety Injection	(See 1 above for all Safety Injection Setpoints/Allowable Values)	
7.a.	b. Automatic Actuation Logic	N.A.	N.A.

A11

Footnote (d) Note 1: Time constants utilized in the lead-lag controller for Steam Pressure - Low are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.

Footnote (h) Note 2: Time constant utilized in the rate-lag controller for Negative Steam Line Pressure Rate - High is $\tau \geq 50$ seconds.

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A01

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A01

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Table 3.3.2-1

A01

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES IN WHICH SURVEILLANCE REQUIRED~~
	1. SAFETY INJECTION ~~AND FEEDWATER ISOLATION~~				
1.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
1.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
1.c	c. Containment Pressure-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
1.d	d. Pressurizer Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	e. Deleted				
1.e	f. Steam Line Pressure—Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	2. CONTAINMENT SPRAY				
2.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
2.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
2.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~

A08

A04

L14 ~~184 days~~

~~184 days~~

~~92 days on a STAGGERED TEST BASES~~ L15

In accordance with the Surveillance Frequency Control Program LA02

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.3 at a frequency of ~~92 days on a STAGGERED TEST BASES~~. M04

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.5 at a frequency of ~~every 18 months~~. M04

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	CONTAINMENT ISOLATION				
3.a	a. Phase "A" Isolation				
3.a.(1)	1) Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
3.a.(3)	2) From Safety Injection Automatic Actuation Logic	N.A.	N.A.	M(1)	~~1, 2, 3, 4~~
3.b.	b. Phase "B" Isolation				
3.b.(1)	1) Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
3.b.(2)	2) Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
3.b.(3)	3) Containment Pressure-- High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	c. Containment Ventilation Isolation				
	1) Manual	N.A.	N.A.	R	1, 2, 3, 4
	2) Automatic Isolation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
	3) Containment Purge Air Exhaust Monitor Radio-activity-High	S	R	Q	1, 2, 3, 4

M02

L15

~~92 days on a STAGGERED TEST BASES~~

A09

A09

A04

~~184 days~~

L14

In accordance with the Surveillance Frequency Control Program

LA02

See ITS 3.3.6

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	4. STEAM LINE ISOLATION				
4.a	a. Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3~~
4.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~
4.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
4.d.(1)	d. Steam Line Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
4.d.(2)	e. Negative Steam Line Pressure Rate--High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~3~~
	5. TURBINE TRIP AND FEEDWATER ISOLATION A11				
5.b	a. Steam Generator Water Level--High-High (P-14)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~184 days~~ L14	~~1, 2, 3~~
5.a	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~
	6. AUXILIARY FEEDWATER				
	~~a. Manual~~ A12	N.A.	N.A.	~~R~~ A12	~~1, 2, 3~~
6.a	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~

A04

~~92 days on a STAGGERED TEST BASES~~ L15

In accordance with the Surveillance Frequency Control Program LA02

A01

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

M02

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE REQUIRED~~
6.b	c. Main Steam Generator Water Level--Low-Low				
6.b.(1)	1. Steam Generator Water Level--Low-Low (Adverse)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(2)	2. Steam Generator Water Level--Low-Low (EAM)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(1) 6.b.(2)	3. RCS Loop ΔT	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(1)	4. Containment Pressure (EAM)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.c	d. S.I.	See 1 above (all SI surveillance requirements)			
6.d.	e. Loss of Power Start				
6.d.(1)	1. Voltage Sensors	N.A.	~~R~~ SR 3.3.2.8	~~M~~ SR 3.3.2.6	~~1, 2, 3~~
6.d.(2)	2. Load Shed Timer	N.A.	~~R~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~
6.e	f. Trip of Main Feedwater Pumps	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2~~
6.f	g. Auxiliary Feedwater Suction Pressure-Low	N.A.	~~R~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays	N.A.	~~R~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~
	7. This Functional Unit has been deleted. -				

A04

A04

In accordance with the Surveillance Frequency Control Program

LA02

September 14, 2006
Amendment No. 29, 129, 141, 182, 188, 207, 253, 311

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

M02

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE REQUIRED~~	
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS					A04
8.b.(1) 8.b.(2)	a. Pressurizer Pressure, P-11/Not P-11	N.A.	~~R(2)~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~	
			In accordance with the Surveillance Frequency Control Program			LA02
	b. Deleted					
5.b	~~c. Steam Generator Level, P-14~~	~~N.A.~~	~~R(2)~~	~~N.A.~~	~~1, 2~~	A11
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP					
7.b.	a. RSWT Level - Low COINCIDENT WITH Containment Sump Level - High AND Safety Injection	~~S~~ SR 3.3.2.1 ~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8 ~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~Q~~ SR 3.3.2.4	~~1, 2, 3, 4~~ ~~1, 2, 3, 4~~	A04
		(See 1 above for all Safety Injection Surveillance Requirements)				
7.a.	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~	A04

In accordance with the Surveillance Frequency Control Program

LA02

A01

TABLE 4 .3-2 (Continued)

TABLE NOTATION

In accordance with the Surveillance Frequency Control Program

LA02

~~92 days on a STAGGERED TEST BASIS~~

L15

SR 3.3.2.2 (1) Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.

~~(2) The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~

L01

Add proposed SR 3.3.2.6 Note

Add proposed SR 3.3.2.7 Note

Add proposed SR 3.3.2.10 Note

A18

Add proposed SR 3.3.2.8 Note

A19

Add proposed SR 3.3.2.9 Note

A20

ITS

Table 3.3.2-1

A01

ITS 3.3.2

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

ITS ACTION

LA01

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION
	C. Power Range Neutron Flux, P-8	4	2	3	1	8c
	D. Power Range Neutron Flux, P-10	4	2	3	1, 2	8d
	E. Turbine Impulse Chamber Pressure, P-13	2	1	2	1	8b
	F. Power Range Neutron Flux, P-9	4	2	3	1	8e
8.a	G. Reactor Trip P-4	~~2~~	~~1~~	~~2~~ 1 per train, 2 trains	1, 2, ~~and*~~ 3	14 G

See ITS 3.3.1

M01

A03

LA01

TABLE 3.3-1 (Continued)

TABLE NOTATION

M01

~~* With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.~~

** Above the P-9 (Power Range Neutron Flux) interlock.

\#\# Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

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

See ITS 3.3.1

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

A01

TABLE 3.3-1 (Continued)

ACTION 10 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

See ITS 3.3.1

ACTION 12 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

L01

ACTION 13 - Deleted

Add proposed Required Action G.1

Add proposed Required Action G.2.2

M01

LCO 3.3.2 ACTION G

ACTION 14 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within ~~6~~ 54 hours.

ACTION 15 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to operable status within 48 hours or declare the breaker inoperable and apply ACTION 12. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status.

ACTION 16 - With the number of OPERABLE channels one less than the minimum channels operable requirement, restore the inoperable channel to operable status within 48 hours or open the reactor trip breakers within the next hour.

See ITS 3.3.1

ACTION 17 - With the number of OPERABLE channels two less than the minimum channels OPERABLE requirement and with the THERMAL POWER level above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

A01

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	15.	Deleted					
	16.	Undervoltage - Reactor Coolant Pumps	N.A.	R	Q	1	
	17.	Underfrequency - Reactor Coolant Pumps	N.A.	R	Q	1	
	18.	Turbine Trip					
		A. Low Fluid Oil Pressure	N.A.	N.A.	(1) (12)	1**	|
		B. Turbine Stop Valve Closure	N.A.	N.A.	(1) (12)	1**	|
	19.	Safety Injection Input from ESF	N.A.	N.A.	R	1, 2	
	20.	Reactor Trip Breaker	N.A.	N.A.	M(5) and S/U(1)	1, 2, and *	See ITS 3.3.1
	21.	Automatic Trip Logic	N.A.	N.A.	M(5)	1, 2, and *	
	22.	Reactor Trip System Interlocks					
		A. Intermediate Range Neutron Flux, P-6	N.A.	R	N.A.	2, and *	
		B. Power Range Neutron Flux, P-7	N.A.	N.A.	N.A.	1	
		C. Power Range Neutron Flux, P-8	N.A.	R	N.A.	1	
		D. Power Range Neutron Flux, P-10	N.A.	R	N.A.	1, 2	
		E. Turbine Impulse Chamber Pressure, P-13	N.A.	R	N.A.	1	
		F. Power Range Neutron Flux, P-9	N.A.	R	N.A.	1	
Table 3.3.2-1 8.a		G. Reactor Trip, P-4	N.A.	N.A.	~~R~~ SR 3.3.2.10 Once per reactor trip breaker cycle	1, 2, and *	M03 A07
	23.	Reactor Trip Bypass Breaker	N.A.	N.A.	M(10)R(11)	1, 2, and *	See ITS 3.3.1

April 2, 2008

A01

Table 4.3-1 (Continued)

NOTATION

*	-	With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
**	-	Above the P-9 (Power Range Neutron Flux) interlock.
(1)	-	If not performed in previous 31 days.
(2)	-	Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.
(3)	-	Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is $\geq$ 15% RTP.
(4)	-	Deleted.
(5)	-	Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.
(6)	-	Neutron detectors may be excluded from CHANNEL CALIBRATION.
(7)	-	Below P-6 (Block of Source Range Reactor Trip) setpoint.
(8)	-	Deleted.
(9)	-	The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.
(10)	-	Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.
(11)	-	Automatic and manual undervoltage trip.
(12)	-	Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.

A04

See ITS 3.3.1

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.2
Table 3.3.2-1 Footnotes (b) and (c)

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Add proposed ACTIONS Note A05

Table 3.3.2-1 Footnote (b)
ACTION A
Table 3.3.2-1 Footnote (c)

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

ACTION A

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

Surveillance Requirements Table Note

4.3.2.1.1 Each ESFAS instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2. M02

SR 3.3.2.2 for Functions 1.b and 4.b

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. ~~The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation~~. L02 A06

SR 3.3.2.9

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.~~

~~18 months on a staggered test basis~~ A07

In accordance with the Surveillance Frequency Control Program LA02

ITS

ITS 3.3.2

A01

Table 3.3.2-1

TABLE 3.3-3

ITS ACTION

LA01

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	1. SAFETY INJECTION, ~~TURBINE TRIP AND FEEDWATER ISOLATION~~						
1.a	a. Manual Initiation	~~2~~	~~1~~	2	1, 2, 3, 4	20	B
1.b	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~ Add proposed ACTION C	C
1.c	c. Containment Pressure-High	~~3~~	~~2~~	~~2~~ 3	1, 2, 3	17	D
1.d	d. Pressurizer Pressure-Low	~~3~~	~~2~~	~~2~~ 3	1, 2, 3#	17	D
	e. Deleted						

A08

L03

A02

M04

LA01

ITS　　　A01　　　ITS 3.3.2

Table 3.3.2-1

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
1.e	f. Steam Line Pressure- Low	~~3/steam line~~	~~2/steam line in any steam line~~	~~2~~ 3/steam line	1, 2, 3#	17	D
	2. CONTAINMENT SPRAY						
2.a	a. Manual and Actuation Relays	~~2~~	~~1**~~	~~2~~ 2 per train, 2 trains	1, 2, 3, 4	20	B
2.b	b. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~	C
2.c	c. Containment Pressure--High-High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	18	E
	3. CONTAINMENT ISOLATION						
3.a	a. Phase "A" Isolation						
3.a.(1)	1) Manual	~~2~~	~~1~~	2	1, 2, 3, 4	20	B
3.a.(3)	2) From Safety Injection Automatic Actuation Logic	~~2~~	~~1~~	~~2~~	~~1, 2, 3, 4~~	~~15~~	

LA01

A02

LA03

A03

M04

L03 Add proposed ACTION C

A02

A09 Refer to Function 1 (Safety Injection) for all initiation functions and requirements

M05 INSERT 1

LA03

~~** Two switches must be operated simultaneously for actuation.~~

M05

INSERT 1

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
3.a.(2)	(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

ITS

Table 3.3.2-1

A01

ITS 3.3.2

ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

REQUIRED

A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	3. CONTAINMENT ISOLATION						
3.b.	b. Phase "B" Isolation						
3.b.(1)	1) Manual	~~2~~	~~1**~~	~~2~~	1, 2, 3, 4	20	B
3.b.(2)	2) Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	~~15~~	C
3.b.(3)	3) Containment Pressure-High-High	~~4~~	~~2~~	~~3~~	1, 2, 3	18	E
	c. Containment Ventilation Isolation						
	1) Manual	2	1	2	1, 2, 3, 4	19	
	2) Automatic Isolation Logic	2	1	2	1, 2, 3, 4	15	
	3) Containment Purge Air Exhaust Monitor Radioactivity-High	2	1	1	1, 2, 3, 4	19	

A03: 2 per train, 2 trains

M04: and Actuation Relays

LA03

L03: Add proposed ACTION C

A02: 4

See ITS 3.3.6

LA03

~~** Two switches must be operated simultaneously for actuation~~.

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 3.3-3 (Continued)

ITS ACTION

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

REQUIRED

A02

A10

M04

and Actuation Relays

(j)

L04

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	4. STEAM LINE ISOLATION						
4.a	a. Manual	~~1/steam line~~	~~1/steam line~~	1/~~operating~~ steam line	1, 2, 3	25	F
4.b	b. Automatic Actuation Logic	~~2~~	~~1~~	2	1, 2, 3	23	H
4.c	c. Containment Pressure-- High-High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3	18	E
4.d.(1)	d. Steam Line Pressure- Low	~~3/steam line~~	~~2/steam line in any steam line~~	~~2~~ 3/steam line	1,2,3#	17	D
4.d.(2)	e. Negative Steam Line Pressure Rate-High	~~3/steam line~~	~~2/steam line in any steam lines~~	~~2~~ 3/steam line	3###	17	D

A02

ITS
Table 3.3.2-1

A01

ITS 3.3.2
ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01 A02 A02 L05

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	5. TURBINE TRIP & FEEDWATER ISOLATION						
5.b	a. Steam Generator Water Level—High-High (P-14) A11	~~3/loop~~	~~2/loop in any operating loop~~	~~2/loop in each operating loop~~ 3 per SG A10	1, 2, 3 (k)	17	D
5.a	M04 b. Automatic Actuation Logic and Actuation Relays A08 INSERT 2	~~2~~	~~1~~	2	1, 2, 3 (k)	23	H
	6. AUXILIARY FEEDWATER						
	~~a. Manual Initiation~~ A12	~~2~~	~~1~~	~~2~~	~~1, 2, 3~~	~~24~~	A12
6.a	b. Automatic Actuation Logic and Actuation Relays M04	~~2~~	~~1~~	2	1, 2, 3	23	H
6.b	M04 c. Main Steam Generator Water Level--Low-Low						
	i. ~~Start Motor-Driven Pumps~~ LA04						
6.b.(1)	a. Steam Gen. Water Level--Low-Low (Adverse)	~~3/Stm. Gen~~.	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~. 3 A02	1, 2, 3	36	I
6.b.(2)	b. Steam Gen. Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~/Stm. Gen. ~~in each operating Stm. Gen.~~ A10	1, 2, 3	36	I
6.b.(1) 6.b.(2)	c. RCS Loop ΔT	~~4(1/loop~~)	~~2~~	~~3~~ 4 A02	1, 2, 3	37	K

April 11, 2005
Amendment Nos. 33, 55, 116, 132, 158, 290

A08

INSERT 2

		FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
5.c	c.	Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					

ITS

ITS 3.3.2

Table 3.3.2-1

A01

TABLE 3.3-3 (Continued)

ITS ACTION

LA01

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

A02

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
6.b.(1)	d. Containment Pressure (EAM)	4	~~2~~	~~3~~ 4	1, 2, 3	38	J
	ii. ~~Start Turbine Driven Pump~~ LA04						
6.b.(1)	a. Steam Gen. Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any 2 operating Stm. Gen.~~	~~2~~ 3/Stm. Gen. ~~in each operating Stm. Gen.~~	1, 2, 3	36	I
6.b.(2)	b. Steam Gen. Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any 2 operating Stm. Gen.~~	~~2~~ 3/Stm. Gen. ~~in each operating Stm. Gen.~~	1, 2, 3	36	I
6.b.(1) 6.b.(2)	c. RCS Loop ΔT	~~4(1/loop)~~	~~2~~	~~3~~ 4	1, 2, 3	37	K
6.b.(1)	d. Containment Pressure (EAM)	4	~~2~~	~~3~~ 4	1, 2, 3	38	J
6.c	d. S. I. Start Motor-Driven Pumps and Turbine Driven Pump	See 1 above (all S.I. initiating functions and requirements)					

A02

A02

A02

A10

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 3.3-3 (Continued)

ITS ACTION

LA01

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

REQUIRED

A02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
6.d.	e. Loss of Power Start						
6.d.(1)	1. Voltage Sensors	~~3/shutdown board**~~	~~2/shutdown board**~~	3/shutdown board**	1, 2, 3	35	L.M
6.d.(2)	2. Load Shed Timer	~~2/shutdown board**~~	~~1/shutdown board**~~	1/shutdown board**	1, 2, 3	35	M
6.e	f. Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump	~~1/pump~~	~~1/pump~~	1/pump(a)	1, 2(b)	20	N
6.f	g. Auxiliary Feedwater Suction Pressure-Low	~~3/pump~~	~~2/pump~~	3/pump	1, 2, 3	21	O
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays						
6.g.(1)	1. Motor-Driven Pump	~~1/pump~~	~~1/pump~~	1/pump	1, 2, 3	21	O
6.g.(2)	2. Turbine-Driven Pump	~~2/pump~~	~~1/pump~~	2/pump	1, 2, 3	21	O

Footnote (j) ** Unit 2 Shutdown Boards Only

L06

Required Action N Note (a) One channel may be inoperable ~~during Mode 1~~ for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service.

Footnote (k) (b) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

A01

Table 3.3.2-1

TABLE 3.3-3 (Continued)

ITS ACTION

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01

REQUIRED

A02

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. This specification has been deleted.					

Table 3.3.2-1

TABLE 3.3-3 (Continued)

ITS ACTION

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION	
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS							LA01 A02
8.b.(1) 8.b.(2)	a. Pressurizer Pressure - P-11/Not P-11	~~3~~	~~2~~	~~2~~ 3	1, 2, 3	22a	Q	M06
	b. Deleted							
5.b	~~c. Steam Generator Level P-14~~	~~3/loop~~	~~2/loop any loop~~	~~3/loop~~	~~1, 2~~	~~22c~~		A11
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP							LA01
7.b.	a. RWST Level - Low	~~4~~	~~2~~	~~3~~ 4	1, 2, 3, 4	18	P	A02
	COINCIDENT WITH Containment Sump Level - High	~~4~~	~~2~~	~~3~~ 4	1, 2, 3, 4	18	P	
	AND Safety Injection	(See 1 above for Safety Injection Requirements)						LA01
7.a.	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3, 4	15	S	M04

ITS A01 ITS 3.3.2

TABLE 3.3-3 (Continued)

INSERT 3 A13

TABLE NOTATION

INSERT 4 A14

Table 3.3.2-1 Footnote (a) and Footnote (f)

\# ~~Trip function may be bypassed in this MODE below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint.~~

A15

INSERT 5

Table 3.3.2-1 Footnote (g)

\## ~~Trip function automatically blocked above P-11 and may be blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.~~

L04

(j) Except when all MSIV's are closed.

L05

(k) Except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

ACTION STATEMENTS

ACTION S

ACTION 15 - With the number of OPERABLE Channels one less than the Total Number of Channels, be in HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.

ACTION S Note

ACTION 16 - Deleted.

ACTION D

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

72 L07

a. The inoperable channel is placed in the tripped condition within ~~6~~ hours.

12 L08

b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

M07

Add proposed Required Action D.2.1 and D.2.2

ACTION E
ACTION P

72 for ACTION E, otherwise 6

L09

ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels operation may proceed provided the inoperable channel is placed in the bypassed condition within ~~6~~ hours and the Minimum Channels OPERABLE requirement is met; one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1.

L10

12 for ACTION E, otherwise 4

M08

Add proposed Required Action E.2.1 and E.2.2

ACTION 19 - With less than the Minimum Channels OPERABLE, operation may continue provided the containment purge supply and exhaust valves are maintained closed.

See ITS 3.3.6

ACTION B
ACTION N

ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

A16

Add proposed Required Action P.2.1 and P.2.2

M09

Ⓐ13

INSERT 3

Footnote (a) Above the P-11 (Pressurizer Pressure) interlock.

Ⓐ14

INSERT 4

Footnote (f) When Steam Line Isolation, Steam Line Pressure, Negative Rate–High is blocked.

Ⓐ15

INSERT 5

Footnote (g) When Steam Line Isolation on Steam Line Pressure, Low is blocked.

TABLE 3.3-3 (Continued)

ACTION O

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, declare the associated auxiliary feedwater pump inoperable, and comply with the ACTION requirements of Specification 3.7.1.2.

Add proposed Required Action Q.1

M10

ACTION Q
ACTION D

ACTION 22 - With less than the Minimum Number of Channels OPERABLE, ~~declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions~~. ~~Functions to be evaluated are:~~

Add proposed Required Actions Q.2.1, and Q.2.2

A17

ACTION Q

- ~~a.~~ ~~Safety Injection~~
  - ~~Pressurizer Pressure~~
  - ~~Steam Line Pressure~~
  - ~~Negative Steam Line Pressure Rate~~
- ~~b.~~ ~~Deleted~~
- ~~c.~~ ~~Turbine Trip~~
  - ~~Steam Generator Level High-High~~

ACTION D

- ~~Feedwater Isolation~~
  - ~~Steam Generator Level High-High~~

restore to OPERABLE status within 24 hours or,

L11

ACTION H

ACTION 23 - With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within ~~6~~ hours and in at least HOT SHUTDOWN within ~~the following 6 hours~~; however, one channel may be bypassed for up to ~~2~~ hours for surveillance testing per Specification 4.3.2.1.1.

30

36

4

~~ACTION 24 -~~ ~~With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.~~

A12

ACTION F

ACTION 25 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 34 - Deleted

A01

TABLE 3.3-3 (Continued)

ACTION L ACTION 35 - a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channel. |

ACTION M b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channels. |

ACTION I ACTION 36 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. For the affected protection set, the Trip Time Delay for one affected steam generator (TS) is adjusted to match the Trip Time Delay for multiple affected steam generators (TM) within 4 hours.

c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

Add proposed ACTION R M11

ACTION K ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

Add proposed Required Action K.3.1 and K.3.2 M12

ACTION J ACTION 38 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

Add proposed Required Action J.3.1 and J.3.2 M13

Add proposed Required Action K.2 L12

Add proposed Required Action J.2 L13

A01

Table 3.3.2-1

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	1. SAFETY INJECTION, ~~TURBINE TRIP AND FEEDWATER ISOLATION~~ A08		
1.a	a. Manual Initiation	Not Applicable	Not Applicable
1.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable
1.c	c. Containment Pressure--High	1.54 psig	≤1.6 psig
1.d	d. Pressurizer Pressure--Low	1870 psig	≥1864.8 psig
	e. Deleted		
1.e	f. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥592.2 psig steam line pressure (Note 1)

A01

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	2. CONTAINMENT SPRAY		
2.a	a. Manual Initiation	Not Applicable	Not Applicable
2.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable
2.c	c. Containment Pressure--High-High	2.81 psig	≤2.9 psig
	3. CONTAINMENT ISOLATION		
3.a	a. Phase "A" Isolation		
3.a.(1)	1. Manual	Not Applicable	Not Applicable
3.a.(2)	2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable
3.b.	b. Phase "B" Isolation		
3.b.(1)	1. Manual	Not Applicable	Not Applicable
3.b.(2)	2. Automatic Actuation Logic	Not Applicable	Not Applicable
3.b.(3)	3. Containment Pressure--High-High	2.81 psig	≤2.9 psig
	c. Containment Ventilation Isolation		
	1. Manual	Not Applicable	Not Applicable
	2. Automatic Isolation Logic	Not Applicable	Not Applicable

See ITS 3.3.6

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

ITS	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES	
	3. Containment Purge Air Exhaust Monitor Radioactivity - High	$\leq 8.5 \times 10^{-3}$ µCi/cc	$\leq 8.5 \times 10^{-3}$ µCi/cc	See ITS 3.3.6
	4. STEAM LINE ISOLATION			
4.a	a. Manual	Not Applicable	Not Applicable	
4.b	b. Automatic Actuation Logic	Not Applicable	Not Applicable	
4.c	c. Containment Pressure--High-High	2.81 psig	≤2.9 psig	
4.d.(1)	d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥592.2 psig steam line pressure (Note 1)	
4.d.(2)	e. Negative Steam Line Pressure Rate--High	100.0 psi (Note 2)	≤107.8 psi (Note 2)	
	5. TURBINE TRIP AND FEEDWATER ISOLATION			
5.b	a. Steam Generator Water level --High-High (P-14)	81% ~~of narrow range instrument span each steam generator~~	≤81.7% ~~of narrow range instrument span each steam generator~~	LA05 A11
5.a	b. Automatic Actuation Logic	N.A.	N.A.	

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	6. AUXILIARY FEEDWATER		
	~~a. Manual~~	~~Not Applicable~~	~~Not Applicable~~
6.a	b. Automatic Actuation Logic	Not Applicable	Not Applicable
	c. Main Steam Generator Water Level--Low-Low		
6.b.(1) 6.b.(2)	i. RCS Loop ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input ≤ nominal trip setpoint +2.5% RTP
6.b.(1)	Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥14.4% of narrow range instrument span
	and		
6.b.(1)	Containment Pressure-EAM	0.5 psig	≤ 0.6 psig
	or		
6.b.(2)	Steam Generator Water Level--Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow instrument span
	with		
6.b.(1) 6.b.(2)	A time delay (T_S) if one Steam Generator is affected	T_S (Note 5, Table 2.2-1)	≤ (1.01) T_S (Note 5, Table 2.2-1)
	or		
6.b.(1) 6.b.(2)	A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5, Table 2.2-1)	≤ (1.01) T_M (Note 5, Table 2.2-1)

A12

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
6.b.(1) 6.b.(2)	ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
6.b.(1)	Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
	and		
6.b.(1)	Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
	or		
6.b.(2)	Steam Generator Water Level-- Low-Low (EAM)	10.7% of narrow range instrument span	≥10.1% of narrow range instrument span
6.c	d. S.I.	See 1 above (all SI Setpoints)	
6.d.	e. Loss of Power Start		
6.d.(1)	1. Voltage Sensors	Refer to Function 1 of Table 3.3-14 for setpoints and allowable values.	
6.d.(2)	2. Load Shed Timer		
6.e	f. Trip of Main Feedwater Pumps	N.A.	N.A.
6.f	g. Auxiliary Feedwater Suction Pressure-Low	3.21 psig (motor driven pump)	≥ 2.44 psig (motor driven pump)
		13.9 psig (turbine driven (pump)	≥ 12 psig (turbine driven pump)
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	≤ 4.4 seconds and ≥ 3.6 seconds (motor driven pump)
		5.5 seconds (turbine driven pump)	≤ 6.05 seconds and ≥ 4.95 seconds (turbine driven pump)

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	7. This Specification has been deleted.		
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
	a. Pressurizer Pressure		
8.b.(1)	1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1970 psig	≤1975.2 psig
8.b.(2)	2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1962 psig	≥1956.8 psig

A01

Table 3.3.2-1

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

	FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS (Continued)		
	b. Deleted		
	c. Deleted		
5.b	~~d. Steam Generator Level Turbine Trip, Feedwater Isolation P-14~~	~~(See 5. above)~~	A11
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP		
7.b.	a. RWST Level - Low	130" from tank base	≤ 132.71” and ≥ 127.29” from tank base
	COINCIDENT WITH		
	Containment Sump Level - High	30" above elev. 680'	≤ 31.68” and ≥ 28.32” above elev. 680’
	AND		
	Safety Injection	(See 1 above for all Safety Injection Setpoints/Allowable Valves)	
7.a.	b. Automatic Actuation Logic	N.A.	N.A.

Footnote (d) Note 1: Time constants utilized in the lead-lag controller for Steam Pressure-Low are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.

Footnote (h) Note 2: Time constant utilized in the rate-lag controller for Negative Steam Line Pressure Rate-High is $\tau_1 \geq 50$ seconds.

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A01

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Table 3.3.2-1

A01

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

A04

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	1. SAFETY INJECTION ~~AND FEEDWATER ISOLATION~~ A08				
1.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
1.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
1.c	c. Containment Pressure-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
1.d	d. Pressurizer Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	e. Deleted				
1.e	f. Steam Line Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	2. CONTAINMENT SPRAY				
2.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
2.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
2.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~

L14 ~~184 days~~

~~184 days~~

~~92 days on a staggered test bases~~ L15

In accordance with the Surveillance Frequency Control Program LA02

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.3 at a frequency of ~~92 days, on a STAGGERED TEST BASES~~. M04

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.5 at a frequency of ~~every 18 months~~. M04

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

M02

L15

~~92 days on a staggered test bases~~

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	3. CONTAINMENT ISOLATION				
	a. Phase "A" Isolation				
3.a.(1)	1) Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
3.a.(3)	2) From Safety Injection Automatic Actuation Logic	N.A.	N.A.	M(1)	~~1, 2, 3, 4~~
	b. Phase "B" Isolation				
3.b.(1)	1) Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
3.b.(2)	2) Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
3.b.(3)	3) Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	c. Containment Ventilation Isolation				
	1) Manual	N.A.	N.A.	R	1, 2, 3, 4
	2) Automatic Isolation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
	3) Containment Purge Air Exhaust Monitor Radioactivity-High	S	R	Q	1, 2, 3, 4

A04

A09

A09

~~184 days~~

In accordance with the Surveillance Frequency Control Program

L14

LA02

See ITS 3.3.6

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
	4. STEAM LINE ISOLATION				
4.a	a. Manual	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3~~
4.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~
4.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
4.d.(1)	d. Steam Line Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
4.d.(2)	e. Negative Steam Line Pressure Rate--High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~3~~
	5. TURBINE TRIP AND FEEDWATER ISOLATION (A11)				
5.b	a. Steam Generator Water Level--High-High (P-14)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~184 days~~ L14	~~1, 2, 3~~
5.a	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~
	6. AUXILIARY FEEDWATER				
	~~a.~~ ~~Manual~~ A12	N.A.	N.A.	~~R~~ A12	~~1, 2, 3~~
6.a	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3~~

M02

A04

~~92 days on a staggered test bases~~ L15

In accordance with the Surveillance Frequency Control Program LA02

A01

Table 3.3.2-1

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

A04

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
	c. Main Steam Generator Water Level--Low-Low				
6.b.(1)	1. Steam Generator Water Level--Low-Low (Adverse)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(2)	2. Steam Generator Water Level--Low-Low (EAM)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(1) 6.b.(2)	3. RCS Loop ΔT	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.b.(1)	4. Containment Pressure (EAM)	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
6.c	d. S.I.	See 1 above (all SI surveillance requirements)			
	e. Loss of Power Start				
6.d.(1)	1. Voltage Sensors	N.A.	~~R~~ SR 3.3.2.8	~~M~~ SR 3.3.2.6	~~1, 2, 3~~
6.d.(2)	2. Load Shed Timer	N.A.	~~R~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~
6.e	f. Trip of Main Feedwater Pumps	N.A.	N.A.	~~R~~ SR 3.3.2.7 SR 3.3.2.7	~~1, 2~~
6.f	g. Auxiliary Feedwater Suction Pressure-Low	N.A.	~~R~~ SR 3.3.2.8	N.A	~~1, 2, 3~~
6.g	h. Auxiliary Feedwater Suction Transfer Time Delays	N.A.	~~R~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~

A04

7. This Specification has been deleted.

In accordance with the Surveillance Frequency Control Program

LA02

ITS

Table 3.3.2-1

A01

ITS 3.3.2

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS				
8.b.(1) 8.b.(2)	a. Pressurizer Pressure, P-11/Not P-11	N.A.	~~R(2)~~ SR 3.3.2.8	N.A.	~~1, 2, 3~~
	b. Deleted				
5.b	~~c. Steam Generator Level, P-14~~	~~N.A.~~	~~R(2)~~	~~N.A.~~	~~1, 2~~
	9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP				
7.b.	a. RSWT Level - Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3, 4~~
	COINCIDENT WITH Containment Sump Level - High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3, 4~~
	AND Safety Injection	(See 1 above for all Safety Injection Surveillance Requirements)			
7.a.	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~

A04

In accordance with the Surveillance Frequency Control Program

LA02

A11

A04

A04

In accordance with the Surveillance Frequency Control Program

LA02

September 14, 2006
Amendment No. 39, 55, 116, 132, 174, 180, 197, 300

A01

TABLE 4.3-2 (Continued)
TABLE NOTATION

In accordance with the Surveillance Frequency Control Program

LA02

~~92 days on a STAGGERED TEST BASIS~~

L15

SR 3.3.2.2 (1) Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.

~~(2) The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~

L01

Add proposed SR 3.3.2.6 Note

Add proposed SR 3.3.2.7 Note

Add proposed SR 3.3.2.10 Note

A18

Add proposed SR 3.3.2.8 Note

A19

Add proposed SR 3.3.2.9 Note

A20

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

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS Table 3.3-1 and Table 3.3-3 specify the "TOTAL NO. OF CHANNELS" and the "MINIMUM CHANNELS OPERABLE" associated with each ESFAS Functional Unit. For CTS Table 3.3-3 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3), 4.c, 4.d, 4,e, 5.a, 6.c.i.a, 6.c.i.b, 6.c.i.c, 6.c.i.d, 6.c.ii.a, 6.c.ii.b, 6.c.ii.c, 6.c.ii.d, and 9.a, the number of channels listed in the "TOTAL NO. OF CHANNELS" column is greater than that listed in the "MINIMUM OPERABLE CHANNELS" column. CTS Table 3.3-3 ACTIONS 17, 18, 20, 36, 37, and 38, specify the actions to take with the number of channels OPERABLE one less than required by the "TOTAL NO. OF CHANNELS" column. ITS LCO 3.3.2 requires the ESFAS instrumentation for each Function in ITS Table 3.3.2-1 to be OPERABLE, which includes only one column titled "REQUIRED CHANNELS," and ITS 3.3.2 ACTION A specifies the action to take under the condition where one or more Functions have one or more "Required Channels" or trains inoperable. This changes the CTS by changing the title of the "MINIMUM CHANNELS OPERABLE" column to "REQUIRED CHANNELS," and matching the number of channels listed in the "REQUIRED CHANNELS" column to the number listed in either the "TOTAL NO. OF CHANNELS" column or "MINIMUM CHANNELS OPERABLE" column where action is required if the number of OPERABLE channels falls below the number specified.

This change is acceptable because the requirements for when actions must be taken remain unchanged. The "REQUIRED CHANNELS" column reflects the current requirements in the CTS ACTIONS for when actions are required to be taken. For CTS Table 3.3-3 Functional Units 6.e.1, 6.g, 6.h.1, and 6.h.2, action is required when the number of OPERABLE channels falls below the "MINIMUM CHANNELS OPERABLE" column, the number entered into the ITS "REQUIRED CHANNELS" column. For CTS Table 3.3-3 Functional Units 1.a, 1.b, 1.c, 1.d, 1.f, 2.b, 2.c, 3.a.1), 3.b.2), 3.b.3), 4.a, 4.b, 4.c, 4.d, 4.e, 5.a, 5.b, 6.b, 6.c.i.a, 6.c.i.b, 6.c.i.c, 6.c.i.d, 6.c.ii.a, 6.c.ii.b, 6.c.ii.c, 6.c.ii.d, 6.e.1, 6.f, and 9.a, action is required when the number of OPERABLE channels falls below the "TOTAL NO. OF CHANNELS" column, the number entered into the ITS "REQUIRED CHANNELS" column. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip System Interlocks – Reactor Trip P-4), CTS Table 3.3-3 Functional Unit 2.a (Containment Spray – Manual), and CTS Table 3.3-3 Functional Unit 3.b.1) (Containment Isolation, Phase "B"

Isolation, Manual) the number of channels is specified as 2 channels. In ITS Table 3.3.2-1 Function 2.a (Containment Spray – Manual Initiation), Function 3.b.(1) (Containment Isolation, Phase "B" Isolation, Manual Initiation) and Function 8.a (ESFAS Interlocks – Reactor Trip, P-4) the corresponding ITS Function Required Channels are specified in terms of "trains". ITS Function 2.a (Containment Spray – Manual Initiation) and Function 3.b.(1) (Containment Isolation, Phase "B" Isolation, Manual Initiation) Required Channels are listed as "2 per train, 2 trains"; while Function 8.a (ESFAS Interlocks – Reactor Trip, P-4) Required Channels is listed as "1 per train, 2 trains". This changes the CTS by identifying the ESFAS Function Train A and B relationship required OPERABLE in the ITS.

CTS Functional Units Reactor Trip, P-4; Containment Spray – Manual; and Containment Isolation, Phase "B" Isolation, Manual are related to the ESFAS actuation trains and not individual instrument channels. The proposed change is acceptable because it is consistent with the ESFAS design and more accurately describes the affected Function. In addition, the proposed change revises the label used to describe the Function and does not change the CTS OPERABILITY requirements for the affected Function. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table 4.3-1 and Table 4.3-2 provide a column designating the MODES that each Surveillance is required to be met. ITS Table 3.3.2-1 does not provide this specific column but includes this information in the Applicable MODES or other Specified Conditions column. This changes the CTS by combining the information in the CTS Table 4.3-1 and Table 4.3-2 columns specifically stating when a Surveillance is required to be met with the CTS Table 3.3-1 and Table 3.3-3 column stating the Applicable MODES the instruments are required to be OPERABLE into one table in ITS.

CTS 4.0.1 states that Surveillance Requirements shall be met during the MODES or other specified conditions in the Applicability for individual Limiting Condition for Operation, unless otherwise stated in the individual Surveillance Requirement. ITS SR 3.0.1 states that surveillance requirements (SRs) shall be met during the MODES or other specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. For these Functional Units the MODES for which the surveillance must be met from CTS Table 4.3-1 and CTS Table 4.3-2 are the same as that in the "Applicable MODES" column from CTS Table 3.3-1 and CTS Table 3.3-3. Any changes to the "Applicable MODES" from CTS to ITS are covered by DOCs identified in CTS Tables 3.3-1 and 3.3-3. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 CTS 3.3.2.1 [Unit 1] ACTION, CTS 3.3.2 [Unit 2] ACTION and CTS Table 3.3-3 provide the compensatory actions to take when Engineered Safety Feature Actuation System (ESFAS) instrumentation is inoperable. ITS 3.3.2 ACTIONS similarly provide the compensatory actions for inoperable ESFAS Instrumentation. ITS 3.3.2 ACTIONS are modified by a Note that allows separate Condition entry for each Function. In addition, due to the manner in which the Required Channel's description modifies ITS Functions 1.e, 2.a, 3.b.(1), 4.a, 4.d.(1), 4.d.(2), 5.b, 6.b.(1), 6.b.(2), 6.d.(1), 6.d.(2), 6.e, 6.f, 6.g.(1), 6.g.(2), and 8.a, separate Condition entry is allowed within a Function as follows: Function 1.e (Safety Injection, Steam Line Pressure - Low) on a per steam line basis; Function 2.a (Containment Spray, Manual Initiation) on a per train basis; Function 3.b.(1) (Containment Isolation, Phase B Isolation, Manual Initiation) on a per train basis; Function 4.a (Steam Line Isolation, Manual Initiation) on a per steam line basis; Function 4.d.(1) (Steam Line Isolation, Steam Line Pressure, Low) on a per steam line basis; Function 4.d.(2) (Steam Line Isolation, Steam Line Pressure, Negative Rate - High) on a per steam line basis; Function 5.b (Turbine Trip and Feedwater Isolation, SG Water Level - High High (P-14)) on a per SG basis; Function 6.b.(1) (Auxiliary Feedwater, SG Water Level - Low Low (Adverse)) on a per SG basis; Function 6.b.(2) (Auxiliary Feedwater, SG Water Level - Low Low (EAM)) on a per SG basis; Function 6.d.(1) (Auxiliary Feedwater, Loss of Offsite Power, Voltage Sensors) on a per shutdown board basis; Function 6.d.(2) (Auxiliary Feedwater, Loss of Offsite Power, Load Shed Timer) on a per shutdown board basis; Function 6.e (Trip of all Main Feedwater Pumps) on a per pump basis; Function 6.f (Auxiliary Feedwater Pump Suction Transfer on Suction Pressure-Low) on a per pump basis; Function 6.g.(1) (Auxiliary Feedwater Suction Transfer Time Delays, Motor-Driven Pump) on a per pump basis; Function 6.g.(2) (Auxiliary Feedwater Suction Transfer Time Delays, Turbine-Driven Pump) on a per pump basis; and Function 8.a (ESFAS Interlock, P-4) on a per train basis. This changes the CTS by providing a specific allowance to enter the ACTION for each inoperable ESFAS instrumentation Function and for certain Functions on a steam line, steam generator, shutdown board, pump or train basis.

This change is acceptable because it clearly states the current requirement. The CTS considers each ESFAS instrumentation Function to be separate and independent from the others. In addition, the channels associated with Functions 1.e, 2.a, 3.b.(1), 4.a, 4.d.(1), 4.d.(2), 5.b, 6.b.(1), 6.b.(2), 6.d.(1), 6.d.(2), 6.e, 6.f, 6.g.(1), 6.g.(2), and 8.a are allowed separate Condition entry on the specified basis (i.e., per steam line, train, loop, SG, shutdown board, pump, or train). This separate condition entry is allowed because the channels associated with each steam line, train, loop, SG, shutdown board, pump, or train, as applicable, will provide the associated ESFAS actuation 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.

A06 CTS 4.3.2.1.3 requires verification that the ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function is within limits. Sequoyah License Amendment 190 and 182, for Unit 1 and Unit 2 respectively, relocated the ESFAS response time limits to the UFSAR (ADAMS Accession No. ML013300393). UFSAR Table 7.3.1-4 contains these limits listing the information in two columns, "Initiating Signal and Function," and "Response Time in Seconds." In UFSAR Table 7.3.1-4, "Manual" initiating signal and associated functions are listed as not having an applicable response time limit and actuation logic is not listed in the "Initiation Signal and Function" column. The Initiating Signals listed in UFSAR Table 7.3.1-4 are; Containment Pressure – High, Pressurizer Pressure – Low, Negative Steam Line Pressure Rate – High, Steam Line Pressure – Low, Containment Pressure -- High – High, Steam Generator

Water Level -- High-High, Main Steam Generator Water Level -- Low-Low, Station Blackout, Trip of Main Feedwater Pumps, Loss of Power, and RWST Level-Low Coincident with Containment Sump Level - High and Safety Injection. ITS Table 3.3.2-1 requires the performance of SR 3.3.2.9, "Verify ESFAS RESPONSE TIMES are within limits," for Functions 1.c (Safety Injection - Containment Pressure - High), 1.d (Safety Injection - Pressurizer Pressure – Low), 1.e (Safety Injection - Steam Line Pressure Low), 2.c (Containment Spray – Containment Pressure High-High), 3.b.(3) (Containment Isolation - Containment Pressure High-High), 4.c (Steam Line Isolation - Containment Pressure High-High), 4.d.(1) (Steam Line Isolation – Steam Line Pressure Low), 4.d.(2) (Steam Line Isolation – Negative Rate - High), 5.b (Turbine Trip and Feedwater Isolation – SG Water Level High-High (P-14)), 6.b.(1) (Auxiliary Feedwater - SG Water Level Low Low – Adverse), 6.b.(2) (Auxiliary Feedwater - SG Water Level Low Low – EAM), 6.d.(1) (Auxiliary Feedwater, Loss of Power – Voltage Sensors), 6.d.(2) (Auxiliary Feedwater, Loss of Power – Load Shed Timer), 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps), and 7.b (Automatic Switchover to Containment Sump, RWST Level - Low Coincident with Safety Injection and Coincident with Containment Sump Level – High). As with the CTS, "Manual" and "Automatic Actuation Logic and Actuation Relays" Functions are excluded from RESPONSE TIME TESTING. This changes the CTS by specifically stating which Functions the ESFAS RESPONSE TIME testing is required.

The purpose of CTS 4.3.2.1.3 is to ensure that the actuation response times are less than or equal to the maximum values assumed in the accident analysis. UFSAR Table 7.3.1-4 specifies response times for those ESFAS Functions assumed in the SQN safety analyses. This change is acceptable because ITS 3.3.2, Table 3.3.2-1 continues to require ESFAS RESPONSE TIME testing (ITS SR 3.3.2.9) for those Functions listed in UFSAR Table 7.3.1-4. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 CTS 4.3.2.1.3 states, in part, that the ESFAS RESPONSE TIME of each ESFAS function shall be demonstrated to be within its limit at least once per 18 months. The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-3 ITS SR 3.3.2.9 requires the verification of ESFAS RESPONSE TIMES every 18 months "on a STAGGERED TEST BASIS." The ITS definition of STAGGERED TEST BASIS is consistent with the CTS testing Frequency. This changes the CTS by utilizing the ITS definition of STAGGERED TEST BASIS.

This change is acceptable because the requirements for RESPONSE TIME testing for the ESFAS channels remain unchanged. The ITS definition of STAGGERED TEST BASIS and its application in this requirement do not change the current testing frequency requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

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

A08 CTS Tables 3.3-3, 3.3-4, and 4.3-2 Functional Unit 1 provides the ESFAS actuation Functions associated with Safety Injection, Turbine Trip, and Feedwater Isolation. ITS Table 3.3.2-1 Function 5 lists "Safety Injection" as one of the supporting Functions for Turbine Trip and Feedwater Isolation. This changes the CTS by moving the details of the support function from the Safety Injection Functional Unit (CTS Functional Unit 1) to the Turbine Trip and Feedwater Isolation Function (ITS Function 5).

CTS presents the relationship between actuation signals/circuitry and Functional Units by listing the Functional Units of Turbine Trip and Feedwater Isolation with the Safety Injection Functional Unit actuation signals and logic. ITS presents this relationship by listing "Safety Injection" under Function 5 (Turbine Trip and Feedwater Isolation) and referring to ITS Function 1 for all initiation functions and requirements. This change is acceptable because the support/supported relationship is maintained, only the manner in which the relationship is presented is changed. This change is designated as administrative because it does not result in technical changes to the CTS.

A09 CTS Tables 3.3-3, 3.3-4, and 4.3-2 provide specific requirements, including Applicability, number of channels, ACTIONS, and Surveillances, for Functional Unit 3.a.2) which is the Functional Unit for the Safety Injection (SI) signals generated from ESFAS to the Phase A Containment Isolation. ITS Table 3.3.2-1 Function 3.a.(3), which is the same Function, also provides the specific requirements for the SI Input from ESFAS. However, the ITS only refers to the requirements of ITS Table 3.3.2-1 Function 1 for the requirements. This changes the CTS by providing a cross-reference to the requirements of the various SI Functions in lieu of listing each for the Phase A Containment Isolation Functional Unit.

The purpose of CTS Functional Unit 3.a.2) is to provide proper requirements to ensure the SI signal from ESFAS will actuate the Containment Phase A Isolation. The ITS requirements state to refer to Function 1 for all initiation functions and requirements. Thus, in the ITS, all portions of the SI Input from ESFAS that actuate the Containment Phase A Isolation is governed by the requirements of ITS Table 3.3.2-1 Function 1. This is acceptable, since ITS Table 3.3.2-1 Function 1 provides requirements consistent with the CTS requirements. The CTS requires 2 trains to be OPERABLE. For CTS Functional Unit 3.a.2), this requirement is covered by CTS Functional Unit 1.b (ITS Table 3.3.2-1 Function 1.b), the Automatic Actuation Logic and Actuation Relays Function, since the SI Input from ESFAS for the Containment Phase A Isolation is through the Solid State Protection System logic. The ACTIONS provided for CTS Functional Unit 3.a.2) are the same as the CTS Functional Unit for Safety Injection and any changes to the ACTIONS are discussed and justified in other DOCs. CTS Functional Unit 3.a.2) requires a CHANNEL FUNCTIONAL TEST every 62 days on a STAGGERED TEST BASIS (as shown in Table 4.3-2 and Note 1) and any changes to the Frequencies are discussed and justified in other DOCs. This Surveillance and Frequency are consistent with the Surveillance and Frequency required by CTS Functional Unit 1.b. Therefore, this change is acceptable and designated as an administrative change because it does not result in a technical change to the CTS.

A10 CTS Table 3.3-3 Functional Units 4.a (Steam Line Isolation, Manual), 5.a (Turbine Trip & Feedwater Isolation, Steam Generator Water Level— High-High), 6.c.i.a (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Motor-Driven Pumps, Steam Generator Water Level--Low-Low (Adverse)), 6.c.i.b (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Motor Driven Pumps, Steam Generator Water Level--Low-Low (EAM)), 6.c.ii.a (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Turbine-Driven Pump, Steam Generator Water Level--Low-Low (Adverse)), and 6.c.ii.b (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Turbine Driven Pump, Steam Generator Water Level--Low-Low (EAM)), include the phrase "operating steam line," "in each operating loop," or "in each Operating Stm. Gen." in the "MINIMUM CHANNELS OPERABLE" column. ITS Table 3.3.2-1 Functions 4.a (Steam Line Isolation, Manual Initiation), 5.b (Turbine Trip and Feedwater Isolation, SG Water Level - High High (P-14)), 6.b.(1) (Auxiliary Feedwater, SG Water Level - Low Low, Adverse), or 6.b.(2) (Auxiliary Feedwater, SG Water Level - Low Low, EAM), "Required Channels" column does not contain this information. This changes the CTS by removing the phrases "operating steam line," "in each operating loop," or "in each Operating Stm. Gen."

The purpose of the phrases "in each operating loop," or "in each Operating Stm. Gen." is to allow for unit operation with less than all four steam lines, RCS loops, or steam generators in operation. Although CTS Table 3.3-3 Minimum Channels OPERABLE column includes the information, relating to "operating," the CTS Functional Units associated ACTIONS require action to be taken when the number of OPERABLE channels is one less than the Total Number of Channels, which does not include the phrases relating to "operating." ITS Table 3.3.2-1 "Required Channels" column for these Functions retains the OPERABLE channel requirements contained in CTS Table 3.3-3 "Total No. of Channels" column. This change is acceptable because the OPERABILITY requirements associated with the number of OPERABLE channels is the same in CTS as in ITS. This change is designated as administrative because it does not result in technical changes to the CTS.

A11 CTS Table 3.3-3 Functional Unit 8.c, Table 3.3-4 Functional Unit 8.d, and Table 4.3-2 Functional Unit 8.c provide requirements for the Engineered Safety Feature Actuation System Interlock – Steam Generator Level P-14. CTS Table 3.3-3, requires that Functional Unit 8.c have 3 channels per loop OPERABLE in MODES 1 and 2, CTS Table 3.3-4 requires the nominal trip set point and allowable value to be set in accordance with Functional Unit 5 (Turbine Trip and Feedwater Isolation) for Functional Unit 8.d, and CTS Table 4.3-2 provides Surveillance Requirements for Functional Unit 8.c. With less than 3 channels per loop OPERABLE in MODES 1 and 2, ACTION 22c requires the interlock be declared inoperable and verification that all affected channels for CTS Functional Unit 5.a (Turbine Trip & Feedwater Isolation - Steam Generator Water Level High-High) are OPERABLE or to apply the appropriate ACTION statement(s) for Functional Unit 5.a. ITS Table 3.3.2-1 links P-14 to Function 5.b (SG Water Level - High High (P-14)) requiring 3 channels per steam generator to be OPERABLE in MODES 1, 2, and 3, with MODES 2 and 3 modified by Note (k) stating except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. In addition, CTS Table 4.3-2 requires a CHANNEL CALIBRATION every 18 months for Functional Unit 8.c as is required by ITS SR 3.3.2.8 for Function 5.b. This changes the CTS by linking P-14 directly to the Steam Generator Water level High-High Function (CTS Functional Unit 5.a, ITS Function 5.b) instead of indirectly with a separate interlock Functional Unit.

This change proposes to eliminate CTS Tables 3.3-3 and 4.3-2 Functional Unit 8.c (Table 3.3-4 Functional Unit 8.d) as a separate line item. The SG Water Level - High High interlock Function is adequately addressed in the ESFAS Specification as Function 5.b, SG Water Level High-High. The requirement to address this function separately as an ESFAS Interlock is unnecessary. All necessary requirements (Applicable MODES, Required Channels, Condition, Surveillance Requirements, and setpoints) for the SG Water Level High-High function are adequately addressed by the existing Turbine Trip and Feedwater Isolation Function 5.b on ITS ESFAS Table 3.3.2-1. The Required Action associated with Function 5.b is to place the inoperable channel in trip. The requirement to place the inoperable channel in trip is appropriate and sufficient for the SG Water Level High-High Function as it is for the majority of other trip functions on Table 3.3.2-1. The requirement to verify interlock status does not impose any additional requirements beyond those required for the SG Water Level High-High function. This change is designated as administrative because it does not result in a technical change to the CTS.

A12 CTS Table 3.3-3, Table 3.3-4, and Table 4.3-2, contain requirements for Functional Unit 6.a (Auxiliary Feedwater, Manual) and Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) both of which are the method of manually starting the Auxiliary Feedwater Pumps. In addition, CTS Table 3.3-3 contains ACTION 24 which is only associated with Functional Unit 6.a. ITS Table 3.3.2-1 does not contain a Function similar to CTS Functional Unit 6.a, only Function 6.c (Safety Injection). This changes the CTS by eliminating a duplicate Functional Unit and its associated requirements.

The purpose of CTS Tables 3.3-3, 3.3-4, and 4.3-2 requirements for Functional Unit 6.a is to ensure two channels are OPERABLE to manually start Auxiliary Feedwater. The two channels required associated with Functional Unit 6.a are the two Safety Injection System Actuate hand switches, which are the same channels as Functional Unit 1.a (Safety Injection, Manual). CTS Tables 3.3-3, 3.3-4, and 4.3-2 contain similar requirements for Functional Unit 1.a (Safety Injection, Manual) as Functional Unit 6.a. Because CTS also requires Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) that refers to CTS Functional Unit 1 for its requirements and ITS Table 3.3.2-1 Function 6.c refers to Function 1 (Safety Injection) for its requirements, listing a separate manual Function for Auxiliary Feedwater Pump actuation is unnecessary and is combined with ITS Function 6.c (Auxiliary Feedwater, Safety Injection). In addition, CTS Table 3.3-3 ACTION 24 is only associated with Functional Unit 6.a. Because CTS Functional Unit 6.a is being eliminated, ACTION 24 is no longer necessary and is also being eliminated. This change is designated as administrative because it does not result in a technical change to the CTS.

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

A13 CTS Table 3.3-3 Note #, in part, is associated with Functional Units 1.d (Safety Injection, Pressurizer Pressure-Low) and 1.f (Safety Injection, Steam Line Pressure-Low). CTS Table 3.3-3 Note # modifies the Functional Unit's MODE of Applicability by stating that the trip function may be bypassed in MODE 3 below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint. ITS Table 3.3.2-1 footnote (a) is associated with Functions 1.d (Safety Injection, Pressurizer Pressure-Low), and 1.e (Safety Injection, Steam Line Pressure-Low). ITS Table 3.3.2-1 footnote (a) modifies the Function's Applicability by stating "Above the P-11 (Pressurizer Pressure) interlock." This changes the CTS by replacing the description of how the P-11 interlock operates and when the Functions are allowed to be bypassed, with a statement of when the Functions are required to be OPERABLE.

The purpose of CTS Table 3.3-3 Note # is to modify the Applicability for the associated Functional Units stating when it is permissible for these Functional Units to be bypassed. Note # does this by providing information on the Functional Units interaction with interlock P-11. One purpose of P-11 is to prevent an inadvertent ECCS actuation during plant heatup and cooldown by blocking portions of the safety injection and steam line isolation signal actuation logic. The pressurizer low pressure and steamline low pressure safety injection actuation signals can be manually blocked when RCS pressure is below the P-11 permissive setpoint. CTS Table 3.3-3 Note # states that these Functional Units may be bypassed when below P-11. ITS Table 3.3.2-1 footnote (a) modifies the applicability of the pressurizer low pressure and steamline low pressure safety injection Functions, stating that they are required to be OPERABLE above the P-11 (Pressurizer Pressure) interlock. Thus replacing the statements in CTS for when they may be bypassed with statements in ITS for when these Functions are required to be OPERABLE. Therefore, ITS requires these Functions to provide a signal that will actuate safety injection under the same Conditions as CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A14 CTS Table 3.3-3 Note #, in part, is associated with Functional Unit 4.d (Steam Line Isolation, Steam Line Pressure-Low). CTS Table 3.3-3 Note # modifies the Functional Unit's MODE of Applicability by stating that the trip function may be bypassed in MODE 3 below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint. ITS Table 3.3.2-1 footnote (f) is associated with Function 4.d.(1) (Steam Line Isolation, Steam Line Pressure, Low). ITS Table 3.3.2-1 footnote (f) modifies the Function's applicability by stating when Steam Line Isolation on Steam Line Pressure Negative Rate–High is blocked." This changes the CTS by replacing the description of how the P-11 interlock operates and when the Function is allowed to be bypassed, with a statement of when the Function is required to be OPERABLE.

The purpose of CTS Table 3.3-3 Note # is to modify the Applicability for the associated Functional Units stating when it is permissible for this Functional Unit to be bypassed. Note # does this by providing information on the Functional Units interaction with interlock P-11. One purpose of P-11 is to prevent an inadvertent ECCS actuation during plant heatup and cooldown by blocking portions of the steam line isolation signal actuation logic. The steam line isolation steam pressure low actuation signal can be manually blocked when RCS pressure is below the P-11 permissive setpoint. CTS Table 3.3-3 Note # states that this Functional Unit may be bypassed when below P-11. ITS Table 3.3.2-1 footnote (a) modifies the Applicability of the Steamline Isolation, Steam Line Pressure, Low Function by stating that this Function is required to be OPERABLE when Steam Line Isolation on Steam Line Pressure Negative Rate–High is blocked. Therefore, ITS requires this Function to provide a signal that will actuate steam line isolation under the same Conditions as CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A15 CTS Table 3.3-3 Note ## is associated with Functional Unit 4.e (Steam Line Isolation, Negative Steam Line Pressure Rate-High). CTS Table 3.3-3 Note ## modifies the Functional Unit's MODE of Applicability by stating that that the trip function is automatically blocked above P-11 and that it may be blocked below P11 when Safety Injection on Steam Line Pressure-Low is not blocked. ITS Table 3.3.2-1 footnote (g) is associated with Function 4.d.(2) (Steam Line Isolation, Steam Line Pressure, Negative Rate-High). ITS Table 3.3.2-1 footnote (g) modifies the applicability of the Steam Line Isolation, Steam Line Pressure, Negative Rate-High Function by stating that this Function is required to be OPERABLE when the Steam Line Isolation on Steam Line Pressure–Low Function is blocked." This changes the CTS by replacing the description of how the P-11 interlock operates and when the Function is allowed to be blocked, with a statement of when the Function is required to be OPERABLE.

The purpose of CTS Table 3.3-3 Note ## is to modify the Applicability for the associated Functional Unit stating when it is permissible for this Functional Unit to be blocked. Note ## does this by providing information on the Functional Unit's interaction with interlock P-11. One purpose of P-11 is to prevent an inadvertent ECCS or steam line isolation actuation during plant heatup and cooldown by blocking portions of the safety injection and steam line isolation signal actuation logic. The steam line isolation Negative Steam Line Pressure Rate-High actuation signal is automatically blocked when RCS pressure is above the P-11 permissive setpoint and can be manually enabled below P-11. CTS Table 3.3-3 Note ## states that this Functional Unit's trip function is automatically blocked above P-11 and may be blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked. ITS Table 3.3.2-1 footnote (g) modifies the Applicability of the Steam Line Isolation, Steam Pressure, Negative Rate-High Function by stating that this Function is required to be OPERABLE when Steam Line Isolation on Steam Line Pressure–Low is blocked. Therefore, ITS requires this Function to provide a signal that will actuate steam line isolation under the same Conditions as CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A16 CTS Table 3.3-3 ACTION 20 requires that with the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. CTS Table 3.3-3 ACTION 20 is applicable to CTS Table 3.3-3 Functional Units

1.a (Safety Injection – Manual Initiation), 2.a (Containment Spray – Manual), 3.a.1) (Containment Isolation Phase A – Manual), 3.b.1) (Containment Isolation Phase B – Manual), and 6.f (Auxiliary Feedwater - Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump). CTS Table 3.3-3 Functional Units 1.a, 2.a, 3.a.1, and 3.b.1 MODE of Applicability is MODES 1, 2, 3, and 4 while Functional Unit 6.f MODE of Applicability is MODES 1 and 2 when one or more Main Feedwater Pump(s) are supplying feedwater to steam generators. ITS LCO 3.3.2 ACTION N is applicable to ITS Table 3.3.2-1 Function 6.e (Trip of all Main Feedwater Pumps) and requires restoring the channel to OPERABLE status in 48 hours or be in MODE 3 in 54 hours. This changes the CTS by explicitly stating that for an inoperable Main Feedwater Pumps trip channel the unit is only required to be shut down to MODE 3 within 54 hours if the channel is not returned to OPERABLE status.

The purpose of CTS Table 3.3-3 ACTION 20 is to provide remedial actions 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. As in ACTION 20, these remedial ACTIONS can be used to place the unit in a MODE or other specified condition in which the LCO is not applicable. For CTS Table 3.3-3 Functional Unit 6.f the MODE of Applicability is MODES 1 and 2 when one or more Main Feedwater Pump(s) are supplying feedwater to steam generators. CTS Table 3.3-3 ACTION 20 requires that with the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. For CTS Table 3.3-3 Functional Unit 6.f with one channel inoperable ACTION 20 would require a unit shut down after 48 hours being in HOT STANDBY within the next 6 hours (54 hours total). Once in HOT STANDBY the unit has exited the MODE of Applicability for this Functional Unit and no further ACTION is required. In ITS, LCO 3.3.2 ACTION N requires either the inoperable channel be returned to an OPERABLE status in 48 hours or the unit placed in MODE 3 in 54 hours. This change is acceptable because the specified ACTIONS in ITS are the same as those in CTS for an inoperable Auxiliary Feedwater - Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump channel. This change is designated as administrative because it does not result in technical changes to the CTS.

A17 CTS Table 3.3-3 ACTION 22 applies to Functional Units 8.a (Engineered Safety Feature Actuation System Interlocks, Pressurizer Pressure- P-11/Not P-11) and 8.c (Engineered Safety Feature Actuation System Interlock, Steam Generator Level P-14) requiring that with less than the Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE "or apply the appropriate ACTION statement(s) for those functions." CTS Table 3.3-3 Functional Unit 8.c is being combined with CTS Table 3.3-3 Functional Unit 5.a (Turbine Trip & Feedwater Isolation, Steam Generator Water Level – High-High) and is discussed in DOC A11. ITS LCO 3.3.2 ACTION Q is associated with Functions 8.b(1) (ESFAS Interlocks, Pressurizer Pressure P-11, Unblock (Auto Reset of SI Block)) and 8.b(2) (ESFAS Interlocks, Pressurizer Pressure P-11, Enable Manual Block of SI), providing the Required Actions for an inoperable interlock that verifies the interlock is in the required state for existing unit condition within one hour "or to be in MODE 3, for Required Action Q.2.1, within 7 hours from discovery and to be in MODE 4, for Required Action Q.2.2, within 13 hours from discovery." This changes the CTS by providing specific ACTIONS when the associated interlock cannot be verified in the correct position for unit conditions.

The purpose of the CTS ACTION 22 is to ensure proper compensatory measures are taken in the event of an inoperable ESFAS interlock. Similarly, the purpose of ITS 3.3.2 ACTION Q is to ensure proper compensatory measures are taken in the event of an inoperable ESFAS interlock. In CTS, if the number of OPERABLE Pressurizer Pressure P-11 Interlock channels is less than that required by the Minimum Channels OPERABLE column, the interlock is declared inoperable and all affected channels of the Functions listed are verified OPERABLE or the appropriate ACTIONS for the affected channels are applied. Because the interlock is used to enable or block its associated Functions, if the interlock is in the wrong position for plant conditions the associated Function is inoperable (all channels) and CTS LCO 3.0.3 would be followed. CTS LCO 3.0.3 requires initiation of action in one hour to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in: 1) at least HOT STANDBY within the next 6 hours; 2) at least HOT SHUTDOWN within the following 6 hours; and 3) at least COLD SHUTDOWN within the subsequent 24 hours. For the Functional Units associated with P-11 the MODE of Applicability is MODES 1, 2, and 3. Therefore in CTS once a P-11 channel is discovered inoperable the affected channels associated Functional Units would be verified OPERABLE and if not action would be initiated within one hour to place the unit in HOT STANDBY within 6 hours and HOT SHUTDOWN within the following 6 hours, a total of 13 hours. ITS LCO 3.3.2 ACTION Q requires verifying the interlock is in the required state within one hour and if not be in MODE 3 within 7 hours and MODE 4 within 13 hours. 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 are the same in CTS as in ITS. This change is designated as administrative because it does not result in technical changes to the CTS.

A18 CTS Table 4.3-2 requires CHANNEL FUNCTIONAL TEST for Functional Units 1.a (Safety Injection and Feedwater Isolation, Manual Initiation), 2.a (Containment Spray, Manual Initiation), 3.a.1 (Containment Isolation, Phase "A" Isolation, Manual), 3.b.1 (Containment Isolation, Phase "B" Isolation, Manual), 4.a (Steam Line Isolation, Manual), 6.e.1 (Auxiliary Feedwater, Loss of Power Start, Voltage Sensors), 6.f (Auxiliary Feedwater, Trip of Main Feedwater Pumps), and Table 4.3-1 Functional Unit 22.g (Reactor Trip P-4). ITS Table 3.3.2-1 requires similar tests, ITS SR 3.3.2.6 (TADOT), to be performed for Function 6.d.1 (Auxiliary Feedwater, Loss of Power Start, Voltage Sensors); ITS SR 3.3.2.7 (TADOT) to be performed for Functions 1.a (Safety Injection, Manual Initiation), 2.a (Containment Spray, Manual Initiation), 3.a.(1) (Containment Isolation, Phase "A" Isolation, Manual), 3.b.(1) (Containment Isolation, Phase "B" Isolation, Manual), 4.a (Steam Line Isolation, Manual Initiation), 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps); and ITS SR 3.3.2.10 (TADOT) to be performed for Function 8.a (Reactor Trip, P-4) with the addition of a Note that states, "Verification of setpoint is not required," or "Verification of setpoint not required for manual initiation functions." This changes the CTS by requiring a TADOT without setpoint verification instead of a CHANNEL FUNCTIONAL TEST.

CTS 1.6 states that for an analog channel a CHANNEL FUNCTIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions. ITS 1.1 defines a TADOT as consisting of operating the trip actuating device and verifying the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. ITS further states that the TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. Because the TADOT includes adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy, which is not included in the CTS CHANNEL FUNCTIONAL TEST, ITS SR 3.3.2.6, SR 3.3.2.7, and SR 3.3.2.10 includes the Note, "Verification of setpoint is not required," or "Verification of setpoint not required for manual initiation functions." A TADOT without setpoint verification provides a similar test for these channels as the CTS CHANNEL FUNCTIONAL TEST. This change is designated as administrative because it does not result in technical changes to the CTS.

A19 CTS Table 4.3-2 requires CHANNEL CALIBRATION for Functional Units as designated. ITS SR 3.3.2.8 requires similar calibration for these Functional Units. For those Functional Units associated with ITS SR 3.3.2.8, a Note is added to SR 3.3.2.8 stating, "This Surveillance shall include verification that the time constants are adjusted to the prescribed values." This changes the CTS by adding specific guidance that the time constant adjustment, as applicable, is part of the calibration for these Functional Units.

CTS 1.19, OPERABLE-OPERABILITY definition, in part states, "A system, subsystem, train, or component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation . . . . to perform its function(s) are also capable of performing their related support function(s)." ITS OPERABLE-OPERABILITY definition, in part states, "A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation . . . to perform its specified safety function(s) are also capable of performing their related support function(s). For CTS, as in ITS, the related time constants of an instrument channel are required to be set properly. To ensure they are set properly verification is required. By stating in the surveillance requirement that the CHANNEL CALIBRATION requires verification of the time constants restates what OPERABILITY requires. This change is designated as administrative because it does not result in technical changes to the CTS.

A20 CTS 4.3.2.1.3 states in part that the ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit. CTS 4.7.1.2.2 and CTS 4.7.1.2.4 are each modified by a Note that states, "Not required to be completed for the turbine driven Auxiliary Feedwater (AFW) pump until 24 hours after steam supply pressure is greater than or equal to 842 psig."

ITS SR 3.3.2.9 requires verification that ESFAS RESPONSE TIMES are within limit. ITS 3.3.2.9 is modified by a Note that states, "Not required to be performed for the turbine driven AFW pump until 24 hours after SG pressure is greater than or equal to 842 psig." This changes the CTS by explicitly stating and duplicating the allowance found in CTS 3.7.1.2 for the TD AFW pump to delay performance of surveillances until adequate steam pressure is available.

The purpose of CTS 4.3.2.1.3 is to verify that the response time assumptions from the accident analysis are within limits. ITS defines ESF RESPONSE TIME as the time interval from when the monitored parameter exceeds its actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). CTS 4.7.1.2.2 requires verification that the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head. CTS 4.7.1.2.2 is modified by a Note for the TD AFW pump that states, "Not required to be completed for the turbine driven AFW pump until 24 hours after steam supply pressure is greater than or equal to 842 psig." Because the ESF RESPONSE TIME test end time is when the TD AFW pump reaches its required developed head a valid test cannot be performed until adequate steam generator pressure is reached. This relationship is implicit in CTS where in ITS the addition of the Note to ITS SR 3.3.2.9 makes this relationship explicit. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip System Interlocks – Reactor Trip (P-4)) Applicable MODES are 1, 2, and * where Note * states with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel. CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip System Interlocks – Reactor Trip P-4) associated ACTION 14 requires that with the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE the plant be in at least HOT STANDBY within 6 hours. ITS Table 3.3.2-1 Function 8.a (ESFAS Interlocks - Reactor Trip, P-4) Applicable MODES or other Specified Conditions lists MODES 1, 2, 3 as the Applicable MODES. ITS Table 3.3.2-1 Function 8.a (ESFAS Interlocks - Reactor Trip, P-4) associated ACTION G allows 48 hours to restore the channel or train to OPERABLE status or be in MODE 3 (CTS HOT STANDBY) in 54 hours and MODE 4 (CTS HOT SHUTDOWN) in 60 hours. This changes the CTS by increasing the MODES the Reactor Trip (P-4) interlock must be OPERABLE and requiring the unit to be shutdown to MODE 4 instead of only MODE 3.

The purpose of CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip System Interlocks – Reactor Trip P-4) Applicable MODES and associated ACTION 14 is to state the combination of conditions the specified Functional Unit is required to be capable of performing its specified function(s) and provide 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 acceptable because the MODES in which the P-4 interlock is required to be OPERABLE have been increased and the allowed Completion Times for plant shutdown are reasonable to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. This change is designated as more restrictive because additional MODES of Applicability are applied and additional Required Actions have been imposed when a P-4 channel is inoperable.

M02 CTS 4.3.1.1.1 and CTS 4.3.2.1.1 require that each reactor trip system and ESFAS instrumentation channel and interlock be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST for the MODES and at the Frequencies shown in Table 4.3-1 and Table 4.3-2. Specifically, CTS Table 4.3-1 and 4.3-2 require performance of a CHANNEL FUNCTIONAL TEST at the Frequencies shown on the Tables. ITS 3.3.2 requires the performance of a CHANNEL OPERATIONAL TEST (COT), a TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT), or an ACTUATION LOGIC TEST. This changes the CTS by replacing the CHANNEL FUNCTIONAL TEST requirements with a COT, a TADOT, or an ACTUATION LOGIC TEST.

This change is acceptable because a COT, a TADOT, or an ACTUATION LOGIC TEST continues to perform a test similar to the current CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The ITS ACTUATION LOGIC TEST, CHANNEL OPERATIONAL TEST (COT), and TRIP ACTUATING DEVICE OPERATION TEST (TADOT) provide similar tests with the addition that the COT and TADOT include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires an additional acceptance criteria that is not currently required in the CTS.

M03 CTS Table 4.3-1 Functional Unit 22.G (Reactor Trip System Interlocks – Reactor Trip, P-4) requires a CHANNEL FUNCTIONAL TEST be performed at least once per 18 months (R). ITS Table 3.3.2-1 Function 8.a (ESFAS Interlocks – Reactor Trip, P-4) requires a TADOT be performed "Once per reactor trip breaker cycle" (SR 3.3.2.10). This changes the CTS by increasing the Frequency at which testing of the P-4 interlock is performed.

The purpose of the P-4 interlock is to provide the appropriate interlock when the reactor trip breaker and its corresponding bypass breaker are open. The purpose of the CTS CHANNEL FUNCTIONAL TEST and the ITS TADOT (SR 3.3.2.10) is to verify proper operation of the P-4 interlock. Normal plant operation is to produce power for 18 months then to refuel the reactor and perform maintenance. When the power operation period is over the plant is shut down and the reactor trip breakers and reactor trip bypass breakers are opened. In ITS the Frequency for the performance of the TADOT is once per reactor trip breaker cycle. Thus if a reactor trip breaker is cycled between normal refueling shutdowns, the P-4 circuit would be tested by performance of a TADOT. This results in a potential to perform SR 3.3.2.10 more frequently than once per 18 months. This change is acceptable because it will provide additional assurance that the P-4 interlock is capable of performing its function each time a reactor trip breaker is cycled. This change is designated as more restrictive because the testing Frequency has been increased from the CTS requirements.

M04 CTS Table 3.3-3, "Engineered Safety Feature Actuation System Instrumentation"; Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Setpoints"; and Table 4.3-2, "Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements"; include Functional Unit requirements for Automatic Actuation Logics but do not contain requirements for Actuation Relays (i.e., Master Relays or Slave Relays). CTS requirements for Automatic Actuation Logic are included in CTS Tables 3.3-3, 3.3-4, and 4.3-2 for Functional Units 1.b (Safety Injection and Feedwater Isolation, Automatic Actuation Logic), 2.b (Containment Spray, Automatic Actuation Logic), 3.b.2) (Containment Isolation, Automatic Actuation Logic), 4.b (Steam Line Isolation, Automatic Actuation Logic), 5.b (Turbine Trip & Feedwater Isolation, Automatic Actuation Logic), 6.b (Auxiliary Feedwater, Automatic Actuation Logic), and 9.b (Automatic Switchover to Containment Sump, Automatic Actuation Logic). ITS contains requirements for Automatic Actuation Logics and adds OPERABILITY requirements for Actuation Relays and Surveillance Requirements for Master Relays and Slave Relays in ITS Table 3.3.2-1 to Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), 3.a(2) (Containment Isolation, Phase "A" Isolation, Automatic Actuation Logic and Actuation Relays), 3.b(2) (Containment Isolation, Phase "B" Isolation, Automatic Actuation Logic and Actuation Relays), 4.b (Steam Line Isolation, Automatic Actuation Logic and Actuation Relays), 5.a (Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays), 6.a (Auxiliary Feedwater, Automatic Actuation Logic and Actuation Relays), and 7.a (Automatic Switchover to Containment Sump, Automatic Actuation Logic and Actuation Relays). In ITS the Surveillance Frequency for the MASTER RELAY TEST is 92 days on a STAGGERED TEST BASIS (SR 3.3.2.3) while the SLAVE RELAY TEST Surveillance Frequency is every 18 months (SR 3.3.2.5). The addition of the Automatic Actuation Logic and Actuation Relay Function added to CTS Functional Unit 3 (Containment Isolation) is discussed under DOC M05. This changes the CTS by adding requirements for Actuation Relays to the appropriate ITS Functions including LCO, required number of channels, ACTIONS, and Surveillance Requirements for Master and Slave Relays.

This change is acceptable because the Automatic Actuation Logic and Actuation Relays Function are required to support the OPERABILITY of the associated Functions. As such, explicitly including requirements for the Actuation Relays in the ITS provides additional assurance that the OPERABILITY of the associated Functions will be maintained. The change provides explicit requirements for testing the Actuation Relay Function. The addition of SR 3.3.2.3 (a MASTER RELAY TEST), and SR 3.3.2.5 (a SLAVE RELAY TEST) is acceptable because these tests provide additional assurance the Actuation Relays are capable of performing their required function. The proposed Frequency for testing of the master relays is consistent with the Frequency for testing of the Automatic Actuation Logic for these associated Functions. The Frequency proposed for testing of the slave relays is consistent with the current Frequency for testing of the slave relays. This change is designated as more restrictive because it adds new requirements for ESFAS Actuation Relays to the CTS.

M05 CTS Table 3.3-3, Table 3.3-4, and Table 4.3-2, Functional Unit 3.a (Containment Isolation Phase "A" Isolation) does not specifically include the Automatic Actuation Logic and Actuation Relays Function. ITS Table 3.3.2-1 Function 3.a.(2) requires two Automatic Actuation Logic and Actuation Relay trains to be OPERABLE in MODES 1, 2, 3, and 4, provides Conditions to enter with less than the required channels OPERABLE, and Surveillance Requirements. ITS 3.3.2 ACTION C has been included for this Function, providing 24 hours to restore an inoperable train if one train is inoperable, and if not restored, provides a shutdown requirement. A Note that allows one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE, modifies the Required Actions associated with ACTION C. Additionally, ITS Table 3.3.2-1 Function 3.a.(2) requires the performance of SR 3.3.2.2, an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS; SR 3.3.2.3, a MASTER RELAY TEST, every 92 days on a STAGGERED TEST BASIS; and SR 3.3.2.5, a SLAVE RELAY TEST, every 18 months. This changes the CTS by adding Function 3.a.(2) (Containment Isolation Phase A Isolation Automatic Actuation Logic and Actuation Relays) to the Technical Specifications including the LCO, number of channels (2 trains), and 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 Isolation Phase "A" Isolation Function. As such, explicitly including requirements for the Automatic Actuation Logic and Actuation Relays Function in the Technical Specifications provides additional assurance that the OPERABILITY of the Containment Isolation Phase "A" Isolation Function will be maintained. The proposed ACTION for ITS Table 3.3.2-1 Function 3.a.(2) is ACTION C. ACTION C is consistent with the ACTIONS associated with an inoperable train of automatic actuation logic for other ESFAS functions. The change also provides explicit requirements for testing the Automatic Actuation Logic and Actuation Relays Function (ITS Table 3.3.2-1 Function 3.a.(2)). The addition of SR 3.3.2.2 (an ACTUATION LOGIC TEST), SR 3.3.2.3 (a MASTER RELAY TEST), and SR 3.3.2.5 (a SLAVE RELAY TEST) is acceptable because currently the requirements of SR 3.3.2.2 and SR 3.3.2.3 are satisfied during the performance of the CHANNEL FUNCTIONAL TEST for CTS Table 4.3-2 Functional Unit 3.a.2)

(From Safety Injection Automatic Actuation Logic) channels, and the requirements of SR 3.3.2.5 are satisfied during the performance of the TADOT associated with the Manual Initiation Function. This change is designated as more restrictive because it adds an LCO, ACTIONS, and SRs for the Containment Isolation Phase A Isolation Automatic Actuation Logic and Actuation Relays Function to the CTS.

M06 For CTS Table 3.3-3 Functional Unit 8.a, the number of channels listed in the "TOTAL NO. OF CHANNELS" column is greater than that listed in the "MINIMUM OPERABLE CHANNELS" column. CTS Table 3.3-3 ACTION 22 specifies the actions to take with less channels OPERABLE than specified in the "Minimum Channels OPERABLE" column. ITS LCO 3.3.2 requires the ESFAS instrumentation for each Function in ITS Table 3.3.2-1 to be OPERABLE, including only one column titled "REQUIRED CHANNELS," where for this Function the number of ITS "Required Channels" equals the CTS "TOTAL Number of Channels," and ITS 3.3.2 ACTION A specifies the action to take under the Condition where one or more Functions have one or more "Required Channels" or trains inoperable. This changes the CTS by matching the number of channels listed in the "REQUIRED CHANNELS" column to the number listed in the "TOTAL NO. OF CHANNELS" column, where action is required if the number of OPERABLE channels is not met.

This change is acceptable because the requirements for when actions must be taken are increased. The "REQUIRED CHANNELS" column reflects the CTS "Total NO. OF CHANNELS" column which is greater than the CTS MINIMUM CHANNELS OPERABLE" column, the current requirement for when actions are required to be taken. This change is designated as more restrictive because actions are required to be taken with fewer channels inoperable.

M07 CTS Table 3.3-3 ACTION 17 provides the actions to be taken when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that STARTUP (similar to ITS MODE 2) and/or POWER OPERATION (similar to ITS MODE 1) may proceed, provided the listed conditions are satisfied. However, no action is specified if the listed conditions are not satisfied. ITS 3.3.2 Required Actions D.2.1 and D.2.2 require the unit to be in MODE 3 within 6 hours and MODE 4 within an additional 6 hours if conditions similar to those in CTS Table 3.3-3 ACTION 17 are not satisfied. This changes the CTS by providing a specific action for completion within a prescribed period when stipulated conditions are not met.

The purpose of CTS Table 3.3-3 ACTION 17 is to provide the actions when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. CTS 3.0.3 provides actions when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements. Because CTS Table 3.3-3 ACTION 17 does not provide any further actions if those listed are not satisfied CTS 3.0.3 would be entered. CTS 3.0.3 states that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply. CTS Table 3.3-3 ACTION 17 states that Startup and/or POWER OPERATION

(MODES 2 and 1 respectively) may proceed if the listed conditions are satisfied. Therefore, in accordance with CTS 3.0.3, the MODE reached first that the Specification does not apply would be MODE 3. CTS 3.0.3 states, in part, 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 (MODE 3) within the next 6 hours (a total of 7 hours to reach MODE 3) and at least HOT SHUTDOWN (MODE 4) within the following 6 hours. ITS LCO 3.3.2 Required Action D.2.1 only allows 6 hours to reach MODE 3, while D.2.2 allows an additional 6 hours to reach MODE 4. This change is acceptable because less time is allowed to reach MODE 3 and MODE 4 while allowing adequate time to reach the required plant condition from full power conditions in an orderly manner and without challenging plant systems. This change is designated as more restrictive because ITS will allow less time to reach MODE 3 and MODE 4 than is allowed in the CTS.

M08 CTS Table 3.3-3 ACTION 18 provides the actions to be taken when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that operation may proceed, provided the listed conditions are satisfied. However, no actions are specified if the listed conditions are not satisfied. Under similar conditions, ITS 3.3.2 Required Actions E.2.1 and E.2.2 require the unit to be in MODE 3 within 6 hours and MODE 4 within an additional 6 hours. This changes the CTS by providing a specific action for completion within a prescribed period when stipulated conditions are not met.

The purpose of CTS Table 3.3-3 ACTION 18 is to provide the actions when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. CTS 3.0.3 provides actions when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements. Because CTS Table 3.3-3 ACTION 18 does not provide further actions if those listed are not satisfied, CTS 3.0.3 would be entered. CTS 3.0.3 states, in part, 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 (MODE 3) within the next 6 hours (a total of 7 hours to reach MODE 3) and at least HOT SHUTDOWN (MODE 4) within the following 6 hours. ITS LCO 3.3.2 Required Action E.2.1 allows 6 hours to reach MODE 3, while E.2.2 allows an additional 6 hours to reach MODE 4. This change is acceptable because adequate time is allowed to reach the required plant condition from full power conditions in an orderly manner and without challenging plant systems. This change is designated as more restrictive because ITS will allow less time to reach MODE 3 and MODE 4 than is allowed in the CTS.

M09 CTS Table 3.3-3 ACTION 18 provides the actions to be taken when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that operation may proceed, provided the listed conditions are satisfied. However, no actions are specified if the listed conditions are not satisfied. Under similar conditions, ITS 3.3.2 Required Actions P.2.1 and P.2.2 require the unit to be in MODE 3 within 6 hours and MODE 5 within an additional 30 hours. This

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changes the CTS by providing a specific action for completion within a prescribed period when stipulated conditions are not met.

The purpose of CTS Table 3.3-3 ACTION 18 is to provide the actions when the associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. CTS 3.0.3 provides actions when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements. Because CTS Table 3.3-3 ACTION 18 does not provide further actions if those listed are not satisfied, CTS 3.0.3 would be entered. CTS 3.0.3 states, in part, 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 (MODE 3) within the next 6 hours (a total of 7 hours to reach MODE 3), at least HOT SHUTDOWN (MODE 4) within the following 6 hours, and at least COLD SHUTDOWN (MODE 5) within the subsequent 24 hours. ITS LCO 3.3.2 Required Action P.2.1 allows 6 hours to reach MODE 3, while P.2.2 allows an additional 30 hours to reach MODE 5. This change is acceptable because adequate time is allowed to reach the required plant condition from full power conditions in an orderly manner and without challenging plant systems. This change is designated as more restrictive because ITS will allow less time to reach MODE 3 and MODE 4 than is allowed in the CTS.

M10 CTS Table 3.3-3 Functional Unit 8.a (Engineered Safety Feature Actuation System Interlocks, Pressurizer Pressure-P-11/Not P-11) associated ACTION 22 requires, in part, that with less than the Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed are OPERABLE. ITS Table 3.3.2-1 Function 8.b.(1) (ESFAS Interlocks, Pressurizer Pressure, P-11, Unblock (Auto Reset of SI Block)) and Function 8.b.(2) (ESFAS Interlocks, Pressurizer Pressure, P-11, Enable Manual Block of SI) associated Condition Q Required Action Q.1 requires verifying the interlock is in the required state for existing unit conditions within one hour. This changes the CTS by providing an explicit Completion Time for verification of an inoperable interlock's state.

The purpose of CTS Table 3.3-3 ACTION 22 is to provide remedial ACTIONS that must be taken in response to a degraded ESFAS interlock condition in order to minimize risk associated with continued operation while providing time to repair the inoperable interlock. CTS and ITS provide similar Required Actions to verify that the failed interlock will not prevent the associated Functional Units from performing their required function. CTS does not provide a Completion Time for verification on the inoperable interlock's state whereas ITS provides a Completion Time of one hour. This change is designated as more restrictive because an explicit Completion Time is added to verify an inoperable ESFAS interlock is in its required state for unit conditions.

M11 CTS Table 3.3-3 Functional Units 6.c.i.a, Steam Generator Water Level--Low-Low (Adverse), 6.c.i.b, Steam Generator Water Level—Low-Low (EAM); 6.c.ii.a, Steam Generator Water Level--Low-Low (Adverse); and 6.c.ii.b, Steam Generator Water Level—Low-Low (EAM) require entry into ACTION 36 if one channel is inoperable. If the requirements of ACTION 36 are not met, entry into

CTS 3.0.3 will be required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY (ITS MODE 3) within the next 6 hours, and at least HOT SHUTDOWN (ITS MODE 4) within the following 6 hours. ITS 3.3.2 Required ACTION R.1 and R.2 are applicable if ITS 3.3.2 Required ACTIONS I.1, I.2 and associated Completion Times are not met and require the unit to be in MODE 3 within 6 hours and MODE 4 within 12 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 after the Required Actions and associated Completion Times are not met from 7 hours in the CTS to 6 hours in the ITS while the time to be in MODE 4 from MODE 3 remains 6 hours.

The purpose of the CTS ACTIONS is to ensure proper compensatory measures are taken in the event of an inoperable feature and to place the unit in a safe condition. This change is acceptable because the CTS requirements are modified to provide the necessary Required Actions and appropriate Completion Times. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with other CTS and ITS requirements. This change is designated as more restrictive because the Completion Time for the unit to be placed in MODE 3 has been decreased by 1 hour.

M12 CTS Table 3.3-3 Functional Units 6.c.i.c, Steam Generator Water Level--Low-Low, RCS Loop ΔT; and 6.c.ii.c, Steam Generator Water Level--Low-Low RCS Loop ΔT require entry into ACTION 37 if one channel is inoperable. If the requirements of ACTION 37 are not met, entry into CTS 3.0.3 will be required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY (ITS MODE 3) within the next 6 hours, and at least HOT SHUTDOWN (ITS MODE 4) within the following 6 hours. ITS 3.3.2 Required Actions K.3.1 and K.3.2, which are applicable if ITS 3.3.2 Required Action K.1 or K.2 and the associated Completion Time are not met, require the unit to be in MODE 3 within 12 hours and MODE 4 within 18 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 after the Required Actions and associated Completion Times are not met from 7 hours in the CTS to 6 hours in the ITS while the time to be in MODE 4 from MODE 3 remains 6 hours.

The purpose of the CTS ACTIONS is to ensure proper compensatory measures are taken in the event of an inoperable feature and to place the unit in a safe condition. This change is acceptable because the CTS requirements are modified to provide the necessary Required Actions and appropriate Completion Times. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with other CTS and ITS requirements. This change is designated as more restrictive because the Completion Time for the unit to be placed in MODE 3 has been decreased by 1 hour.

M13 CTS Table 3.3-3 Functional Units 6.c.i.d, Steam Generator Water Level--Low-Low, Containment Pressure (EAM); and 6.c.ii.d, Steam Generator Water Level--

Low-Low Containment Pressure (EAM) require entry into ACTION 38 if one channel is inoperable. If the requirements of ACTION 38 are not met, entry into CTS 3.0.3 will be required because no further actions are specified. CTS 3.0.3 allows 1 hour to initiate action to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY (ITS MODE 3) within the next 6 hours, and at least HOT SHUTDOWN (ITS MODE 4) within the following 6 hours. ITS 3.3.2 Required Action J.3.1 and J.3.2, which are applicable if ITS 3.3.2 Required Action J.1 or J.2 and associated Completion Time are not met, require the unit to be in MODE 3 within 12 hours and MODE 4 within 18 hours. This changes the CTS requirements by decreasing the time allowed to be in MODE 3 after the Required Actions and associated Completion Times are not met from 7 hours in the CTS to 6 hours in the ITS while the time to be in MODE 4 from MODE 3 remains 6 hours.

The purpose of the CTS ACTIONS is to ensure proper compensatory measures are taken in the event of an inoperable feature and to place the unit in a safe condition. This change is acceptable because the CTS requirements are modified to provide the necessary Required Actions and appropriate Completion Times. The Completion Time of 6 hours to reach MODE 3 from 100% RTP, in a safe manner without challenging unit systems, is consistent with other CTS and ITS requirements. This change is designated as more restrictive because the Completion Time for the unit to be placed in MODE 3 has been decreased by 1 hour.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-1 for Reactor Trip System instrumentation, specifically Reactor Trip System Interlock P-4, and CTS Table 3.3-3 for ESFAS instrumentation has three columns stating various requirements for each function. These columns are labeled, "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS Table 3.3.2-1 does not retain the "TOTAL NO. OF CHANNELS" or "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases

Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.3.2.1.1 requires that each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2. CTS 4.3.2.1.3 requires that the ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months where each verification includes at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3, 18 months on a STAGGERED TEST BASIS in ITS. The proposed change relocates all periodic Surveillance Frequencies from the CTS Section 3/4.3.2, Engineered Safety Features Actuation System Instrumentation, and places the Frequencies under licensee control in accordance with a new program, the Surveillance Frequency Control Program. The only surveillance not being relocated is the Functional Test for CTS Table 4.3-1 Functional Unit 22.G (Reactor Trip System Interlocks, Reactor Trip P-4) which is retained in ITS SR 3.3.2.10. ITS LCO 3.3.2 Surveillance Requirements require similar Surveillances and, except for special or conditional Frequencies stated in the individual surveillance, specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving designated specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-3 Functional Unit 2.a, (Containment Spray – Manual), and Functional Unit 3.b.1) (Containment Isolation – Phase "B" Isolation

– Manual) "Channels to Trip" column contains a footnote (**) that states, "Two switches must be operated simultaneously for actuation." ITS Table 3.3.2-1 Function 2.a (Containment Spray – Manual) and Function 3.b.1) (Containment Isolation – Phase "B" Isolation – Manual) do not provide this information. This changes the CTS by moving the details of required switch operation for actuation to the ITS Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. 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)* CTS Table 3.3-3 Functional Unit 6.c provides separate Functional Units concerning motor driven and turbine driven AFW pumps. ITS Table 3.3.2-1 does not retain separate Functions for the motor driven AFW pumps and turbine driven AFW pump. This changes the CTS by moving the information of the Functional differences for the motor driven AFW pumps and turbine driven AFW pump 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 difference between the information listed for the motor driven AFW pumps and the turbine drive AFW pumps is associated with the "Number of Channels to Trip" column which is being removed making separate Functions unnecessary. The ITS still retains the requirement for the number of required channels and the appropriate Condition to enter if a required channel becomes inoperable. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-4 Functional Unit 5.a (Turbine Trip and Feedwater Isolation - Steam Generator Water level--High-High) Nominal Trip Setpoint and Allowable Value contains a description specifying the steam generator water level instrument range the limit is associated with. ITS Table 3.3.2-1 Function 5.b (Turbine Trip and Feedwater Isolation - SG Water Level High High (P-14)) does not contain this information. This changes the CTS by moving the details of which steam generator water level instrument range the limit is associated with to the TS 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 Nominal Trip Setpoint and Allowable Value for the Steam Generator Water Level—High-High Functional Unit. 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.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time*) CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip Interlock, Reactor Trip P-4) and associated ACTION 14 requires the plant to be placed in at least HOT STANDBY within 6 hours when the number of P-4 channels OPERABLE is one less than required by the Minimum Channels OPERABLE column (one of two channels inoperable). ITS Table 3.3.2-1 Function 8.a (ESFAS Interlock Reactor Trip P-4) and associated ACTION G allow 48 hours to restore the inoperable channel or train to OPERABLE status before requiring the plant be in MODE 3 (Similar conditions to CTS HOT STANDBY) within 6 hours (54 hour Completion Time). This changes the CTS by increasing the Completion Time for placing the plant in MODE 3 from 6 hours to 54 hours when one channel of P-4 is inoperable.

The purpose of the P-4 interlock is to provide the appropriate interlock when the Reactor Trip Breaker and its corresponding bypass breaker are open. The function actuates turbine trip, provides Feedwater Isolation Signal on Tavg below setpoint, prevents opening of main feedwater valves which were closed by safety injection or high steam generator water level, and allows manual block of the automatic re-actuation of safety injection. 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. This change is designated as less restrictive because additional time is allowed to restore instrument channels to OPERABLE status before placing the plant in MODE 3 than was allowed in the CTS.

L02 *(Category 5 - Deletion of Surveillance Requirement)* CTS Surveillance 4.3.2.1.2 specifies, in part, and CTS Table 4.3-2 Note (2) specifies that the total interlock function shall be demonstrated OPERABLE at least once per 18 months during

CHANNEL CALIBRATION testing of each channel affected by interlock operation. The corresponding ITS Surveillances require an Actuation Logic Test (SR 3.3.2.2) of each Function in Table 3.3.2-1. The ACTUATION LOGIC TEST includes verification that the interlocks do not prevent the Functions from operating properly as required. This changes the CTS by eliminating the Surveillance Requirement to verify the total interlock function during the CHANNEL CALIBRATION.

The interlock functions are part of the solid state protection system (SSPS) logic circuits. Unlike the affected CTS Surveillance, the ITS addresses the testing of logic circuits separately from the CHANNEL CALIBRATION requirements. The ITS CHANNEL CALIBRATION verifies the performance of each channel up to the logic circuits (where channels are combined and lose separate identities). The testing of each channel is governed by the CHANNEL CALIBRATION test definition that ensures the complete channel is verified. The ITS ACTUATION LOGIC TEST verifies all combinations of logic inputs (channels) required for logic circuit OPERABILITY including all required interlocks. As the interlock functions are combinations of channel inputs (e.g., 2/3, 2/4 etc.) in the logic circuitry, the interlock operation is verified during the ACTUATION LOGIC TEST. The interlock logic testing is governed by the ITS ACTUATION LOGIC TEST definition that assures the "input combinations in conjunction with each possible interlock logic state required for OPERABILITY of a logic circuit" are tested. The logic and interlock testing is accomplished by the built in solid state protection system logic tester which also assures all required input combinations and interlocks are fully tested. The proposed change is acceptable because, the required ITS CHANNEL CALIBRATION and more frequent ACTUATION LOGIC TEST (every 92 days on a STAGGERED TEST BASIS) ensure the total interlock function continues to be verified at least once per 18 months (i.e., the same as the CTS surveillance requirement). The ITS defined test terms provide additional assurance that individual channels and all required interlock functions are fully tested. In addition, by separating the logic testing from the CHANNEL CALIBRATION requirements, the ITS presentation of the Surveillance Requirements associated with this instrumentation improve clarity and provide more technically accurate test requirements consistent with industry standards, and the SSPS design including the built in logic test capability. Therefore, the proposed change continues to provide adequate assurance of interlock channel and logic OPERABILITY and does not adversely affect the safe operation of the plant. The proposed change is designated as less restrictive because less stringent requirements will be applied 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 Table 3.3-3, ACTION 15 for Functional Units 1.b (Safety Injection, Automatic Actuation Logic), 2.b (Containment Spray, Automatic Actuation Logic), 3.b.2) (Containment Isolation Phase B, Automatic Actuation Logic), and 9.b (Automatic Switchover to Containment Sump, Automatic Actuation Logic) states, "With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is

OPERABLE." ITS Table 3.3.2-1 designates Condition C as the referenced Condition for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays while designating Condition S as the referenced Condition for Function 7.a (Automatic Switchover to Containment Sump, Automatic Actuation Logic and Actuation Relays). ITS LCO 3.3.1, ACTION C for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and MODE 5 within 60 hours, and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." ITS 3.3.2 Required ACTION S retains the CTS requirements of CTS Table 3.3-3 ACTION 15. This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours, increasing the allowed time to enter MODE 3 from 12 hours to 30 hours, and increases the allowance for entering MODE 5 from 42 hours (12 + 30) to 60 hours for inoperable Safety Injection, Containment Spray, or Containment Isolation Phase B Automatic Actuation Logic and Actuation Relays.

The purpose of CTS Table 3.3-3, ACTION 15 is to allow some time to restore the inoperable train before requiring a unit shutdown. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L04 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3, Functional Units 4 (Steam Line Isolation), 4.a. (Manual), 4.b. (Automatic Actuation Logic), 4.c. (Containment Pressure – High-High), and 4.d. (Steam Line Pressure – Low), are required to be OPERABLE in MODES 1, 2, and 3, while CTS Functional Unit 4.e. (Negative Steam Line Pressure Rate – High) is required to be OPERABLE in MODE 3. Note that CTS Table 3.3-3, Functional Units 4.d and 4.e have further limitations on OPERABILITY as delimitated in Note # and ##, respectively, that are not changing. ITS Table 3.3.2-1, Function 4. (Steam Line Isolation), 4.a (Manual Initiation), 4.b (Automatic Actuation Logic and Actuation Relays), 4.c (Containment Pressure High-High), 4.d.(1) (Steam Line Pressure Low), and 4.d.(2) (Steam Line Pressure Negative Rate – High) include a Footnote for MODES 2 and 3, Footnote (j). Footnote (j) states, "Except when all MSIVs are closed." This changes the CTS by making the Specification for these Functions not applicable in MODES 2 and 3 when all MSIVs are closed.

The purpose of the ITS Table 3.3.2-1 Function 4 Applicability is to provide an exception to clarify that the Steam Line Isolation instrumentation Functions are not required when the MSIVs are in a position that supports the safety analyses. This change is acceptable because the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. When all the MSIVs are in the closed position, they are in their assumed accident position, thus the isolation instrumentation is not needed. In addition, the MSIVs are not required to be OPERABLE in MODES 2 and 3 when the valves are closed, thus there is no purpose in requiring the instrumentation that closes the valves to be OPERABLE. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L05 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3 requires Functional Unit 5.a (Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High) and 5.b (Turbine Trip and Feedwater Isolation - Automatic Actuation Logic) to be OPERABLE in MODES 1, 2, and 3. ITS Table 3.3.2-1 requires the same Functions (ITS Table 3.3.2-1 Functions 5.a and 5.b) to be OPERABLE in MODE 1, and in MODES 2 and 3 except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve, Footnote (k). This changes the CTS by not requiring the instrumentation to be OPERABLE when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

The purpose of the ITS Table 3.3.2-1 Functions 5.a and 5.b Applicability is to provide an exception to clarify that the Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High (P-14) instrumentation and the Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays are not required when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. In this condition, the Function will not need to function since the valves are in a position that supports the safety analyses. This change is acceptable because the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. When all MFIVs, MFRVs, and MFRV bypass valves are in the closed position, they are in their assumed accident position. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L06 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3.3 footnote (a) is applicable to Functional Unit 6.f (Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump) "Minimum Channels OPERABLE" requirement. CTS Table 3.3.3 footnote (a) states that one channel may be inoperable during Mode 1 for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service. ITS 3.3.2 ACTION N is applicable Function 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps) and is modified by a similar Required Action Note. ITS 3.3.2 ACTION N Required Action Note states that one channel may be inoperable for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service. This changes the CTS by increasing the MODES in which this footnote relaxation is Applicable.

The purpose of CTS Table 3.3.3 footnote (a) is to prevent unnecessary entries into the ACTION statement during the normal evolution of starting or stopping a main feedwater pump. Making this relaxation Applicable in MODE 2 addresses the possibility that a situation may exist requiring starting or stopping of a main feedwater pump, preventing an unnecessary entry into the associated ACTION. This change is acceptable because the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis as the AFW auto-start function provides an anticipatory trip to reduce the effect of a feedwater transient. In addition, as in MODE 1, the evolution should be completed in less than 4 hours providing a reasonable allowance for operating contingencies. This change is designated as less restrictive because the Required Channel relaxation is applicable in more operating conditions than in the CTS.

L07 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3 ACTION 17, requires in part that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours. This action is applicable to CTS Table 3.3-3 Functional Units: 1.c (Containment Pressure – High); 1.d (Pressurizer Pressure – Low); 1.f (Steam Line Pressure – Low); 4.d (Steam Line Pressure – Low); 4.e (Negative Steam Line Pressure Rate – High); and 5.a (Steam Generator Water Level — High-High). ITS 3.3.2, Required Action D.1 require placing the associated channel in trip with a Completion Time of 72 hours for ITS Table 3.3.2-1 Functions 1.c (Containment Pressure – High); 1.d (Pressurizer Pressure – Low); 1.e (Steam Line Pressure – Low); 4.d.(1) (Steam Line Pressure – Low); 4.d.(2) (Negative Steam Line Pressure Rate – High); and 5.b (SG Water Level — High-High (P-14)). This changes the CTS by increasing the Completion Time for placing an inoperable channel for these Functional Units from six (6) hours to 72 hours.

The purpose of CTS Table 3.3-3 ACTION 17 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable or prior to being placed in a tripped state. 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. Additionally, this change is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L08 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3 ACTION 17 allows in part that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following listed conditions are satisfied but further states that the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1. This allowance is applicable to CTS Table 3.3-3 Functional Units 1.c (Containment Pressure – High); 1.d (Pressurizer Pressure – Low); 1.e (Steam Line Pressure – Low); 4.d.(1) (Steam Line Pressure – Low); 4.d.(2) (Negative Steam Line Pressure Rate – High); and 5.a (Steam Generator Water Level — High-High). ITS 3.3.2 ACTION D Required Actions are modified by a Note that states; "The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels." This allowance is applicable to ITS Table 3.3.2-1 Functional Units 1.c (Containment Pressure – High); 1.d (Pressurizer Pressure – Low); 1.f (Steam Line Pressure – Low); 4.d (Steam Line Pressure – Low); 4.e (Negative Steam Line Pressure Rate – High); and 5.a (Steam Generator Water Level — High-High). This changes the CTS by increasing the time allowed for these functions to be bypassed from 4 hours to 12 hours.

The purpose of CTS Table 3.3-3 ACTION 17 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable or prior to being placed in a tripped state. The proposed bypass time of 12 hours in ITS 3.3.2 ACTION D is a sufficient time to perform train or channel surveillance. The 12 hour period is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed for an inoperable channel to be bypassed for maintenance 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 3.3-3 ACTION 18, requires, in part, that with the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition within 6 hours. This action is applicable to CTS Table 3.3-3 Functional Units 2.c (Containment Pressure –- High-High); 3.b.3) (Containment Pressure –- High-High); 4.c (Containment Pressure –- High-High); 9.a (RWST Level – Low); and 9.a (Containment Sump Level – High). ITS Table 3.3.2-1 designates Condition E as the referenced Condition for Functions 2.c (Containment Pressure –- High-High), 3.b.(3) (Containment Pressure –- High-High), and 4.c (Containment Pressure –- High-High) while designating Condition P as the referenced Condition for Functions 7.b (RWST Level – Low) and 7.b (Containment Sump Level – High). ITS 3.3.2, Required Actions E.1 requires placing the associated channel in bypass with a Completion Time of 72 hours for ITS Table 3.3.2-1 Functions 2.c (Containment Pressure –- High-High), 3.b.(3) (Containment Pressure –- High-High), and 4.c (Containment Pressure –- High-High). ITS 3.3.2 Required Action P.1 retains the CTS Completion Time of 6 hours for placing the associated inoperable channel in bypass. This changes the CTS by increasing the Completion Time for placing an inoperable channel in bypass for these Functional Units from six (6) hours to 72 hours.

The purpose of CTS Table 3.3-3 ACTION 18 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable or prior to being placed in a bypassed state. 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. Additionally, this change is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L10 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3 ACTION 18 requires, in part, that with the number of OPERABLE channels one less than the Total Number of Channels operation may proceed provide the specified conditions are met but further states that one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1. This allowance is applicable to CTS Table 3.3-3 Functional Units 2.c (Containment Pressure – High-High); 3.b.3) (Containment Pressure – High-High); 4.c (Containment Pressure – High-High); 9.a (RWST Level – Low); and 9.a (Containment Sump Level – High). ITS Table 3.3.2-1 designates Condition E as the referenced Condition for Functions 2.c (Containment Pressure –- High-High), 3.b.(3) (Containment Pressure –- High-High), and 4.c (Containment Pressure –- High-High) while designating Condition P as the referenced Condition for Functions 7.b (RWST Level – Low) and 7.b (Containment Sump Level – High). ITS 3.3.2 ACTIONS E Required Actions are modified by a Note that states; "The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels." This allowance is applicable to ITS Table 3.3.2-1 Functional Units 2.c (Containment Pressure – High-High); 3.b.3) (Containment Pressure – High-High); 4.c (Containment Pressure – High-High); and 7.b (RWST Level – Low). ITS 3.3.2 Required Action Note retains the CTS inoperable channel bypass allowance of 4 hours for surveillance testing of other channels. This changes the CTS by increasing the time allowed for an additional channel to be bypassed for these Functional Units from 4 hours to 12 hours.

The purpose of CTS Table 3.3-3 ACTION 18 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable or prior to being placed in a bypassed state. The proposed bypass time of 12 hours in ITS 3.3.2 ACTION E is a sufficient time to perform train or channel surveillance. The 12 hour period is acceptable based on TVA's confirmation of applicability and incorporation of insights as described in Enclosure 4 of this submittal, required by the NRC in their letter and enclosed Safety Evaluation Report (SER) dated July 15, 1998, "Review of Westinghouse Owners Group Topical Reports WCAP-14333-P and WCAP-14334-NP, dated May 1995, 'Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times' (TAC NO. M92782)." This change is designated as less restrictive because additional time is allowed for an inoperable channel to be bypassed for maintenance than was allowed in the CTS.

L11 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3, ACTION 23 for Functional Units 4.b (Steam Line Isolation, Automatic Actuation Logic), 5.b (Turbine Trip & Feedwater Isolation, Automatic Actuation Logic), and 6.b (Auxiliary Feedwater, Automatic Actuation Logic) states, "With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.1." ITS 3.3.2, ACTION H for Functions 4.b (Steam Line Isolation, Automatic Actuation Logic and Actuation Relays), 5.a (Turbine Trip & Feedwater Isolation, Automatic Actuation Logic and Actuation Relays), and 6.a (Auxiliary Feedwater, Automatic Actuation Logic and Actuation Relays) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and MODE 4 within 36 hours; and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours and MODE 4 in additional 6 hours for an inoperable Steam Line Isolation, Automatic Actuation Logic, Turbine Trip & Feedwater Isolation, Automatic Actuation Logic, or Auxiliary Feedwater, Automatic Actuation Logic, plus increasing the allowed time a train can be bypassed for surveillance testing from 2 hours to 4 hours.

The purpose of CTS Table 3.3-3, ACTION 23 is to allow some time to restore the inoperable train before requiring a unit shut down. ITS LCO 3.3.2 ACTION G allows 24 hours to restore the train to an OPERABLE status and the Required Actions Note allows placing one train in the bypassed condition for up to 4 hours while performing routine surveillance testing provided the other train is OPERABLE. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA has performed evaluations of the applicable changes associated with the two

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WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L12 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-3 ACTION 37 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP. This action is applicable to CTS Functional Unit 6.c.i.c (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Motor-Driven Pumps, RCS Loop ∆T) and Functional Unit 6.c.ii.c (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Turbine-Driven Pump, RCS Loop ∆T). ITS 3.3.2 Required Action K.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

The purpose of CTS Table 3.3-3 ACTION 37 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection sets Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection set's SG Water Level Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action K.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-3 ACTION 37 and the proposed ITS Required Action K.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

L13 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-3 ACTION 38 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Functional Unit 6.c.i.d (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Motor-Driven Pumps, Containment Pressure (EAM)) and Functional Unit 6.c.ii.d (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Turbine-Driven Pump, Containment Pressure (EAM)).

ITS 3.3.2 Required Action J.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

The purpose of CTS Table 3.3-3 ACTION 38 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level -- Low-Low level channels in the tripped condition. Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action J.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-3 ACTION 38 and the proposed ITS Required Action J.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

L14 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-2 requires a CHANNEL FUNCTIONAL TEST on a quarterly basis (Q) for Functional Units: 1.c (Containment Pressure-High), 1.d (Pressurizer Pressure--Low); 1.f (Steam Line Pressure—Low); 2.c (Containment Pressure--High-High); 3.b.3) (Containment Pressure--High-High); 4.c (Containment Pressure--High-High); 4.d (Steam Line Pressure--Low); 4.e (Negative Steam Line Pressure Rate--High); and 5.a (Steam Generator Water Level--High-High). ITS Table 3.3.2-1 requires performance of a COT (ITS SR 3.3.1.7 or SR 3.3.1.8) every 184 days for Functions: 1.c (Containment Pressure-High); 1.d (Pressurizer Pressure--Low); 1.e (Steam Line Pressure—Low); 2.c (Containment Pressure--High-High); 3.b.(3) (Containment Pressure--High-High); 4.c (Containment Pressure--High-High); 4.d.(1) (Steam Line Pressure--Low); 4.d.(2) (Steam Line Pressure Negative Rate--High); and 5.b (SG Water Level--High-High (P-14)). This changes the CTS by changing the Frequency of the Surveillances from quarterly to 184 days.

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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated

October 1998, WCAP-15376-P-A, 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), or a unit specific evaluation showing the applicability of these WCAPs to the change. TVA 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 Enclosure 4 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.

L15 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-2 requires a CHANNEL FUNCTIONAL TEST on a monthly basis (M) for Functional Units: 1.b (Safety Injection, Automatic Actuation Logic); 2.b (Containment Spray, Automatic Actuation Logic); 3.b.2) (Containment Isolation, Automatic Actuation Logic); 4.b (Steam Line Isolation, Automatic Actuation Logic); 5.b (Turbine Trip and Feedwater Isolation, Automatic Actuation Logic); 6.b (Auxiliary Feedwater, Automatic Actuation Logic). A Note (Note (1)) modifies this Frequency and states, "Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS." The monthly CHANNEL FUNCTIONAL TEST in combination with the modifying Note requires testing each Automatic Actuation Logic train every two months. ITS Table 3.3.2-1 requires performance of an ACTUATION LOGIC TEST (ITS SR 3.3.2.2) every 92 days on a STAGGERED TEST BASIS for Functions: 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays); 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays); 3.b.(2) (Containment Isolation, Automatic Actuation Logic and Actuation Relays); 4.b (Steam Line Isolation, Automatic Actuation Logic and Actuation Relays); 5.a (Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays); and 6.a (Auxiliary Feedwater, Automatic Actuation Logic and Actuation Relays). This changes the CTS by changing the Frequency of the Surveillances from monthly (every 62 days on a STAGGERED TEST BASIS) for these Automatic Actuation Logics to every 92 days on a STAGGERED TEST BASIS.

The purpose of the Automatic Actuation Logic Test is to ensure that when various simulated or actual input combinations in conjunction with each possible interlock logic state required for OPERABILITY of a logic circuit are applied the required logic output is obtained. An important concept in this change is that the definition of STAGGERED TEST BASIS (STB) in CTS is not the same as in ITS. In CTS STAGGERED TEST BASIS is defined as, "A STAGGERED TEST BASIS shall consist of: a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval. Using the CTS STB definition there are two (2) Automatic Actuation Logic trains with the Note (1) frequency of 62 days on a STB, 62 days/2 trains = 31 days/train (or monthly), Table 4.3-2 Frequency. Therefore, in CTS, each month (31 days) an Automatic Actuation Logic train is tested and each Automatic Actuation Logic train is tested every two (2) months (62 days). In ITS, STB is defined as, "A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function." Using the ITS definition for the ITS SR 3.3.2.2 Frequency of "92 days on a STAGGERED TEST BASIS," changes the testing of each Automatic Actuation Logic and Actuation Relays train to every 6 months (184 days). The ITS STB definition requires an Automatic Actuation Logic and Actuation Relays Function to be tested every 62 days. Because there are two (2) Automatic Actuation Logic and Actuation Relays trains and the STB definition states that all designated trains are tested during *n* Surveillance Frequency Intervals where *n* is the number of trains, 92 days x 2 components = 184 days (or every 6 months). Therefore, this change decreases the Frequency for testing of each Automatic Actuation Logic and Actuation Relays train from every two months to every 6 months with the interaction between trains controlled by the STB definition. 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-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, 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). TVA 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 Enclosure 4 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.

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

3.3 INSTRUMENTATION

3.3.2~~A~~ Engineered Safety Feature Actuation System (ESFAS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.2.1

LCO 3.3.2~~A~~ The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE. ①

Applicability

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

---NOTE---

DOC A05

Separate Condition entry is allowed for each Function.

ACTION

Table 3.3-3 ACTION 20

CONDITION	REQUIRED ACTION	COMPLETION TIME
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
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Be in MODE 5.	84 hours

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 15	C. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. ---		③
		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	
ACTION 17	D. One channel inoperable.	~~[~~ ------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		③
		~~----------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.~~ ~~--]~~		④ ③
		D.1 Place channel in trip.	72 hours	
		OR		

CTS
Table 3.3-3

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.2A ①

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M07		D.2.1 Be in MODE 3.	78 hours	
		AND		
DOC M07		D.2.2 Be in MODE 4.	84 hours	
ACTION 18	E. One Containment Pressure channel inoperable.	[-----------------NOTE------------------ One additional channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		③
		~~----------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.~~ ~~---~~]		④ ③
		E.1 Place channel in bypass.	72 hours	
		OR		
DOC M08		E.2.1 Be in MODE 3.	78 hours	
		AND		
DOC M08		E.2.2 Be in MODE 4.	84 hours	
	INSERT 1			②
Table 3.3-1 ACTION 14 DOC L01	~~F~~G. One channel or train inoperable.	~~F~~G.1 Restore channel or train to OPERABLE status.	48 hours	② ②
		OR		
		~~F~~G.2.1 Be in MODE 3.	54 hours	②
		AND		

②

INSERT 1

ACTION 25

F. One channel inoperable.	F.1 Restore channel to OPERABLE status.	48 hours
	OR	
	F.2 Declare the associated Main Steam Isolation Valve inoperable.	48 hours

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M01		~~F~~G.2.2 Be in MODE 4.	60 hours	②
ACTION 23	~~G~~H. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. --		② ③
DOC L11		~~G~~H.1 Restore train to OPERABLE status.	24 hours	②
		OR		
		~~G~~H.2.1 Be in MODE 3.	30 hours	②
		AND		
		~~G~~H.2.2 Be in MODE 4.	36 hours	②
	~~H. One train inoperable.~~	~~--------------------NOTE-------------------~~ ~~One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE.~~ ~~--~~		②
		~~H.1 Restore train to OPERABLE status.~~	~~24 hours~~	
		~~OR~~		
		~~H.2 Be in MODE 3.~~	~~30 hours~~	

INSERT 2
INSERT 3
INSERT 4
INSERT 5
②

CTS
Table 3.3-3

② **INSERT 2**

ACTION 36

I. One channel inoperable.	-------------------NOTE------------------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --	
	I.1 For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for multiple affected steam generators (T_M).	4 hours
	AND	
	I.2 Place channel in trip.	6 hours

②

INSERT 3

ACTION 38	J. One channel inoperable.	J.1 For the affected protection set, adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).	6 hours
		OR	
DOC L13		J.2 For the affected protection set, place the Steam Generator Water Level-- Low-Low channel(s) in trip.	6 hours
		OR	
DOC M13		J.3.1 Be in MODE 3.	12 hours
		AND	
DOC M13		J.3.2 Be in MODE 4.	18 hours

CTS
Table 3.3-3

②

INSERT 4

ACTION 37	K. One channel inoperable.	K.1 For the affected protection set, adjust the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP.	6 hours
		OR	
DOC L12		K.2 For the affected protection set, place the Steam Generator Water level--Low-Low channel(s) in trip.	6 hours
		OR	
DOC M12		K.3.1 Be in MODE 3.	12 hours
		AND	
DOC M12		K.3.2 Be in MODE 4.	18 hours
ACTION 35.a	L. One voltage sensor channel inoperable.	L.1 Restore the inoperable channel to OPERABLE status.	6 hours
		OR	
		L.2 Declare the associated auxiliary feedwater pump inoperable.	6 hours

②

INSERT 5

ACTION 35.b

M. Two or more voltage sensor channels inoperable. OR One required load shed timer channel inoperable.	M.1.1 Restore all but one voltage sensor channel to an OPERABLE status.	1 hour
	AND	
	M.1.2 Restore required load shed timer channel to an OPERABLE status.	1 hour
	OR	
	M.2 Declare the associated auxiliary feedwater pump inoperable.	1 hour

CTS
Table 3.3-3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~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. ---]~~ ~~I.1 Place channel in trip.~~ ~~OR~~ ~~I.2 Be in MODE 3.~~	~~72 hours~~ ~~78 hours~~
N ~~J~~. One Main Feedwater Pumps trip channel inoperable.	INSERT 6 N ~~J~~.1 Restore channel to OPERABLE status. OR N ~~J~~.2 Be in MODE 3.	48 hours 54 hours

②

ACTION 20

INSERT 7 ②

SEQUOYAH UNIT 1
~~Westinghouse STS~~

Amendment XXX
~~Rev. 4.0~~ ② ①

②

INSERT 6

Table 3.3-3, Footnote (a)

----------------NOTE--------------
One channel may be inoperable for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service.
----

②

INSERT 7

ACTION 21

O. One channel inoperable.	O.1 Declare the associated auxiliary feedwater pump inoperable.	Immediately

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 18	~~K~~ P. 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.~~ ~~--]~~		② ③ ③ ④ ③
		~~K~~ P.1 Place channel in bypass.	~~[~~6~~]~~ hours	② ③
		OR		
DOC M09		~~K~~ P.2.1 Be in MODE 3.	~~[~~12~~]~~ hours	② ③
		AND		
DOC M09		~~K~~ P.2.2 Be in MODE 5.	~~[~~42~~]~~ hours	② ③
ACTION 22	~~L.~~ Q. One or more channels inoperable.	~~L~~ Q.1 Verify interlock is in required state for existing unit condition.	1 hour	②
		OR		
DOC A17		~~L~~ Q.2.1 Be in MODE 3.	7 hours	②
		AND		
DOC A17		~~L~~ Q.2.2 Be in MODE 4.	13 hours	②

INSERT 8 ②

②

INSERT 8

M11	R. Required Action and associated Completion Time of Condition I not met.	R.1 Be in MODE 3. AND R.2 Be in MODE 4.	6 hours 12 hours
ACTION 15	S. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. --- S.1 Be in MODE 3. AND S.2 Be in MODE 5.	12 hours 42 hours

SURVEILLANCE REQUIREMENTS

-----NOTE-----

4.3.2.1.1 Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

	SURVEILLANCE		FREQUENCY	
Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a, 6.c.1, 6.c.2, 6.c.3, 6.c.4, and 9.a	SR 3.3.2.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
Table 4.3-2 Functional Units 1.b, 2.b, 3.b.2, 4.b, 5.b, 6.b, and 9.b	SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
	~~SR 3.3.2.3~~	~~-----NOTE-----~~ ~~The continuity check may be excluded.~~ ~~----------~~ ~~Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	②

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
	---------------------------------~~REVIEWER'S NOTE-------------------------------~~ ~~The Frequency remains at 31 days on a STAGGERED TEST BASIS for plants with a Relay Protection System.~~ ~~---~~		④
DOC M04	SR 3.3.2.~~4~~ 3 Perform MASTER RELAY TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤
Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a, 6.c.1, 6.c.2, 6.c.3, 6.c.4, and 9.a	SR 3.3.2.~~5~~ 4 Perform COT.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤
DOC M04	SR 3.3.2.~~6~~ 5 Perform SLAVE RELAY TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
Table 4.3-2 Functional Unit 6.e.1 DOC A18	SR 3.3.2.~~7~~ 6 ② -----------------------------NOTE----------------------------- Verification of relay setpoints not required. --- Perform TADOT.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑤
Table 4.3-2 Functional Units 1.a, 2.a, 3.a.1, 3.b.1, 4.a, and 6.f DOC A18	SR 3.3.2.~~8~~ 7 ② -----------------------------NOTE----------------------------- Verification of setpoint not required for manual initiation functions. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑤

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.3.2.1.2 Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a,6.c.1, 6.c.2, 6.c.3, 6.c.4, 6.e.1, 6.e.2, 6.g, 6.h, 8.a, and 9.a. DOC A19	SR 3.3.2.~~9~~ 8	-----------------------------NOTE----------------------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤
4.3.2.1.3 DOC A20	SR 3.3.2.~~10~~ 9	-----------------------------NOTE----------------------------- Not required to be performed for the turbine driven AFW pump until ~~[~~24~~]~~ hours after SG pressure is ≥ ~~[1000]~~ 842 psig. --- Verify ESFAS RESPONSE TIMES are within limit.	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ③ ⑤
Table 4.3-1 Functional Unit 22 DOC A18	SR 3.3.2.~~11~~ 10	-----------------------------NOTE----------------------------- Verification of setpoint not required. --- Perform TADOT.	Once per reactor trip breaker cycle	②

Table 3.3-3

Table 3.3.2-1 (page 1 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~	③
	1. Safety Injection							
1.a	a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.~~8~~ 7	NA	NA	②
1.b	b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	
1.c	c. Containment Pressure - High ~~1~~	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≤ ~~[3.86]~~ 1.6 psig	~~[3.6]~~ 1.54 psig	③ ②
1.d	d. Pressurizer Pressure - Low	1,2,3 $^{(a)}$	~~[~~3~~]~~	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≥ ~~[1839]~~ 1864.8 psig	~~[1850]~~ 1870 psig	③ ②
1.f	e. Steam Line Pressure							
	~~(1)~~ - Low	1,2,3 ~~[~~$^{(a)}$~~]~~	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≥ [~~635]~~ 592.2$^{(d)}$ psig	~~[675]~~ 600$^{(d)}$ psig	③
	~~(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~~ ~~(b)(c)~~ ~~SR 3.3.2.9~~ ~~(b)(c)~~ ~~SR 3.3.2.10~~	~~≤ [106] psig~~	~~[97] psig~~	②

Note #
(a) Above the P-11 (Pressurizer Pressure) interlock.

3.3.2.1, and ACTION
(b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION
(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

Table 3.3-4 Note 1
(d) Time constants used in the lead/lag controller are ~~t~~ τ$_1$ ≥ ~~[~~50~~]~~ seconds and ~~t~~ τ$_2$ ≤ ~~[~~5~~]~~ seconds. ② ③

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 2 of 11)
Engineered Safety Feature Actuation System Instrumentation

③

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(f)}$~~ TRIP SETPOINT~~]~~
~~1. Safety Injection~~						
~~f. High Steam Flow in Two Steam Lines~~	~~1,2,3$^{(e)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with T_{avg} - Low Low~~	~~1,2,3$^{(e)}$~~	~~1 per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~g. High Steam Flow in Two Steam Lines~~	~~1,2,3$^{(e)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with Steam Line Pressure - Low~~	~~1,2,3$^{(e)}$~~	~~1 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [635]$^{(d)}$ psig~~	~~[675] psig~~
2. Containment Spray						
a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.~~8~~7	NA	NA

② (Safety Injection rows)

2.a ② (Containment Spray row)

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(d) Time constants used in the lead/lag controller are t_1 ≥ [50] seconds and t_2 ≤ [5] seconds.~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(f) 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.~~

~~(g) 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.~~

②

~~REVIEWER'S NOTE~~

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

④

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.2~~A~~

Table 3.3-3

Table 3.3.2-1 (page 3 of 11)
Engineered Safety Feature Actuation System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(‡)~~ TRIP SETPOINT~~]~~ ③	
	2. Containment Spray							
2.b	b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	②
2.c	c. Containment Pressure ~~High~~ - ~~3 (~~High - High~~)~~	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	≤ ~~[12.31~~ 2.9] psig	~~[12.05]~~ 2.81 psig	③ ②
	~~d. Containment Pressure High - 3 (Two Loop Plants)~~	~~1,2,3~~	~~[3] sets of [2]~~	~~E~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≤ [12.31] psig~~	~~[12.05] psig~~	
	3. Containment Isolation							
3.a	a. Phase A Isolation							
3.a.1)	(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.~~8~~ 7	NA	NA	②
DOC M05	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	
3.a.2)	(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

~~REVIEWER'S NOTE~~ ④

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

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.2~~A~~

Table 3.3-3

Table 3.3.2-1 (page 4 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~ ③
	3. Containment Isolation						
3.b.	b. Phase B Isolation						
3.b.1)	(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.~~8~~ 7	NA	NA ②
3.b.2)	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA
3.b.3)	(3) Containment Pressure ~~High - 3 (~~High High~~)~~	1,2,3	~~[~~4~~]~~	E	SR 3.3.2.1(b)(c) SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8 SR 3.3.2.~~10~~ 9	≤ ~~[12.31]~~ 2.9 psig	~~[12.05]~~ 2.81 psig ③
	4. Steam Line Isolation						
4.a	a. Manual Initiation	1,2 ~~(j)~~ (e),3 ~~(j)~~ (e)	~~2~~ 1 per steam line	F	SR 3.3.2.~~8~~ 7	NA	NA ②
4.b	b. Automatic Actuation Logic and Actuation Relays	1,2 ~~(j)~~ (e),3 ~~(j)~~ (e)	2 trains	~~G~~ H	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA
4.c	c. Containment Pressure - High -High ~~2~~	1,2 ~~(j)~~ (e),3 ~~(j)~~ (e)	~~[~~4~~]~~	~~D~~ E	SR 3.3.2.1(b)(c) SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8 SR 3.3.2.~~10~~ 9	≤ ~~[6.61]~~ 2.9 psig	~~[6.35]~~ 2.81 psig ③ ②

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

DOC L04 (~~j~~ e) Except when all MSIVs are closed ~~and [de-activated]~~. ③

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 5 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL(~~f~~) TRIP SETPOINT~~]~~ ③
	4. Steam Line Isolation						
	d. Steam Line Pressure						
4.d	(1) Low	1,2(~~j~~ e),3(~~j~~ e) (~~a~~ f)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8(b)(c) SR 3.3.2.~~10~~ 9	≥ ~~[635]~~ 592.2(d) psig	~~[675]~~ 600(d) psig ③
4.e	(2) Negative Rate - High	3 (~~h~~ g) (~~j~~ e)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8(b)(c) SR 3.3.2.~~10~~ 9	≤ ~~[121.6]~~ 107.8(~~i~~ h) psi	~~[110]~~ 100.0(~~i~~ h) psi ③

②

Note # (~~a~~ f) ~~Above the P-11 (Pressurizer Pressure) interlock~~ When Steam Line Isolation on Steam Line Pressure, Negative Rate–High is blocked.

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

Table 3.3-4 Note 1 (d) Time constants used in the lead/lag controller are ~~t~~ τ$_1$ ≥ ~~[~~50~~]~~ seconds and ~~t~~ τ$_2$ ≤ ~~[~~5~~]~~ seconds. ② ③

Table 3.3-3 Note ## (~~h~~ g) ~~Below the P-11 (Pressurizer Pressure) interlock~~ When Steam Line Isolation on Steam Line Pressure, Low is blocked. ②

Table 3.3-4 Note 2 (~~i~~ h) Time constant utilized in the rate/lag controller is ≥ ~~[~~50~~]~~ seconds. ③

DOC L04 (~~j~~ e) Except when all MSIVs are closed ~~and [de-activated]~~. ③

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 6 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(l)}$~~ TRIP SETPOINT~~]~~ ③
4. Steam Line Isolation						
~~e. High Steam Flow in Two Steam Lines~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with T_{avg} - Low Low~~	~~1,2$^{(j)}$,3$^{(e)(j)}$~~	~~1 per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~f. High Steam Flow in Two Steam Lines~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with Steam Line Pressure - Low~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~1 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [635]$^{(d)}$ psig~~	~~[675]$^{(d)}$ psig~~

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(d) Time constants used in the lead/lag controller are t_1 ≥ [50] seconds and t_2 ≤ [5] seconds.~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(f) 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.~~

~~(g) 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.~~

~~(j) Except when all MSIVs are closed and [de-activated].~~

②

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

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

~~-----~~

④

Table 3.3-3

Table 3.3.2-1 (page 7 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(l)}$~~ TRIP SETPOINT~~]~~ ③
4. Steam Line Isolation						
~~g. High Steam Flow~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [25]% of full steam flow at no load steam pressure~~	~~[ ] full steam flow at no load steam pressure~~
~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					
~~and~~						
~~Coincident with T_{avg} - Low Low~~	~~1,2$^{(j)}$,3$^{(e)(j)}$~~	~~[2] per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~h. High High Steam Flow~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [130]% of full steam flow at full load steam pressure~~	~~[ ] of full steam flow at full load steam pressure~~
~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					

②

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(j) Except when all MSIVs are closed and [de-activated].~~

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.2~~A~~

Table 3.3-3

Table 3.3.2-1 (page 8 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(i)~~ TRIP SETPOINT~~]~~ ③
	5. Turbine Trip and Feedwater Isolation						
5.b	a. Automatic Actuation Logic and Actuation Relays	1, 2 (k),~~[3]~~ (~~k~~) i	2 trains	H~~[G]~~	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA ③ ②
5.a	b. SG Water Level - High High (P-14)	1,2 (k),~~[3]~~(~~k~~) i	~~[~~3~~]~~ per SG	~~[~~D~~]~~	SR 3.3.2.1(b)(c) SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 SR 3.3.2.~~10~~ 9	≤ ~~[84.2]~~ 81.7%	~~[82.4]~~ 81% ③
DOC A08	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
	6. Auxiliary Feedwater						
6.b	a. Automatic Actuation Logic and Actuation Relays ~~(Solid State Protection System)~~	1,2,3	2 trains	~~G~~ H	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA ②
	~~b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.3~~	~~NA~~	~~NA~~

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

DOC L05 (~~k~~ i) Except when all MFIVs, MFRVs, ~~[~~and ~~associated~~ MFRV bypass valves~~]~~ are closed ~~and [de-activated]~~ ~~[~~or isolated by a closed manual valve~~]~~. ③

~~REVIEWER'S NOTE~~

~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3
Table 3.3-4
Table 4.3-2

Table 3.3.2-1 (page 9 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~ ③	
	6. Auxiliary Feedwater							
6.c	~~c~~ b. SG Water Level - Low Low INSERT 9 INSERT 10	~~1,2,3~~	~~[3] per SG~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5~~~~(b)(c)~~ ~~SR 3.3.2.9~~~~(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [30.4]%~~	~~[32.2]%~~	⑥ ⑥
6.d	~~d~~ c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						②
6.e	~~e~~ d. Loss of Offsite Power INSERT 11	~~1,2,3~~	~~[3] per bus~~	~~F~~	~~SR 3.3.2.7~~ ~~SR 3.3.2.9~~~~(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [2912] V with ≤ 0.8 sec time delay~~	~~[2975] V with ≤ 0.8 sec time delay~~	⑦
	~~f. Undervoltage Reactor Coolant Pump~~	~~1,2~~	~~[3] per bus~~	~~I~~	~~SR 3.3.2.7~~ ~~SR 3.3.2.9~~~~(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [69]% bus voltage~~	~~[70]% bus voltage~~	
6.f	~~g~~ e. Trip of all Main Feedwater Pumps	1,2 (k)	~~[2]~~ 1 per pump	~~J~~ N	SR 3.3.2.~~8~~ 7 ~~(b)(c)~~ ~~SR 3.3.2.9~~~~(b)(c)~~ SR 3.3.2.~~10~~ 9	~~≥ [ ] psig~~ NA	~~[ ] psig~~ NA	③ ②
6.g	~~h~~ f. Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	~~[2]~~ 3 per pump	~~F~~ O	~~SR 3.3.2.1~~ ~~SR 3.3.2.7~~ SR 3.3.2.~~9~~ 8 (b)(c)	~~≥ [20.53] [psia]~~ INSERT 12	~~[ ] [psia]~~ INSERT 12	③
	INSERT 13							②
9.	7. Automatic Switchover to Containment Sump							
9.b	a. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	~~C~~ S	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	②

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③ ⑧

INSERT 14

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

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INSERT 9

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 Table 3.3-4 Table 4.3-2							
6.c.i.a 6.c.ii.a	(1) Adverse	1,2,3	3 per SG	I	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$ SR 3.3.2.9	≥ 14.4% NR Span	15.0% NR Span
6.c.i.d 6.c.ii.d	Coincident with Containment Pressure (EAM)	1,2,3	4	J	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$	≤ 0.6 psig	0.5 psig
6.c.i.c 6.c.ii.c	and RCS Loop ΔT	1,2,3	4	K	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 3.3-4 6.c.i	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3 Table 3.3.1-1)	T_S (Note 3 Table 3.3.1-1)
Table 3.3-4 6.c.i	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3 Table 3.3.1-1)	T_m (Note 3 Table 3.3.1-1)

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Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
6.c.i.b 6.c.ii.b	(2) EAM	1,2,3	3 per SG	I	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$ SR 3.3.2.9	≥ 10.1% NR Span	10.7% NR Span
6.c.i.c 6.c.ii.c	Coincident with RCS Loop ΔT	1,2,3	4	K	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 3.3-4 6.c.i	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3 Table 3.3.1-1)	T_S (Note 3 Table 3.3.1-1)
Table 3.3-4 6.c.i	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3 Table 3.3.1-1)	T_m (Note 3 Table 3.3.1-1)

⑦

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Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 6.e.1	(1) Voltage Sensors	1,2,3	3 per shutdown board$^{(j)}$	L,M	SR 3.3.2.6 SR 3.3.2.8$^{(b)(c)}$ SR 3.3.2.9	Refer to Function 1 of Table 3.3.5-1 for setpoints and allowable values.	
Table 3.3-3 6.e.2	(2) Load Shed Timer	1,2,3	1 per shutdown board$^{(j)}$	M	SR 3.3.2.8$^{(b)(c)}$ SR 3.3.2.9	Refer to Function 1 of Table 3.3.5-1 for setpoints and allowable values.	

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	Allowable Value	Nominal Trip Setpoint
Table 3.3-4 6.g	≥ 2.44 psig (motor driven pump)	3.21 psig (motor driven pump)
	≥ 12 psig (turbine driven pump)	13.9 psig (turbine driven pump)

②

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Table 3.3-3
Table 3.3-4
Table 4.3-2

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 6.h	g. Auxiliary Feedwater Suction Transfer Time Delays						
Table 3.3-3 6.h.1	(1) Motor-Driven Pump	1,2,3	1 per pump	O	SR 3.3.2.8$^{(b)(c)}$	≤ 4.4 seconds and ≥ 3.6 seconds	4 seconds
Table 3.3-3 6.h.2	(2) Turbine-Driven Pump	1,2,3	2 per pump	O	SR 3.3.2.8$^{(b)(c)}$	≤ 6.05 seconds and ≥ 4.95 seconds	5.5 seconds

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INSERT 14

Table 3.3-3 Note ** — (j) Unit 1[2] shutdown boards only.

Table 3.3-3 Note (b) — (k) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

Table 3.3-3
Table 3.3-4
Table 4.3-2

Table 3.3.2-1 (page 10 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL TRIP SETPOINT~~]~~ ~~(l)~~ ③
9.	7. Automatic Switchover to Containment Sump						
	~~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(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [15]% and ≤ [ ]%~~	~~[ ]% and [ ]%~~ ②
	~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					
9.a.	~~c.~~ b. RWST Level - Low ~~Low~~	1,2,3,4	4	~~K~~ P	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	~~≥ [15]%~~ ≤ 132.71" and ≥ 127.29" from tank base	~~[18]%~~ 130" from tank base ③
	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~~ P	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	≤ 31.68 in and ≥ 28.32 ~~≥ [30]~~ in. above el. ~~[703]~~ 680 ft	~~[ ]~~ 30 in. above el. ~~[ ]~~ 680 ft ② ③

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-1
Table 4.3-1

Table 3.3.2-1 (page 11 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(I)~~ TRIP SETPOINT~~]~~ ③
8. ESFAS Interlocks						
22.G. a. Reactor Trip, P-4	1,2,3	1 per train, 2 trains	~~F~~ G	SR 3.3.2.~~11~~ 10	NA	NA
~~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~~

②

INSERT 15

~~REVIEWER'S NOTE~~

~~(I) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

②

INSERT 15

Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-2, 8.a Table 4.3-2, 8.a	b. Pressurizer Pressure, P-11/Not P-11						
Table 3.3-4, 8.a.1	(1) Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1,2,3	3	Q	SR 3.3.2.8	≤ 1975.2 psig	1970 psig
Table 3.3-4, 8.a.2	(2) P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1,2,3	3	Q	SR 3.3.2.8	≥ 1956.8 psig	1962 psig

3.3 INSTRUMENTATION

3.3.2~~A~~ Engineered Safety Feature Actuation System (ESFAS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.2 LCO 3.3.2~~A~~ The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE. ①

Applicability APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

---NOTE---

DOC A05 Separate Condition entry is allowed for each Function.

ACTION

Table 3.3-3 ACTION 20

CONDITION	REQUIRED ACTION	COMPLETION TIME
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
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Be in MODE 5.	84 hours

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 15	C. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. ---		③
		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	
ACTION 17	D. One channel inoperable.	~~[~~ ------------------NOTE------------------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		③
		~~----------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.~~ ~~---]~~		④ ③
		D.1 Place channel in trip.	72 hours	
		OR		

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M07		D.2.1 Be in MODE 3.	78 hours	
		AND		
DOC M07		D.2.2 Be in MODE 4.	84 hours	
ACTION 18	E. One Containment Pressure channel inoperable.	~~[~~ ------------------NOTE------------------ One additional channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---		③
		~~----------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.~~ ~~---]~~		④ ③
		E.1 Place channel in bypass.	72 hours	
		OR		
DOC M08		E.2.1 Be in MODE 3.	78 hours	
		AND		
DOC M08		E.2.2 Be in MODE 4.	84 hours	
	INSERT 1			②
Table 3.3-1 ACTION 14 DOC L01	~~F~~G. One channel or train inoperable.	~~F~~G.1 Restore channel or train to OPERABLE status.	48 hours	②
		OR		
		~~F~~G.2.1 Be in MODE 3.	54 hours	②
		AND		

CTS
Table 3.3-3

②

INSERT 1

ACTION 25

F. One channel inoperable.	F.1	Restore channel to OPERABLE status.	48 hours
	OR		
	F.2	Declare the associated Main Steam Isolation Valve inoperable.	48 hours

CTS
Table 3.3-3

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M01		~~F~~G.2.2 Be in MODE 4.	60 hours	②
ACTION 23	~~G~~H. One train inoperable.	--------------------NOTE------------------ One train may be bypassed for up to ~~[~~4~~]~~ hours for surveillance testing provided the other train is OPERABLE. ---		② ③
DOC L11		~~G~~H.1 Restore train to OPERABLE status.	24 hours	②
		OR		
		~~G~~H.2.1 Be in MODE 3.	30 hours	②
		AND		
		~~G~~H.2.2 Be in MODE 4.	36 hours	②
	~~H. One train inoperable.~~	~~--------------------NOTE------------------~~ ~~One train may be bypassed for up to [4] hours for surveillance testing provided the other train is OPERABLE.~~ ~~---~~		②
		~~H.1 Restore train to OPERABLE status.~~	~~24 hours~~	
		~~OR~~		
		~~H.2 Be in MODE 3.~~	~~30 hours~~	

INSERT 2
INSERT 3
INSERT 4
INSERT 5
②

CTS
Table 3.3-3

② **INSERT 2**

ACTION 36

I. One channel inoperable.	-------------------NOTE------------------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --	
	I.1 For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for multiple affected steam generators (T_M).	4 hours
	AND	
	I.2 Place channel in trip.	6 hours

CTS
Table 3.3-3

②

INSERT 3

ACTION 38	J. One channel inoperable.	J.1 For the affected protection set, adjust the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).	6 hours
		OR	
DOC L13		J.2 For the affected protection set, place the Steam Generator Water Level-- Low-Low channel(s) in trip.	6 hours
		OR	
DOC M13		J.3.1 Be in MODE 3.	12 hours
		AND	
DOC M13		J.3.2 Be in MODE 4.	18 hours

CTS
Table 3.3-3

②

INSERT 4

ACTION 37	K. One channel inoperable.	K.1 For the affected protection set, adjust the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP.	6 hours
		OR	
DOC L12		K.2 For the affected protection set, place the Steam Generator Water level--Low-Low channel(s) in trip.	6 hours
		OR	
DOC M12		K.3.1 Be in MODE 3.	12 hours
		AND	
DOC M12		K.3.2 Be in MODE 4.	18 hours
ACTION 35.a	L. One voltage sensor channel inoperable.	L.1 Restore the inoperable channel to OPERABLE status.	6 hours
		OR	
		L.2 Declare the associated auxiliary feedwater pump inoperable.	6 hours

CTS
Table 3.3-3

②

INSERT 5

ACTION 35.b

M. Two or more voltage sensor channels inoperable. OR One required load shed timer channel inoperable.	M.1.1 Restore all but one voltage sensor channel to an OPERABLE status. AND M.1.2 Restore required load shed timer channel to an OPERABLE status. OR M.2 Declare the associated auxiliary feedwater pump inoperable.	1 hour 1 hour 1 hour

CTS
Table 3.3-3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~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. ---]~~ ~~I.1 Place channel in trip.~~ ~~OR~~ ~~I.2 Be in MODE 3.~~	~~72 hours~~ ~~78 hours~~ ②
ACTION 20 N ~~J~~. One Main Feedwater Pumps trip channel inoperable.	N ~~J~~.1 Restore channel to OPERABLE status. INSERT 6 OR N ~~J~~.2 Be in MODE 3.	48 hours ② 54 hours ②

INSERT 7 ②

②

INSERT 6

Table 3.3-3, Footnote (a)

----------------NOTE--------------
One channel may be inoperable for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service.
----

②

INSERT 7

ACTION 21

O. One channel inoperable.	O.1 Declare the associated auxiliary feedwater pump inoperable.	Immediately

CTS
Table 3.3-3

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.2A

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 18	~~K~~P. 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.~~ ~~---]~~		② ③ ③ ④ ③
		~~K~~P.1 Place channel in bypass.	~~[~~6~~]~~ hours	② ③
		OR		
DOC M09		~~K~~P.2.1 Be in MODE 3.	~~[~~12~~]~~ hours	② ③
		AND		
DOC M09		~~K~~P.2.2 Be in MODE 5.	~~[~~42~~]~~ hours	② ③
ACTION 22	~~L.~~Q. One or more channels inoperable.	~~L~~Q.1 Verify interlock is in required state for existing unit condition.	1 hour	②
		OR		
DOC A17		~~L~~Q.2.1 Be in MODE 3.	7 hours	②
		AND		
DOC A17		~~L~~Q.2.2 Be in MODE 4.	13 hours	②

INSERT 8 ②

②

INSERT 8

M11	R. Required Action and associated Completion Time of Condition I not met.	R.1 Be in MODE 3. AND R.2 Be in MODE 4.	6 hours 12 hours
ACTION 15	S. One train inoperable.	--------------------NOTE------------------- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -- S.1 Be in MODE 3. AND S.2 Be in MODE 5.	12 hours 42 hours

SURVEILLANCE REQUIREMENTS

4.3.2.1.1

---NOTE---
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

	SURVEILLANCE		FREQUENCY	
Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a, 6.c.1, 6.c.2, 6.c.3, 6.c.4, and 9.a	SR 3.3.2.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
Table 4.3-2 Functional Units 1.b, 2.b, 3.b.2, 4.b, 5.b, 6.b, and 9.b	SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
	~~SR 3.3.2.3~~	~~-----------------------------NOTE-----------------------------~~ ~~The continuity check may be excluded.~~ ~~---~~ ~~Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	②

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
	~~-----REVIEWER'S NOTE-----~~ ~~The Frequency remains at 31 days on a STAGGERED TEST BASIS for plants with a Relay Protection System.~~ ~~-----~~		④
DOC M04	SR 3.3.2.~~4~~ 3 Perform MASTER RELAY TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ② ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a, 6.c.1, 6.c.2, 6.c.3, 6.c.4, and 9.a	SR 3.3.2.~~5~~ 4 Perform COT.	~~[184 days~~ ② ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤
DOC M04	SR 3.3.2.~~6~~ 5 Perform SLAVE RELAY TEST.	~~[[92] days~~ ② ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
Table 4.3-2 Functional Unit 6.e.1 DOC A18	SR 3.3.2.~~7~~ 6 ------------------------------NOTE------------------------------ Verification of relay setpoints not required. -- Perform TADOT.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤
Table 4.3-2 Functional Units 1.a, 2.a, 3.a.1, 3.b.1, 4.a, and 6.f DOC A18	SR 3.3.2.~~8~~ 7 ------------------------------NOTE------------------------------ Verification of setpoint not required for manual initiation functions. -- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
4.3.2.1.2 Table 4.3-2 Functional Units 1.c, 1.d, 1.f, 2.c, 3.b.3, 4.c, 4.d, 4.e, 5.a,6.c.1, 6.c.2, 6.c.3, 6.c.4, 6.e.1, 6.e.2, 6.g, 6.h, 8.a, and 9.a. DOC A19	SR 3.3.2.~~9~~ 8 -----------------------------NOTE----------------------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ⑤
4.3.2.1.3 DOC A20	SR 3.3.2.~~10~~ 9 -----------------------------NOTE----------------------------- Not required to be performed for the turbine driven AFW pump until ~~[~~24~~]~~ hours after SG pressure is ≥ ~~[1000]~~ 842 psig. --- Verify ESFAS RESPONSE TIMES are within limit.	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	② ③ ⑤
Table 4.3-1 Functional Unit 22 DOC A18	SR 3.3.2.~~11~~ 10 -----------------------------NOTE----------------------------- Verification of setpoint not required. --- Perform TADOT.	Once per reactor trip breaker cycle	②

Table 3.3-3

Table 3.3.2-1 (page 1 of 11)
Engineered Safety Feature Actuation System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(f)~~ TRIP SETPOINT~~]~~	③
	1. Safety Injection							
1.a	a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.~~8~~ 7	NA	NA	②
1.b	b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	
1.c	c. Containment Pressure - High ~~1~~	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≤ ~~[3.86]~~ 1.6 psig	~~[3.6]~~ 1.54 psig	③ ②
1.d	d. Pressurizer Pressure - Low	1,2,3 $^{(a)}$	~~[~~3~~]~~	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≥ ~~[1839]~~ 1864.8 psig	~~[1850]~~ 1870 psig	③ ②
1.f	e. Steam Line Pressure							
	~~(1)~~ - Low	1,2,3 ~~[~~$^{(a)}$~~]~~	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.~~5~~ 4$^{(b)(c)}$ SR 3.3.2.~~9~~ 8$^{(b)(c)}$ SR 3.3.2.~~10~~ 9	≥ [~~635]~~ 592.2$^{(d)}$ psig	~~[675]~~ 600$^{(d)}$ psig	③ ②
	~~(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$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [106] psig~~	~~[97] psig~~	

Note # (a) Above the P-11 (Pressurizer Pressure) interlock.

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

Table 3.3-4 Note 1 (d) Time constants used in the lead/lag controller are ~~t~~ τ$_1$ ≥ ~~[~~50~~]~~ seconds and ~~t~~ τ$_2$ ≤ ~~[~~5~~]~~ seconds. ② ③

~~REVIEWER'S NOTE~~

~~(f) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 2 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~ ③
~~1. Safety Injection~~						
~~f. High Steam Flow in Two Steam Lines~~	~~1,2,3 (e)~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with T_{avg} - Low Low~~	~~1,2,3 (e)~~	~~1 per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~g. High Steam Flow in Two Steam Lines~~	~~1,2,3 (e)~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with Steam Line Pressure - Low~~	~~1,2,3 (e)~~	~~1 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [635](d) psig~~	~~[675] psig~~
2. Containment Spray						
a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.~~8~~ 7	NA	NA

②

2.a ②

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(d) Time constants used in the lead/lag controller are t_1 ≥ [50] seconds and t_2 ≤ [5] seconds.~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(f) 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.~~

~~(g) 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.~~

②

~~REVIEWER'S NOTE~~

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

④

Table 3.3-3

Table 3.3.2-1 (page 3 of 11)
Engineered Safety Feature Actuation System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(t)}$~~ TRIP SETPOINT~~]~~ ③
	2. Containment Spray						
2.b	b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~3 SR 3.3.2.~~6~~5	NA	NA ②
2.c	c. Containment Pressure ~~High~~ - ~~3 (~~High - High~~)~~	1,2,3	4	E	SR 3.3.2.1 SR 3.3.2.~~5~~4$^{(b)(c)}$ SR 3.3.2.~~9~~8$^{(b)(c)}$ SR 3.3.2.~~10~~9	≤ ~~[12.31~~2.9] psig	~~[12.05]~~2.81 psig ③ ②
	~~d. Containment Pressure High - 3 (Two Loop Plants)~~	~~1,2,3~~	~~[3] sets of [2]~~	~~E~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [12.31] psig~~	~~[12.05] psig~~
	3. Containment Isolation						
3.a	a. Phase A Isolation						
3.a.1)	(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.~~8~~7	NA	NA ②
DOC M05	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~3 SR 3.3.2.~~6~~5	NA	NA
3.a.2)	(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

~~REVIEWER'S NOTE~~

~~(t) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 4 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~	③
	3. Containment Isolation							
3.b.	b. Phase B Isolation							
3.b.1)	(1) Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.~~8~~ 7	NA	NA	②
3.b.2)	(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	②
3.b.3)	(3) Containment Pressure ~~High - 3 (~~High High~~)~~	1,2,3	~~[~~4~~]~~	E	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	≤ ~~[12.31]~~ 2.9 psig	~~[12.05]~~ 2.81 psig	③
	4. Steam Line Isolation							②
4.a	a. Manual Initiation	1,2 (~~j~~) e ,3 (~~j~~) e	~~2~~ 1 per steam line	F	SR 3.3.2.~~8~~ 7	NA	NA	②
4.b	b. Automatic Actuation Logic and Actuation Relays	1,2 (~~j~~) e ,3 (~~j~~) e	2 trains	~~G~~ H	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	②
4.c	c. Containment Pressure - High -High ~~2~~	1,2 (~~j~~) e ,3 (~~j~~) e	~~[~~4~~]~~	~~D~~ E	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	≤ ~~[6.61]~~ 2.9 psig	~~[6.35]~~ 2.81 psig	③ ②

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

DOC L04 (~~j~~) e Except when all MSIVs are closed ~~and [de-activated]~~. ③

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 5 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL^{~~(l)~~} TRIP SETPOINT~~]~~ ③
	4. Steam Line Isolation						
	d. Steam Line Pressure						
4.d	(1) Low	e 1,2 $^{(\cancel{j})}$,3 $^{(\cancel{j})}$ (~~a~~) f	3 per steam line	D	SR 3.3.2.1 4 SR 3.3.2.~~5~~ $^{(b)(c)}$ 8 SR 3.3.2.~~9~~ $^{(b)(c)}$ SR 3.3.2.~~10~~ 9	592.2 ≥ ~~[635]~~ $^{(d)}$ psig	600 ~~[675]~~ $^{(d)}$ psig ③
4.e	(2) Negative Rate - High	g 3 $^{(\cancel{h})}$ (~~j~~) e	3 per steam line	D	SR 3.3.2.1 4 SR 3.3.2.~~5~~ $^{(b)(c)}$ 8 SR 3.3.2.~~9~~ $^{(b)(c)}$ SR 3.3.2.~~10~~ 9	107.8 ≤ ~~[121.6]~~ $^{(\cancel{i})}$ psi h	100.0 ~~[110]~~ $^{(\cancel{i})}$ psi h ③

②

Note # (~~a~~) f ~~Above the P-11 (Pressurizer Pressure) interlock~~ When Steam Line Isolation on Steam Line Pressure, Negative Rate–High is blocked.

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

Table 3.3-4 Note 1 (d) Time constants used in the lead/lag controller are ~~t~~ τ$_1$ ≥ ~~[~~50~~]~~ seconds and ~~t~~ τ$_2$ ≤ ~~[~~5~~]~~ seconds. ② ③

Table 3.3-3 Note ## (~~h~~) g ~~Below the P-11 (Pressurizer Pressure) interlock~~ When Steam Line Isolation on Steam Line Pressure, Low is blocked. ②

Table 3.3-4 Note 2 (~~i~~) h Time constant utilized in the rate/lag controller is ≥ ~~[~~50~~]~~ seconds. ③

DOC L04 (~~j~~) e Except when all MSIVs are closed ~~and [de-activated]~~. ③

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 6 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(i)~~ TRIP SETPOINT~~]~~ ③
4. Steam Line Isolation						
~~e. High Steam Flow in Two Steam Lines~~	~~1,2 (j),3 (j)~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with T_{avg} - Low Low~~	~~1,2 (j),3 (e) (j)~~	~~1 per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~f. High Steam Flow in Two Steam Lines~~	~~1,2 (j),3 (j)~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~(f)~~	~~(g)~~
~~Coincident with Steam Line Pressure - Low~~	~~1,2 (j),3 (j)~~	~~1 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [635](d) psig~~	~~[675](d) psig~~

②

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(d) Time constants used in the lead/lag controller are t_1 ≥ [50] seconds and t_2 ≤ [5] seconds.~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(f) 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.~~

~~(g) 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.~~

~~(j) Except when all MSIVs are closed and [de-activated].~~

~~REVIEWER'S NOTE~~

~~(I) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3

Table 3.3.2-1 (page 7 of 11)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~$^{(l)}$~~ TRIP SETPOINT~~]~~ ③
4. Steam Line Isolation						
~~g. High Steam Flow~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [25]% of full steam flow at no load steam pressure~~	~~[ ] full steam flow at no load steam pressure~~
~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					
~~and~~						
~~Coincident with T_{avg} - Low Low~~	~~1,2$^{(j)}$,3$^{(e)(j)}$~~	~~[2] per loop~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≥ [550.6]°F~~	~~[553]°F~~
~~h. High High Steam Flow~~	~~1,2$^{(j)}$,3$^{(j)}$~~	~~2 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5$^{(b)(c)}$~~ ~~SR 3.3.2.9$^{(b)(c)}$~~ ~~SR 3.3.2.10~~	~~≤ [130]% of full steam flow at full load steam pressure~~	~~[ ] of full steam flow at full load steam pressure~~
~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					

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

~~(c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The NTSP and the methodologies used to determine the as-found and as-left tolerances are specified in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~

~~(e) Above the P-12 (T_{avg} - Low Low) interlock.~~

~~(j) Except when all MSIVs are closed and [de-activated].~~

②

~~REVIEWER'S NOTE~~

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

④

Table 3.3-3

Table 3.3.2-1 (page 8 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	[NOMINAL ~~(i)~~ TRIP SETPOINT]	③
	5. Turbine Trip and Feedwater Isolation							
5.b	a. Automatic Actuation Logic and Actuation Relays	1, 2 (k), [3] (~~k~~) i	2 trains	H~~[G]~~	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	③ ②
5.a	b. SG Water Level - High High (P-14)	1,2 (k), [3] (~~k~~) i	[3] per SG	~~I~~[D]	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 (b)(c) SR 3.3.2.~~9~~ 8 (b)(c) SR 3.3.2.~~10~~ 9	≤ ~~[84.2]~~ 81.7%	~~[82.4]~~ 81%	③
DOC A08	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.						
	6. Auxiliary Feedwater							
6.b	a. Automatic Actuation Logic and Actuation Relays ~~(Solid State Protection System)~~	1,2,3	2 trains	~~G~~ H	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA	②
	~~b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.3~~	~~NA~~	~~NA~~	

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

DOC L05 (~~k~~) i Except when all MFIVs, MFRVs, [and ~~associated~~ MFRV bypass valves] are closed ~~and [de-activated]~~ [or isolated by a closed manual valve]. ③

~~REVIEWER'S NOTE~~

~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-3
Table 3.3-4
Table 4.3-2

Table 3.3.2-1 (page 9 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~ ③
	6. Auxiliary Feedwater						
6.c	~~c.~~ b SG Water Level - Low Low INSERT 9 INSERT 10	~~1,2,3~~	~~[3] per SG~~	~~D~~	~~SR 3.3.2.1(b)(c)~~ ~~SR 3.3.2.5(b)(c)~~ ~~SR 3.3.2.9~~ ~~SR 3.3.2.10~~	~~≥ [30.4]%~~	~~[32.2]%~~ ⑥ ⑥
6.d	~~d.~~ c Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					②
6.e	~~e.~~ d Loss of Offsite Power INSERT 11	~~1,2,3~~	~~[3] per bus~~	~~F~~	~~SR 3.3.2.7~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [2912] V with ≤ 0.8 sec time delay~~	~~[2975] V with ≤ 0.8 sec time delay~~ ⑦
	~~f. Undervoltage Reactor Coolant Pump~~	~~1,2~~	~~[3] per bus~~	~~I~~	~~SR 3.3.2.7~~ ~~SR 3.3.2.9(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [69]% bus voltage~~	~~[70]% bus voltage~~
6.f	~~g.~~ e Trip of all Main Feedwater Pumps	1,2 (k)	~~[2]~~ 1 per pump	~~J~~ N	7 SR 3.3.2.~~8(b)(c)~~ ~~SR 3.3.2.9(b)(c)~~ SR 3.3.2.~~10~~ 9	~~≥ [ ] psig~~ NA	~~[ ] psig~~ NA ③ ②
6.g	~~h.~~ f Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low	1,2,3	~~[2]~~ 3 per pump	~~F~~ O	~~SR 3.3.2.1~~ ~~SR 3.3.2.7~~ 8 SR 3.3.2.~~9~~(b)(c)	INSERT 12 ~~≥ [20.53] [psia]~~	~~[ ] [psia]~~ ③
	INSERT 13						②
9.	7. Automatic Switchover to Containment Sump						
9.b	a. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	~~C~~ S	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA ②

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③ ⑧

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~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

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	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 Table 3.3-4 Table 4.3-2							
6.c.i.a 6.c.ii.a	(1) Adverse	1,2,3	3 per SG	I	SR 3.3.2.1 SR 3.3.2.4(b)(c) SR 3.3.2.8(b)(c) SR 3.3.2.9	≥ 14.4% NR Span	15.0% NR Span
6.c.i.d 6.c.ii.d	Coincident with Containment Pressure (EAM)	1,2,3	4	J	SR 3.3.2.1 SR 3.3.2.4(b)(c) SR 3.3.2.8(b)(c)	≤ 0.6 psig	0.5 psig
6.c.i.c 6.c.ii.c	and RCS Loop ΔT	1,2,3	4	K	SR 3.3.2.1 SR 3.3.2.4(b)(c) SR 3.3.2.8(b)(c)	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 3.3-4 6.c.i	with Time Delay T_S if one SG is affected					≤ (1.01)T_s (Note 3 Table 3.3.1-1)	T_S (Note 3 Table 3.3.1-1)
Table 3.3-4 6.c.i	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3 Table 3.3.1-1)	T_m (Note 3 Table 3.3.1-1)

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Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
6.c.i.b 6.c.ii.b	(2) EAM	1,2,3	3 per SG	I	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$ SR 3.3.2.9	≥ 10.1% NR Span	10.7% NR Span
6.c.i.c 6.c.ii.c	Coincident with RCS Loop ΔT	1,2,3	4	K	SR 3.3.2.1 SR 3.3.2.4$^{(b)(c)}$ SR 3.3.2.8$^{(b)(c)}$	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP	RCS Loop ΔT variable input 50% RTP
Table 3.3-4 6.c.i	with Time Delay T_S if one SG is affected					≤ (1.01)T_S (Note 3 Table 3.3.1-1)	T_S (Note 3 Table 3.3.1-1)
Table 3.3-4 6.c.i	or Time Delay T_m if two or more SGs are affected					≤ (1.01)T_m (Note 3 Table 3.3.1-1)	T_m (Note 3 Table 3.3.1-1)

⑦

INSERT 11

Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 6.e.1	(1) Voltage Sensors	1,2,3	3 per shutdown board(j)	L,M	SR 3.3.2.6 SR 3.3.2.8(b)(c) SR 3.3.2.9	Refer to Function 1 of Table 3.3.5-1 for setpoints and allowable values.	
Table 3.3-3 6.e.2	(2) Load Shed Timer	1,2,3	1 per shutdown board(j)	M	SR 3.3.2.8(b)(c) SR 3.3.2.9	Refer to Function 1 of Table 3.3.5-1 for setpoints and allowable values.	

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	Allowable Value	Nominal Trip Setpoint
Table 3.3-4 6.g	≥ 2.44 psig (motor driven pump)	3.21 psig (motor driven pump)
	≥ 12 psig (turbine driven pump)	13.9 psig (turbine driven pump)

②

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	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 Table 3.3-4 Table 4.3-2							
Table 3.3-3 6.h	g. Auxiliary Feedwater Suction Transfer Time Delays						
Table 3.3-3 6.h.1	(1) Motor-Driven Pump	1,2,3	1 per pump	O	SR 3.3.2.8$^{(b)(c)}$	≤ 4.4 seconds and ≥ 3.6 seconds	4 seconds
Table 3.3-3 6.h.2	(2) Turbine-Driven Pump	1,2,3	2 per pump	O	SR 3.3.2.8$^{(b)(c)}$	≤ 6.05 seconds and ≥ 4.95 seconds	5.5 seconds

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Table 3.3-3 Note **

(j) Unit 1[2] shutdown boards only.

Table 3.3-3 Note (b)

(k) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

Table 3.3-3
Table 3.3-4
Table 4.3-2

Table 3.3.2-1 (page 10 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(i)~~ TRIP SETPOINT~~]~~ ③
9.	7. Automatic Switchover to Containment Sump						
	~~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~~~~(b)(c)~~ ~~SR 3.3.2.9~~~~(b)(c)~~ ~~SR 3.3.2.10~~	~~≥ [15]% and ≤ [ ]%~~	~~[ ]% and [ ]%~~ ②
	~~Coincident with Safety Injection~~	~~Refer to Function 1 (Safety Injection) for all initiation functions and requirements.~~					
9.a.	b. ~~c.~~ RWST Level - Low ~~Low~~	1,2,3,4	4	~~K~~ P	SR 3.3.2.1 SR 3.3.2.~~5~~4(b)(c) SR 3.3.2.~~9~~8(b)(c) SR 3.3.2.~~10~~9	≤ 132.71" and ≥ 127.29" from tank base ~~≥ [15]%~~	130" from tank base ~~[18]%~~ ③
	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~~ P	SR 3.3.2.1 SR 3.3.2.~~5~~4(b)(c) SR 3.3.2.~~9~~8(b)(c) SR 3.3.2.~~10~~9	≤ 31.68 in and ≥ 28.32 ~~≥ [30]~~ in. above el. ~~[703]~~ 680 ft	~~[ ]~~ 30 in. above el. ~~[ ]~~ 680 ft ② ③

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ② ③

~~REVIEWER'S NOTE~~

~~(i) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

Table 3.3-1
Table 4.3-1

Table 3.3.2-1 (page 11 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~ ③
	8. ESFAS Interlocks						
22.G.	a. Reactor Trip, P-4	1,2,3	1 per train, 2 trains	~~F~~ G	SR 3.3.2.~~11~~ 10	NA	NA
	~~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~~ INSERT 15	~~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~~

②

~~REVIEWER'S NOTE~~

~~(l) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ ④

②

INSERT 15

Table 3.3-3 Table 3.3-4 Table 4.3-2	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-2, 8.a Table 4.3-2, 8.a	b. Pressurizer Pressure, P-11/Not P-11						
Table 3.3-4, 8.a.1	(1) Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1,2,3	3	Q	SR 3.3.2.8	≤ 1975.2 psig	1970 psig
Table 3.3-4, 8.a.2	(2) P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1,2,3	3	Q	SR 3.3.2.8	≥ 1956.8 psig	1962 psig

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

1. NUREG 1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0 provides two sets of specifications for Section 3.3.2; one for adoption "Without a Setpoint Control Program," (3.3.2.A) the other for adoption "With a Setpoint Control Program," (3.3.2.B). This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation and is removed.

2. 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, FUNCTIONS, and Footnotes.

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

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

5. ISTS SR 3.3.2.1, ISTS SR 3.3.2.2, ISTS SR 3.3.2.4, ISTS SR 3.3.2.5, ISTS SR 3.3.2.6, ISTS SR 3.3.2.7, ISTS SR 3.3.2.8, ISTS SR 3.3.2.9, and SR 3.3.2.10, provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, except for those frequencies that are event driven or related to specific conditions, the Frequencies for ITS SR 3.3.2.1, ITS SR 3.3.2.2, ITS SR 3.3.2.3, ITS SR 3.3.2.4, ITS SR 3.3.2.5, ITS SR 3.3.2.6, ITS SR 3.3.2.7, ITS SR 3.3.2.8, and ITS SR 3.3.2.9, are "In accordance with the Surveillance Frequency Control Program."

6. CTS Table 3.3-3, Table 4.3-2, and Table 3.3-4 include Functional Unit 6.c (Main Steam Generator Water Level—Low-Low). ISTS includes a similar Function, ISTS Function 6 (Steam Generator (SG) Water Level – Low Low), but does not include the Environmental Allowance Modifier (EAM) or the Trip Time Delay (TTD) features. Changes are made to present the CTS Functional Unit 6 in ISTS format.

7. CTS Table 3.3-3, Table 4.3-2, and Table 3.3-4 include Functional Unit 6.e.1 (Voltage Sensors) and Functional Unit 6.e.2 (Load Shed Timer). ISTS includes a similar Function, ISTS Function 6.e (Loss of Offsite Power), but does not include Voltage Sensor and Load Shed Timer features. Changes are made to present CTS Functional Units 6.e.1 and 6.e.2 in ISTS format.

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

8. CTS Table 3.3-3 includes Notes modifying Functional Units 6.e.1 (Voltage Sensors) and Functional Unit 6.e.2 (Load Shed Timer) (CTS Table 3.3-3 Note **) and Functional Unit 6.f (Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump) (Notes (a) and (b)). ISTS includes similar Functions, ISTS Function 6.e (Loss of Offsite Power) and ISTS Function 6.g (Trip of all Main Feedwater Pumps), but does not include these notes. Changes are made to present the CTS Notes in ISTS format.

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

B 3.3 INSTRUMENTATION

B 3.3.2~~A~~ Engineered Safety Feature Actuation System (ESFAS) Instrumentation ~~(Without Setpoint Control Program)~~ ①

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. 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 INSERT 1 "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a 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. 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 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.~~ ③

② INSERT 1

settings for automatic protective devices related to those variables having significant safety functions. The regulation also states,

BASES

BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note c of Table 3.3.2-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ ③

~~Where the [NTSP] is not included in Table 3.3.2-1, the plant-specific location for the [NTSP] must be cited in Note c of Table 3.3.2-1. The brackets indicate plant-specific terms may apply, as reviewed and approved by the NRC.~~

~~--~~

The ~~[~~Nominal Trip Setpoint (NTSP)~~]~~ specified in Table 3.3.2-1 is a ④ predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[~~NTSP~~]~~ accounts for uncertainties in setting the channel (e.g., calibration), ④ 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). ④

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 ④ 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 ④ 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 ④ protective action would still have ensured that the SL would not be exceeded with the "as-found" setting of the protection channel.

BASES

BACKGROUND (continued)

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 within the established as-left tolerance around the ~~[~~NTSP~~]~~ to account for further drift during the next surveillance interval. ④

~~[Note: Alternatively, a Technical Specification format incorporating an Allowable Value only column may be proposed by a licensee. In this case, the [NTSP] value and the methodologies used to calculate the as-found and as-left tolerances must be specified in [insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]. Changes to the actual plant trip setpoint or [NTSP] value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements.~~ ③

During Anticipated Operational Occurrences (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 SL value to prevent departure from nucleate boiling (DNB),
2. Fuel centerline melt shall not occur, and
3. The RCS pressure SL of ~~[~~2735~~]~~ psig shall not be exceeded. ④

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 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 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.

The ESFAS instrumentation is segmented into three distinct but interconnected modules as identified below:

- Field transmitters or process sensors and instrumentation: provide a measurable electronic signal based on the physical characteristics of the parameter being measured,

BASES

BACKGROUND (continued)

- Signal processing equipment including ~~analog~~ Process 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, and control board/control room/miscellaneous indications, and ②

- 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, setpoint comparator, or contact outputs from the signal process control and protection system. ②

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. In many cases, field transmitters or sensors that input to the ESFAS are shared with the Reactor Trip System (RTS). 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 ~~[~~NTSP~~]~~ and Allowable Value. 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. ④

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 analog to digital conversion (Digital Protection System), signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with ~~[~~NTSPs~~]~~ derived from Analytical Limits established by the safety analyses. Analytical Limits are defined in UFSAR, Chapter ~~[~~6~~]~~ (Ref. 2), Chapter ~~[~~7~~]~~ (Ref. 3), and Chapter ~~[~~15~~]~~ (Ref. 4). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable, setpoint comparator, or contact 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. ② ④ ② ④ ② ②

BACKGROUND (continued)

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.

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 3.

~~[~~NTSPs~~]~~ and ESFAS Setpoints ~~[~~Allowable Values~~]~~ ④

The trip setpoints used in the bistables, setpoint comparators, or contacts are based on the analytical limits ② stated in Reference 3. The calculation of the ~~[~~NTSPs~~]~~ specified in ④ Table 3.3.2-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 6), the Allowable Values specified in Table 3.3.2-1 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 ESFAS ~~[~~NTSPs~~]~~ including their explicit uncertainties, is provided in the plant ④ specific setpoint methodology study (Ref. 7) which incorporates all of the known uncertainties applicable to each channel. The as-left tolerance and as-found tolerance band methodology is provided in ~~[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~ UFSAR Section 7.1.2 ④. The magnitudes of these uncertainties are factored into the determination of each ESFAS ~~[~~NTSP~~]~~ and corresponding Allowable ④ Value. The nominal ESFAS setpoint entered ~~into the bistable~~ is more ② conservative than that specified by the ~~[NTSP]~~ Allowable Value ④ to account for measurement errors detectable by the CHANNEL OPERATIONAL TEST (COT). The Allowable Value serves as the as-found Technical Specification OPERABILITY limit for the purpose of the COT.

BASES

BACKGROUND (continued)

or setpoint comparators

or setpoint comparator

The ~~[~~NTSP~~]~~ is the value at which the bistables are set and is the expected value to be achieved during calibration. The ~~[~~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" ~~[~~NTSP~~]~~ value is within the as-left tolerance for CHANNEL CALIBRATION uncertainty allowance (i.e., + rack calibration and comparator setting uncertainties). The ~~[~~NTSP~~]~~ value is therefore considered a "nominal value" (i.e., expressed as a value without inequalities) for the purposes of the COT and CHANNEL CALIBRATION. ④ ② ④ ② ④ ④

~~[~~Nominal Trip Setpoints~~]~~, in conjunction with the use of as-found and as-left tolerances together 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. ④

Note that the Allowable Values listed in Table 3.3.2-1 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 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 SR section.

<u>Solid State Protection System</u>

, setpoint comparators, or contacts

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. ②

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.

BASES

BACKGROUND (continued)

The bistable , setpoint comparator, or contact 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. 2

Each SSPS train has a built in testing device that can automatically test the decision logic matrix functions and the actuation channels 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.

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.

~~-----------------------------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.~~
~~--~~ 3

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

actuation signal for small loss of coolant accidents (LOCAs) 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 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. 4).

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.

The LCO requires all instrumentation performing an ESFAS Function, listed in Table 3.3.2-1 in the accompanying LCO, to be OPERABLE. The Allowable Value specified in Table 3.3.2-1 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 COT. As such, the Allowable Value differs from the ~~[~~NTSP~~]~~ by an amount ~~[greater than or]~~ equal to the ④ 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 ④ 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).

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 ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

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 this 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. ④ ④

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.

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. <u>Safety Injection</u>

   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).

   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:

   - Phase A Isolation,
   - Containment ~~Purge~~ Ventilation Isolation, ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- Reactor Trip,
- ERCW and CCS Pump Start and System Isolation ②
- Turbine Trip,
- Feedwater Isolation,
- Start of motor driven auxiliary feedwater (AFW) pumps,
- Control room ventilation isolation, and
- Enabling automatic switchover of Emergency Core Cooling Systems (ECCS) suction to containment sump.

These other functions ensure:

- Isolation of nonessential systems through containment penetrations,
- Trip of the turbine and reactor to limit power generation,
- Isolation of main feedwater (MFW) to limit secondary side mass losses,
- Start of AFW to ensure secondary side cooling capability,
- Isolation of the control room to ensure habitability, and
- 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.

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 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Each channel consists of one ~~push button~~ hand switch and the interconnecting wiring to the actuation logic cabinet. Each ~~push button~~ hand switch actuates both trains. This configuration does not allow testing at power. ②

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. The two trains are redundant such that only one is necessary to perform the ESFAS Function. ②

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~~ an abnormal condition or accident, but because of the large number of components actuated on a SI, actuation is simplified by the use of the manual actuation ~~push buttons~~ hand switches. Automatic actuation logic and actuation relays must be OPERABLE in MODE 4 to support system level manual initiation. ② ②

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 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~~ ②

This signal provides protection against the following accidents:

- SLB inside containment,
- LOCA, and
- Feed line break inside containment.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.~~ INSERT 2 ② ②

~~Thus, the high pressure Function will not experience any adverse environmental conditions and the [NTSP] reflects only steady state instrument uncertainties.~~

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. ②

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,
- A spectrum of rod cluster control assembly ejection accidents (rod ejection),
- Inadvertent opening of a pressurizer relief or safety valve,
- LOCAs, and
- 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 OPERABLE channels are required~~ ②

②

INSERT 2

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~to satisfy the requirements with a two-out-of-four logic. For units that have dedicated protection and control channels, only~~ three protection channels are necessary to satisfy the protective requirements. with a two-out-of-three logic. ② ②

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 ~~[~~NTSP~~]~~ reflects the inclusion of both steady state and adverse environmental instrument uncertainties. ④

This Function must be OPERABLE in MODES 1, 2, and 3 (above P-11) to mitigate the consequences of an HELB inside containment. This signal may be manually blocked by the operator below the P-11 setpoint. Automatic SI actuation below this pressure setpoint is then performed by the Containment Pressure - High ~~1~~ signal. ②

This Function is not required to be OPERABLE in MODE 3 below the P-11 setpoint. 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.

e. Safety Injection - Steam Line Pressure

(1) Steam Line Pressure – Low

Steam Line Pressure - Low 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 - 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

With the transmitters typically located inside the steam ~~tunnels~~ valve vaults, it is possible for them to experience adverse environmental conditions during a secondary side break. Therefore, the ~~[~~NTSP~~]~~ reflects both steady state and adverse environmental instrument uncertainties. ② ④

This Function is anticipatory in nature and has a ~~typical~~ lead/lag ratio of approximately 50/5. ②

Steam Line Pressure - Low must be OPERABLE in MODES 1, 2, and 3 (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. Below P-11, 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. 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. ②

~~(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.~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] 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.~~

~~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.~~

~~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~~

②

①

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~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.~~

~~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 a SLB event. Therefore, the [NTSP] reflects both steady state and adverse environmental instrument uncertainties. The Steam Line Pressure - Low signal was discussed previously under Function 1.e.(1).~~

②

~~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.~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2. Containment Spray

Containment Spray ~~provides three primary~~ functions to~~:~~ ②

~~1.~~ Lower~~s~~ containment pressure and temperature after an HELB in containment~~,~~

~~2~~. ~~Reduces the amount of radioactive iodine in the containment atmosphere, and~~

~~3. Adjusts the pH of the water in the containment recirculation sump after a large break LOCA~~.

~~These~~ This function~~s are~~ is necessary to~~:~~ ②

~~•~~ Ensure the pressure boundary integrity of the containment structure~~,~~

~~• Limit the release of radioactive iodine to the environment in the event of a failure of the containment structure, and~~

~~• 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~~. ② 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. Containment spray is actuated manually or automatically by ~~Containment Pressure - High 3 or~~ Containment Pressure - High-High. ②

a. Containment Spray - Manual Initiation

The operator can initiate containment spray at any time from the control room by simultaneously turning two ~~containment spray actuation~~ Phase B & Containment Ventilation Isolation switches in the same train. ② Because an inadvertent actuation of containment spray could have such serious consequences, two switches must be turned simultaneously to initiate containment spray. There are two sets of two switches each in the control room. Simultaneously turning the two

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

switches in either set will actuate containment spray in both trains in the same manner as the automatic actuation signal. Two Manual Initiation switches in each train are 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 isolation. but does not close the Main Steam Isolation Valves

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.

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 switches ~~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. ②

c. Containment Spray - Containment Pressure

This signal provides protection against a LOCA or a 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] reflects only steady state instrument uncertainties.~~ INSERT 3 ②

②

INSERT 3

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. ②

This function uses

~~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 Containment Pressure - High High Setpoint for other units. Some two loop units use three sets of two channels, each set combined in a one-out-of-two configuration, with these outputs combined so that two-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~~ arrangement~~s~~ exceed the minimum redundancy requirements. Additional redundancy is warranted because this Function is energized 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~~)~~ setpoint~~s~~. ② ④ ②

This

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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~~ ② ②

, essential raw cooling water, and control air

component cooling water

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Revision XXX

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Phase A signal enhances unit safety by allowing operators to use forced RCS circulation to cool the unit. Isolating ~~CCW~~ component cooling water on the ~~low pressure~~ Phase A signal may force the use of feed and bleed cooling, which could prove more difficult to control. ②

Phase A containment isolation is actuated automatically by SI, or manually via the automatic actuation logic. All process lines penetrating containment, with the exception of ~~CCW~~ component cooling water, essential raw cooling water, and control air, are isolated. ②

~~CCW~~ Component cooling water 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. ②

Manual Phase A Containment Isolation is accomplished by either of two switches in the control room. Either switch actuates both trains. Note that manual actuation of Phase A Containment Isolation also actuates Containment ~~Purge and~~ Ventilation ~~Exhaust~~ Isolation. ②

The Phase B signal isolates ~~CCW~~ component cooling water, essential raw cooling water, and control air. This occurs at a relatively high containment pressure that is indicative of a large break LOCA or a SLB. For these events, forced circulation using the RCPs is no longer desirable. Isolating the ~~CCW~~ component cooling water at the higher pressure does not pose a challenge to the containment boundary because the ~~CCW~~ Component Cooling Water 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~~ Component Cooling Water System design and Phase B isolation ensures the ~~CCW~~ Component Cooling Water System is not a potential path for radioactive release from containment. ② ② ②

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~~ ② ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~have been actuated~~. RCP operation will no longer be required and ~~CCW~~ component cooling water 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. ②

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.

a. Containment Isolation - Phase A Isolation

(1) Phase A Isolation - Manual Initiation

Manual Phase A Containment Isolation is actuated by either of two switches in the control room. Either switch actuates both trains. Note that manual initiation of Phase A Containment Isolation also actuates Containment ~~Purge~~ Ventilation Isolation. ②

(2) Phase A 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 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~~ an accident, 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~~ switches. 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. ② ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

(3) Phase A Isolation - Safety Injection

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.

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

INSERT 4 ②

(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 an accident ~~a DBA~~. ② 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 hand switches ~~push buttons~~. ② 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.

② **INSERT 4**

The operator can initiate Phase B containment isolation at any time from the control room by simultaneously turning two Phase B & Containment Ventilation Isolation switches in the same train. There are two sets of two switches each in the control room. Simultaneously turning the two switches in either set will actuate Phase B containment isolation in both trains in the same manner as the automatic actuation signal. Two Manual Initiation switches in each train are required to be OPERABLE to ensure no single failure disables the Manual Initiation Function. Note that Manual Initiation of Phase B containment isolation also actuates containment spray and containment vent isolation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

(3) Phase B Isolation - Containment Pressure

The basis for containment pressure MODE applicability is as discussed for ESFAS Function 2.c above.

4. Steam Line Isolation

Isolation of the main steam lines provides protection in the event of a 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 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 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. ②

a. Steam Line Isolation - Manual Initiation

four

each

s

Manual initiation of Steam Line Isolation can be accomplished from the control room. There are ~~two~~ switches in the control room and ~~either~~ switch ~~can~~ initiate action to immediately close ~~all~~ MSIV~~s~~. The LCO requires ~~two channels~~ to be OPERABLE. ②

one channel per steam line

its associated

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 SLB or other accident. 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, there is insufficient energy in the RCS and SGs to experience a SLB or other accident releasing significant quantities of energy. ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

c. Steam Line Isolation - Containment Pressure - High-High~~2~~ ②

This Function actuates closure of the MSIVs in the event of a LOCA or a 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-High~~2~~ 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~~ INSERT 5 ~~electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions, and the [NTSP] reflects only steady state instrument uncertainties~~. ② ②

Containment Pressure - High-High~~2~~ 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-High~~2~~ setpoint. ② ④ ②

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 a 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.

Steam Line Pressure - Low Function must be OPERABLE in MODES 1, 2, and 3 (~~above~~ when the Steam Line Isolation on Steam Line Pressure, Negative Rate-High is blocked ~~P-11~~), with any main steam valve open, when a secondary side break or stuck open

②

INSERT 5

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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 -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 ④

(2) Steam Line Pressure - Negative Rate – High

Steam Line Pressure - Negative Rate - High provides closure of the MSIVs for a 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, and the Steam Line Isolation on Steam Line Pressure, Low is blocked 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 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 a SLB or other accident that would result in a release of significant enough quantities of energy to cause a cooldown of the RCS. ② ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

While the transmitters may experience elevated ambient temperatures due to a SLB, the trip function is based on rate of change, not the absolute accuracy of the indicated steam pressure. Therefore, the ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ④

~~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)~~

~~These Functions (4.e and 4.f) provide closure of the MSIVs during a 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.~~ ②

~~g. Steam Line Isolation - High Steam Flow Coincident With Safety Injection and Coincident With T_{avg} - Low Low (Two Loop Units)~~

~~This Function provides closure of the MSIVs during a 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.~~

~~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.~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~With the transmitters (d/p cells) typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflect both steady state and adverse environmental instrument uncertainties.~~

~~The main steam line isolates only if the high steam flow signal occurs coincident with a 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 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.~~

~~With the T_{avg} resistance temperature detectors (RTDs) located inside the containment, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflects both steady state and adverse environmental instrumental uncertainties.~~

~~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~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~h. Steam Line Isolation - High High Steam Flow Coincident With Safety Injection (Two Loop Units)~~

~~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 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.~~

~~With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflects both steady state and adverse environmental instrument uncertainties.~~

~~The main steam lines isolate only if the high steam flow signal occurs coincident with a 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.~~

~~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.~~ ②

①

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5. Turbine Trip and Feedwater Isolation

The primary functions of the Turbine Trip and Feedwater Isolation signals are to prevent damage to the turbine due to water in the steam lines, and to stop the excessive flow of feedwater into the SGs. These Functions are 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 Function is actuated when the level in any SG exceeds the high high setpoint, and performs the following functions:

- Trips the main turbine,
- Trips the MFW pumps,
- Initiates feedwater isolation, and
- Shuts the MFW regulating valves and the bypass feedwater regulating valves.

The nominal trip setpoint and allowable value limits are a percentage of the narrow range instrument span for each steam generator.

This Function is actuated by SG Water Level - High High, or by a 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. ②

a. Turbine Trip and Feedwater 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.

b. Turbine Trip and Feedwater Isolation - Steam Generator Water Level - High High (P-14)

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

, with a two-out-of-three logic,

because

single failure in the other channels providing the protection function actuation.~~ Thus, four OPERABLE channels are required to satisfy the requirements with a two-out-of-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 NUREG-1218 (Ref. 8)~~. ②

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 ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ④

c. Turbine Trip and Feedwater Isolation - Safety Injection

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.

MFRV

Turbine Trip and Feedwater Isolation Functions must be OPERABLE in MODES 1 and 2 ~~[~~and 3~~]~~ except when all MFIVs, 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 not in service and this Function is not required to be OPERABLE. ④

6. Auxiliary Feedwater

pressure

AFW suction line

Raw Cooling Water (ERCW)

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) (~~normally~~ not safety related). A low ~~level~~ in the ~~CST~~ will automatically realign the pump suctions to the Essential ~~Service Water (ESW)~~ System (safety related). ~~The AFW System is aligned so that upon a pump start, flow is initiated to the respective SGs immediately.~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (Solid State Protection System)

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. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~

~~Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.~~ ②

b. ~~c.~~ Auxiliary Feedwater - Steam Generator Water Level - Low Low ②

SG Water Level - Low Low provides protection against a loss of heat sink due to a ~~. A~~ feed line break~~, inside or~~ outside of containment, or a loss of MFW, which results ~~would result~~ in a loss of SG water level. ② SG Water Level - Low Low provides input to the SG 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, four OPERABLE channels are required to satisfy the requirements with two-out-of-four logic. For units that have dedicated protection and control channels,~~ only three protection channels , with a two-out-of-three logic, are necessary to satisfy the protective requirements. because ~~For other units that have only three channels,~~ a median signal selector is provided~~or justification is provided in Reference 8~~. INSERT 6

~~With the transmitters (d/p cells) located inside containment and thus possibly experiencing adverse environmental conditions (feed line break), the [NTSP] reflects the inclusion of both steady state and adverse environmental instrument uncertainties.~~ INSERT 7 ②

c. ~~d.~~ Auxiliary Feedwater - Safety Injection ②

A 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.

② **INSERT 6**

With the transmitters located inside containment and thus possibly experiencing adverse environmental conditions (due to a feedline break), the Environmental Allowance Modifier (EAM) was devised. The EAM function (Containment Pressure (EAM) with a setpoint of < 0.5 psig) senses the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low-Low setpoint (Adverse) which reflects the increased transmitter uncertainties due to this environment. The EAM allows the use of a lower Steam Generator Water Level - Low-Low (EAM) setpoint when these conditions are not present, thus allowing more margin for normal operating conditions. Additionally, the NTSP reflects the inclusion of both steady state and adverse environmental instrument uncertainties.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. Two time delays are calculated, based on the number of steam generators indicating less than the Low-Low Level setpoint and the primary side power level. The magnitude of the delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low level trips.

In the event of failure of a Steam Generator Water Level channel, it is placed in the trip condition as input to the Solid State Protection System and does not affect either the EAM or TTD setpoint calculations for the remaining OPERABLE channels. Failure of the Containment Pressure (EAM) channel to a protection set also does not affect the EAM setpoint calculations. This results in the requirement that the operator adjust the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints or actuate the SG Water Level Low-Low setpoint. Failure of the RCS loop ΔT channel input (failure of more than one T_H resistance temperature detectors (RTD) or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the man-machine-interface (MMI) test cart.

There are three Steam Generator Water Level Low-Low channels per steam generator arranged in a two-out-of-three logic. These channels are arranged in four protection sets with each channel of the Containment Pressure (EAM) and RCS Loop ΔT inputting into its associated protection set.

②

INSERT 7

With the transmitters (d/p cells) located inside containment and the accidents the channel provides protection for occurring outside containment, the NTSP reflects only steady state instrument uncertainties. Because the transmitters (d/p cells) are located inside containment, thus possibly experiencing adverse environmental conditions during a feed line break inside containment, the SG Water Level-Low Low Trip Setpoint may not have sufficient margin to account for adverse environmental instrument uncertainties; in this case, AFW pump start will be provided by a Containment Pressure-High SI signal.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

d. ~~e.~~ Auxiliary Feedwater - Loss of Offsite Power ②

6.9 kV Unit-boards (RCP buses)

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 AFW loss of offsite power is detected by a voltage drop on each 6.9 kV shutdown board ~~service bus~~. Loss of power to either ~~service bus~~ will start the turbine driven AFW pump~~s~~ 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. ② ②

INSERT 8 ②

Functions 6.a through 6.d ~~e~~ must be OPERABLE in MODES 1, 2, and 3 to ensure that the SGs remain the heat sink for the reactor. SG Water Level - Low Low in any operating 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 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. ⑤ ② ②

~~f. Auxiliary Feedwater - Undervoltage Reactor Coolant Pump~~

~~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 downstream of each RCP breaker. A loss of power, or an open RCP breaker, on two or more RCPs, 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.~~ ②

e. ~~g.~~ Auxiliary Feedwater - Trip of All Main Feedwater Pumps ②

A Trip of all 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 one ~~two~~ pressure switch~~es~~ on the control ~~air/~~oil line for the speed control system. A low pressure signal from this ~~either of these~~ pressure switch~~es~~ indicates a trip of that pump. ~~Motor~~ ②

②

INSERT 8

The loss-of-voltage relaying on the 6.9 kV shutdown board uses three solid-state voltage sensors in a two-out-of-three voltage sensor logic (27T-S1A, S1B, & S1C) for loss-of-power detection. A two-out-three logic from the voltage sensor channels energizes two parallel separate timing relays with a one-out-of-two logic scheme (LV1 and LV2). These voltage sensors and timing relays provide emergency diesel generator start, load-shed initiation, and subsequent turbine driven auxiliary feedwater (TDAFW) pump start through separate blackout relays (BOX and BOY).

A footnote has been added to clarify that this requirement only applies to shutdown board instrumentation on the same unit. This clarification removes the potential to declare the AFW loss-of-power start instrumentation inoperable for a given unit when only the opposite unit's instrumentation is inoperable.

The AFW turbine-driven pump is considered OPERABLE when one train of the AFW loss of power start function is declared inoperable, in accordance with technical specifications, because both 6.9 kilovolt shutdown board logic trains supply this function.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~driven MFW pumps are equipped with a breaker position sensing channel. An open supply breaker indicates that the pump is not running. Two OPERABLE channels per pump satisfy redundancy requirements with one-out-of-two taken twice logic.~~ ② A trip of all MFW pumps starts the 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.

INSERT 9 ⑤

Function~~s~~ 6.e~~f and 6.g~~ must be OPERABLE in MODES 1 and 2. ⑤ 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 ② pumps may be normally shut down, and thus neither pump trip is indicative of a condition requiring automatic AFW initiation.

f. ~~h.~~ <u>Auxiliary Feedwater - Pump Suction Transfer on Suction Pressure – Low</u> ②

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. Three ~~Two~~ pressure switches are located on the AFW pump suction line from the CST. A low pressure signal sensed by two of three ~~any one of the~~ switches will cause the emergency supply of water for the ~~both~~ pump~~s~~ to be aligned~~, or cause the AFW pumps~~ to ~~stop until~~ the emergency source of water ~~is aligned~~. ERC~~S~~W (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. ②

Since the detectors are located in an area not affected by HELBs or high radiation, they will not experience any adverse environmental conditions however ~~and~~ the ~~[~~NTSP~~]~~ reflects both ~~only~~ steady state and adverse environmental instrument uncertainties. ② ④

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 10 ②

⑤

INSERT 9

This Function includes two footnotes. The first footnote indicates that MODE 2 applicability is limited to operation when one or more MFW pumps are supplying feedwater to the steam generators (SGs), and the second footnote provides for delaying the entry into the action statement when starting or stopping MFW pumps in MODE 1.

The first footnote limits the Applicability to require the auto-start logic to be operable in MODE 2 only when at least one MFW pump is in service supplying feedwater to the SGs. Because plant conditions at the time of entry into Mode 2 do not allow the MFW pumps to operate, without this footnote the channels would need to be tripped resulting in an AFW start signal, starting the turbine-driven pump in addition to the motor-driven AFW pumps, which is an undesirable situation. This resolves a conflict between the MODE applicability and plant design, which does not support MFW pump operation at the time of entry into MODE 2. Also, modifying the requirement for auto-start of the AFW pumps to be only required when the MFW pumps are in service limits the potential for inadvertent AFW actuations during normal plant startups and shutdowns that could lead to reactivity control issues due to over cooling transients.

The second footnote delays entry into the Required Action for less than minimum channels operable for up to 4 hours. During the time of starting and stopping a second MFW pump, when the pump is in reset, the auto-start function is inoperable. Starting and stopping MFW pumps during plant startup and shutdown is a normal evolution, which will normally be accomplished within a short time. This note is intended to prevent unnecessary entries into the Required Actions, which provides a timeframe to correct unplanned equipment failures. For the normal operating evolution of starting and stopping pumps, the footnote allows a delay of up to 4 hours before entering the Required Action. The evolution should be completed in less time, but the 4 hours provides a reasonable allowance for operating contingencies. If the evolution takes longer than 4 hours, it is probably indicative of an equipment problem and entering the Required Action is appropriate.

②

INSERT 10

g. Auxiliary Feedwater Suction Transfer Time Delays

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. The pressure switch setpoints and the logic time delays for the AFW pump suction switchover were determined to ensure that adequate net positive suction head (NPSH) for the AFW pumps is maintained during the pump suction transfer sequence.

The available NPSH for the pumps is calculated assuming a water level in the supply header that would not be reached until after the time delays are exceeded, even when accounting for the two TDAFW timers in series. The TDAFW pump has two timers because this pump can be switched to either of the two trains in the ERCW system: one timer is for the transfer to one of the two trains. The timers operate in sequence to assure that the TDAFW pump is transferred to one of the ERCW trains.

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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

a. Automatic Switchover to Containment Sump - 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.

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 ②

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 a 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. ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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~~ containment sump tall strainer submergence. ~~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.~~ ② ②

The RWST level 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 ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ② ④

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. ②

~~-------------------------------------REVIEWER'S NOTE-----------------------------~~ ③

~~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~~ that automatic switchover is permitted before RWST level decreases below the RWST Level – Low setpoint. This ensures an adequate suction supply to the ECCS pumps by allowing sufficient time for completion of the switchover before vortexing occurs in the RWST. ~~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 ~~[~~NTSP~~]~~ reflects the inclusion of both steady state and environmental instrument uncertainties. ② ② ② ② ④

~~Units only have one of the Functions, 7.b or 7.c.~~ ③

~~--~~

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

8. Engineered Safety Feature Actuation System Interlocks

To allow some flexibility in unit operations, several interlocks are included as part of the ESFAS. These interlocks permit 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.

a. Engineered Safety Feature Actuation System Interlocks - Reactor Trip, P-4

The P-4 interlock is enabled when a reactor trip breaker ~~(RTB)~~ ② and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation may be ~~is~~ ② blocked after a 60 ~~[ ]~~ ④ 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 reactor trip breakers ~~RTBs~~ have been manually closed. ② The functions of the P-4 interlock are:

- Trip the main turbine,
- Isolate MFW with coincident low T_{avg},
- Prevent automatic reactuation of SI after a manual reset of SI, and ② ⑥
- ~~Transfer the steam dump from the load rejection controller to the unit trip controller, and~~ ②
- Prevent opening of the MFW isolation valves if they were closed on SI or SG Water Level - High High.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. There are two P-4 channels arranged in a one-out-of-one logic per channel. ②

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~~ three Functions associated with the reactor trip signal, is required to show that the unit licensing basis safety analysis acceptance criteria are not exceeded. ②

The ~~RTB~~ reactor trip breaker position switches ~~that~~ provide input to the P-4 interlock ~~only function~~ to ~~energize or de-energize or~~ indicate open or close ~~contacts~~. Therefore, this Function has no adjustable trip setpoint with which to associate a ~~[~~NTSP~~]~~ and Allowable Value. ② ④

This Function must be OPERABLE in MODES 1, 2, and 3 when the reactor may be critical or approaching criticality. 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. ②

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 a 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~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~these trips by use of the respective manual reset buttons. When the Steam Line Pressure - Low steam line isolation signal is enabled~~, and the main steam isolation on Steam Line Pressure - Negative Rate - High is disabled. The ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ② ④

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.

~~c. Engineered Safety Feature Actuation System Interlocks - T_{avg} - Low Low, P-12~~ ②

~~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.~~

~~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).

BASES

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.~~
~~---~~ ③

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.

setpoint comparator output, contact output,

on a "per" basis

In the event a channel's ~~[~~NTSP~~]~~ 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. ④ ② 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 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.~~
~~---~~ ③

<u>A.1</u>

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.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

Condition B applies to manual initiation of:

- SI,
- Containment Spray,
- Phase A Isolation, and
- Phase B Isolation.

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, 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. ②

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,
- Containment Spray,
- Phase A Isolation, and
- Phase B Isolation~~, and~~
- ~~Automatic Switchover to Containment Sump~~.

BASES

ACTIONS (continued)

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 9. 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 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. 10) that 4 hours is the average time required to perform train surveillance. ④

D.1, D.2.1, and D.2.2

Condition D applies to:

- Containment Pressure - High ~~1~~, ②
- Pressurizer Pressure - Low ~~(two, three, and four loop units)~~, ②
- Steam Line Pressure - Low,
- ~~Steam Line Differential Pressure - High,~~
- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low or Coincident With Steam Line Pressure - Low~~, ②
- ~~Containment Pressure - High 2~~,
- Steam Line Pressure - Negative Rate - High,
- ~~High Steam Flow Coincident With Safety Injection Coincident With T_{avg} - Low Low~~, ②

BASES

ACTIONS (continued)

- ~~High High Steam Flow Coincident With Safety Injection,~~
- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low,~~
- ~~SG Water level - Low Low (two, three, and four loop units)~~, and ②
- ~~[~~SG Water level - High High (P-14) ~~(two, three, and four loop units)~~. ~~]~~ ④

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 9. ②

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 and MODE 4 within the next 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. 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 9. ~~]~~ ④ ④

~~-----------------------------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.~~
~~--~~ ③

BASES

ACTIONS (continued)

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

Condition E applies to:

- Containment Spray Containment Pressure - ~~High 3 (~~High~~,~~-High~~) (two, three, and four loop units)~~, ~~and~~ ②
- Containment Phase B Isolation Containment Pressure - ~~High 3 (~~High~~,~~-High~~).~~, and
- Steam Line Isolation Containment Pressure – High-High

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 bypassed, a single instrumentation channel failure will not spuriously initiate containment spray.

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 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 bypassed condition within 72 ~~6~~ hours, requires the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 ~~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. ②

[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 9.] ④ ④

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.~~
~~--~~ ③

INSERT 11

G

~~F~~.1, ~~F~~.2.1, and ~~F~~.2.2 ②

Condition ~~F~~ G applies to~~:~~ the

- ~~Manual Initiation of Steam Line Isolation,~~ ②
- ~~Loss of Offsite Power,~~ ②
- ~~Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low, and~~ ②
- P-4 Interlock.

For the ~~Manual Initiation and the~~ P-4 Interlock Function~~s~~, this action addresses the train orientation of the SSPS. ~~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~~. ② 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 the~~se~~ Function~~s~~, ② 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 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 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.

② **INSERT 11**

F.1 and F.2

Condition F applies to the Steam Line Isolation, Manual Initiation ESFAS Function.

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 this Function, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the associate MSIV is declared inoperable and the associated Required Actions followed for an inoperable MSIV.

BASES

ACTIONS (continued)

H

~~G~~.1, ~~G~~.2.1, and ~~G~~.2.2 ②

Condition ~~G~~ H applies to the automatic actuation logic and actuation relays for the Steam Line Isolation ~~[~~Turbine Trip and Feedwater Isolation,~~]~~ and AFW actuation Functions. ④

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 9. 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 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 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.

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. 10) assumption that 4 hours is the average time required to perform channel surveillance. ④

~~[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 9. 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~~ ②

①

BASES

ACTIONS (continued)

~~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.~~

~~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. 10) assumption that 4 hours is the average time required to perform channel surveillance.]~~

~~I.1 and I.2~~

~~Condition I applies to:~~

- ~~[SG Water Level - High High (P-14) (two, three, and four loop units), and]~~
- ~~Undervoltage Reactor Coolant Pump.~~

~~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 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. 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.~~

~~[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 9.]~~

②

② ①

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 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 9.~~
~~---~~ ③

INSERT 12
INSERT 13
INSERT 14
INSERT 15 ⑤ ②

N

~~J~~.1 and ~~J~~.2

N

Condition ~~J~~ applies to the AFW pump start on trip of all MFW pumps. ②

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 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. The allowed Completion Time ~~of 6 hours~~ is ② 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 10.

INSERT 16 ②

P

~~K~~.1, ~~K~~.2.1, and ~~K~~.2.2 ②

P

Condition ~~K~~ applies to~~:~~ the ②

- ~~RWST Level - Low Low Coincident with Safety Injection, and~~

- ~~•~~ RWST Level - Low ~~Low~~ Coincident with Safety Injection and Coincident with Containment Sump Level - High. ②

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~~ comparators to energize to perform their required action. The failure of up to two channels will not prevent the operation of this Function. However, placing ② ②

②

INSERT 12

I.1 and I.2

Condition I applies to the following ESFAS Functions:

- Steam Generator Water Level--Low-Low (Adverse), and
- Steam Generator Water Level--Low-Low (EAM)

A known inoperable channel must be placed in the tripped condition within 6 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.

In addition to placing the channel in the tripped condition, it is necessary to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set within 4 hours.

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.

②

INSERT 13

J.1, J.2, J.3.1, and J.3.2

Condition J applies to the Containment Pressure (EAM) coincidence with Steam Generator Water Level--Low-Low (Adverse) ESFAS Function.

Failure of the Containment Pressure (EAM) channel to a protection set does not affect the EAM setpoint calculations. A known inoperable Containment Pressure channel results in the requirement to adjust the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints for the affected protection set to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoint within 6 hours. ②

An alternative to adjusting the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints is to place the associated protection set's SG Water Level Low-Low channels in the tripped condition within 6 hours.

If neither of the above Required Actions are completed within their associated Completion Time, then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours and MODE 4 within 18 hours. The allowed Completion Times are reasonable 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. ⑤

INSERT 14

K.1, K.2, K.3.1, and K.3.2

Condition K applies to the RCS Loop ΔT coincidence with SG Water Level – Low-Low.

Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP within 6 hours. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG level is removed. ②

An alternative to adjusting the threshold power level for zero seconds time delay is to place the affected protection set's SG Water Level Low-Low level channels in the tripped condition within 6 hours.

If neither of the above Required Actions can be completed within their associated Completion Times then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours and MODE 4 within 18 hours. The allowed Completion Times are reasonable 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. ⑤

② **INSERT 15**

L.1 and L.2

Condition L applies to the Loss of Voltage sensors associated with the Loss of Power AFW pump start ESFAS Function. These are the same sensors for the DG loss of Voltage start.

This function is provided by voltage sensors for each train arranged in a two-out-of-three logic scheme. If a sensor is inoperable, 6 hours is allowed to return it to OPERABLE status.

If the inoperable sensor cannot be restored to OPERABLE status within the specified Completion Time, the associated AFW pump must be declared inoperable. The TDAFW pump is considered OPERABLE when at least one train of the AFW loss of power start function is OPERABLE because both 6.9 kV shutdown board logic trains supply this function.

M.1.1, M.1.2, and M.2

Condition M applies to the Loss of Voltage sensors and load shed timers associated with the Loss of Power AFW pump start ESFAS Function. These are the same sensors and timers for the DG loss of Voltage start.

This function is provided by voltage sensors for each train arranged in a two-out-of-three logic scheme with associated load shed timers arranged in a one-out-of-two logic. If two or more voltage sensors or one required load shed timer are inoperable, 1 hour is allowed to return the inoperable channel(s) to OPERABLE status.

If the inoperable sensors cannot be made OPERABLE such that only one sensor is inoperable or one required load shed timer cannot be made OPERABLE within the specified Completion Time, the associated auxiliary feedwater pump must be declared inoperable. The AFW turbine-driven pump is considered OPERABLE when at least one train of the AFW loss of power start function is OPERABLE because both 6.9 kV shutdown board logic trains supply this function.

INSERT 16

The Required Actions are modified by a note delaying the entry into the Required Action statement when starting or stopping MFW pumps. Starting and stopping MFW pumps during plant startup and shutdown is a normal evolution, which will normally be accomplished within a short time. It was not intended to result in unnecessary entries into the Required Actions, which provides a timeframe to correct unplanned equipment failures. The 4 hours is consistent with similar allowances in other SQN TSs. ⑦

O.1

Condition O applies to the following ESFAS Functions:

- Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low,
- Auxiliary Feedwater Suction Transfer Time Delays, Motor-Driven Pump, and
- Auxiliary Feedwater Suction Transfer Time Delays, Turbine-Driven Pump.

These functions are provided by three pressure sensors located on the suction of each AFW pump arranged in a two-out-of-three logic scheme. The motor driven AFW pumps have one time delay, while the TDAFW pump has two. The motor driven and the first TDAFW pump time delays prevent spurious transfer. The TDAFW Pump second time delay ensures ERCW Train A valves stroke open sufficiently. ②

If a pressure sensor channel or a time delay channel is inoperable, the associated AFW pump must be declared inoperable immediately.

BASES

ACTIONS (continued)

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 ④ ensure 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 ~~[~~6~~]~~ hour Completion Time is ④ justified in Reference 11. If the channel cannot be returned to OPERABLE status or placed in the bypass condition within 6 hours, the ② unit must be brought to MODE 3 within the following ~~[~~6~~]~~ hours and ④ 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.

~~[~~ 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 11.~~]~~ ④ ④

~~-----------------------------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 11.~~
~~---~~ ③

~~L~~Q.1, ~~L~~Q.2.1, and ~~L~~Q.2.2

Condition ~~L~~Q applies to the P-11 ~~and P-12 [and P-14]~~ interlock~~s~~. ② ④

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

BASES

ACTIONS (continued)

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.

INSERT 17 ⑤

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.~~
~~--~~ ③

~~-------------------------REVIEWER'S NOTE------------------------------------~~
~~Notes b and c are applied to the setpoint verification Surveillances for all Engineered Safety Feature Actuation System (ESFAS) Instrumentation Function in Table 3.3.2-1 unless one or more of the following exclusions apply:~~

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

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

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

~~--~~ ③

⑤

INSERT 17

R.1 and R.2

If the inoperable channel cannot be placed in the tripped condition or the TTD of the single steam generator time delay calculation (T_S) adjusted to match the multiple steam generator time delay calculation (T_M) for the affected protection set within the specified Completion Time, the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit placed in MODE 3 within 6 hours and MODE 4 within 12 hours. The allowed Completion Times are reasonable 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.

S.1 and S.2

Condition S applies to the automatic actuation logic and actuation relays for the Automatic Switchover to Containment Sump.

This action addresses the train orientation of the SSPS and the master and slave relays. If one train is inoperable 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 12 hours and in MODE 5 within an additional 30 hours (42 hours total time). The Completion Times are reasonable 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.

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~
~~--~~

③

SR 3.3.2.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 hours is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during~~

⑧

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~normal operational use of the displays associated with the LCO required channels.~~ ⑧

~~OR~~

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

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

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST 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. 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 12.~~ ⑧

~~OR~~

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

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

~~SR 3.3.2.3~~ ②

~~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~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~ ②

~~OR~~

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

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

SR 3.3.2.4 3 ②

SR 3.3.2.4 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. The time allowed for the testing on a STAGGERED TEST BASIS (4 hours) is justified in Reference 12. ~~[The Frequency of 92 days is justified in Reference 10.~~ ⑧

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~5~~ 4 ②

SR 3.3.2.~~5~~ 4 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found conservative with respect to the Allowable Values specified in Table 3.3.2-1. 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.

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.

The "as-found" and "as-left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

~~[The Frequency of 184 days is justified in Reference 12.~~ ⑧

~~OR~~

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

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

SR 3.3.2.~~5~~ 4 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~---~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

SR 3.3.2.~~6~~ 5 ②

SR 3.3.2.~~6~~ 5 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. ~~[The Frequency of 92 days is adequate, based on industry operating experience, considering instrument reliability and operating history data.~~

~~OR~~ ⑧

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.2.~~7~~6 ②

SR 3.3.2.~~7~~6 is the performance of a TADOT. This test is a check of the Loss of Offsite Power~~, Undervoltage RCP, and AFW Pump Suction Transfer on Suction Pressure - Low~~ Function~~s~~. ~~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.

The test also includes trip channels 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 of 92 days is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.~~ ⑧

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~8~~ 7 ②

SR 3.3.2.~~8~~ 7 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. 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 of 18 months is adequate, based on industry operating experience and is consistent with the typical refueling cycle.~~ ⑧

~~OR~~

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

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

~~SR 3.3.2.8 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the [NTSP]. Where a setpoint more conservative than the [NTSP] is used in the plant surveillance~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the [NTSP], then the channel shall be declared inoperable.~~ ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~---~~ ③

~~The second Note also requires that the [NTSP and the] methodologies for calculating the as-left and the as-found tolerances be in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~ ②

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.

SR 3.3.2.~~9~~8 ②

SR 3.3.2.~~9~~8 is the performance of a CHANNEL CALIBRATION.

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.

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.

~~[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.~~

~~OR~~ ⑧

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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.

SR 3.3.2.~~9~~ 8 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ② ④ ④ ④

~~----------------------------------REVIEWER'S NOTE----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~---~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~10~~ 9 ②

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~~ Updated Final Safety Analysis Report, Section 7.3 ~~Manual, Section 15~~ (Ref. 13). 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). ②

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 U 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. ②

~~-----------------------------REVIEWER'S NOTE---~~
~~Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A (Ref. 14). and/or WCAP-14036-P (Ref. 15).~~
~~---~~ ③

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. 14) 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. 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.

~~[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.~~ ⑧

~~OR~~

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

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

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching ~~[1000]~~ 842 psig in the SGs. ④

SR 3.3.2.~~11~~ 10

SR 3.3.2.~~11~~ 10 is the performance of a TADOT as described in SR 3.3.2.~~8~~ 7, except that it is performed for the P-4 Reactor Trip Interlock, and the ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

reactor trip breaker

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. ②

reactor trip breaker

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. Regulatory Guide 1.105, "Setpoint for Safety Related Instrumentation," Revision 3.

U

2. FSAR, Chapter ~~[~~6~~]~~. ② ④

U

3. FSAR, Chapter ~~[~~7~~]~~. ② ④

U

4. FSAR, Chapter ~~[~~15~~]~~. ② ④

5. IEEE-279-1971.

6. 10 CFR 50.49.

Calculation SQN-EEB-PL&S, Precautions, Limitations, and Setpoints for NSSS

7. ~~Plant-specific setpoint methodology study~~. ②

8. NUREG-1218, April 1988.

9. WCAP-14333-P-A, Rev. 1, October 1998.

10. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

License Amendment dated June 13, 1995, Issuance of Amendments to Technical Specifications – Sequoyah Nuclear Plant, Units 1 and 2 (TAC NOS. M91990 and 91991) (ML013320052)

11. ~~[Plant specific evaluation reference.]~~ ④

12. WCAP-15376, Rev. 0. October 2000.

UFSAR, Section 7.3

13. ~~Technical Requirements Manual, Section 15, "Response Times."~~ ②

14. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

15. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995.

B 3.3 INSTRUMENTATION

B 3.3.2~~A~~ Engineered Safety Feature Actuation System (ESFAS) Instrumentation ~~(Without Setpoint Control Program)~~

①

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. 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 INSERT 1 "Where a LSSS is specified for a variable on which a safety limit has been placed, the setting must be chosen so that automatic protective actions will correct the abnormal situation before a Safety Limit (SL) is exceeded." The Analytical Limit is the limit of the process variable at which a 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.

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 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.~~

③

② INSERT 1

settings for automatic protective devices related to those variables having significant safety functions. The regulation also states,

BASES

BACKGROUND (continued)

~~Licensees are to insert the name of the document(s) controlled under 10 CFR 50.59 that contain the methodology for calculating the as-left and as-found tolerances, in Note c of Table 3.3.2-1 for the phrase "[insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]" throughout these Bases.~~ ③

~~Where the [NTSP] is not included in Table 3.3.2-1, the plant-specific location for the [NTSP] must be cited in Note c of Table 3.3.2-1. The brackets indicate plant-specific terms may apply, as reviewed and approved by the NRC.~~

~~---~~

The ~~[~~Nominal Trip Setpoint (NTSP)~~]~~ specified in Table 3.3.2-1 is a predetermined setting for a protection channel chosen to ensure automatic actuation prior to the process variable reaching the Analytical Limit and thus ensuring that the SL would not be exceeded. As such, the ~~[~~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). ④ ④ ④

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. ④ ④ ④

BASES

BACKGROUND (continued)

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 within the established as-left tolerance around the ~~[~~NTSP~~]~~ to account for further drift during the next surveillance interval. ④

~~[Note: Alternatively, a Technical Specification format incorporating an Allowable Value only column may be proposed by a licensee. In this case, the [NTSP] value and the methodologies used to calculate the as-found and as-left tolerances must be specified in [insert the name of a document controlled under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]. Changes to the actual plant trip setpoint or [NTSP] value would be controlled by 10 CFR 50.59 or administratively as appropriate, and adjusted per the setpoint methodology and applicable surveillance requirements.~~ ③

During Anticipated Operational Occurrences (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 SL value to prevent departure from nucleate boiling (DNB),
2. Fuel centerline melt shall not occur, and
3. The RCS pressure SL of ~~[~~2735~~]~~ psig shall not be exceeded. ④

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 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 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.

The ESFAS instrumentation is segmented into three distinct but interconnected modules as identified below:

- Field transmitters or process sensors and instrumentation: provide a measurable electronic signal based on the physical characteristics of the parameter being measured,

BASES

BACKGROUND (continued)

Process

- 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, and control board/control room/miscellaneous indications, and ②

, setpoint comparator, or contact

- 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. ②

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. In many cases, field transmitters or sensors that input to the ESFAS are shared with the Reactor Trip System (RTS). 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 ~~[~~NTSP~~]~~ and Allowable Value. 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. ④

Signal Processing Equipment

analog to digital conversion (Digital Protection System),

U

, setpoint comparator, or contact

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 ~~[~~NTSPs~~]~~ derived from Analytical Limits established by the safety analyses. ④ Analytical Limits are defined in FSAR, Chapter ~~[~~6~~]~~ (Ref. 2), Chapter ~~[~~7~~]~~ (Ref. 3), and Chapter ~~[~~15~~]~~ (Ref. 4). ② 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. ② 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. ②

BASES

BACKGROUND (continued)

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.

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 3.

~~[~~NTSPs~~]~~ and ESFAS Setpoints ~~[~~Allowable Values~~]~~ ④

The trip setpoints used in the bistables , setpoint comparators, or contacts are based on the analytical limits stated in Reference 3. The calculation of the ~~[~~NTSPs~~]~~ specified in Table 3.3.2-1 is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 6), the Allowable Values specified in Table 3.3.2-1 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 ESFAS ~~[~~NTSPs~~]~~ including their explicit uncertainties, is provided in the plant specific setpoint methodology study (Ref. 7) which incorporates all of the known uncertainties applicable to each channel. The as-left tolerance and as-found tolerance band methodology is provided in ~~[insert the name of a document controlled~~ UFSAR Section 7.1.2 ~~under 10 CFR 50.59 such as the Technical Requirements Manual or any document incorporated into the facility FSAR]~~. The magnitudes of these uncertainties are factored into the determination of each ESFAS ~~[~~NTSP~~]~~ and corresponding Allowable Value. The nominal ESFAS setpoint entered ~~into the bistable~~ is more conservative than that specified by the ~~[NTSP]~~ Allowable Value to account for measurement errors detectable by the CHANNEL OPERATIONAL TEST (COT). The Allowable Value serves as the as-found Technical Specification OPERABILITY limit for the purpose of the COT. ② ④ ④ ④ ④ ② ④

BASES

BACKGROUND (continued)

or setpoint comparators

The ~~[~~NTSP~~]~~ is the value at which the bistables are set and is the expected value to be achieved during calibration. The ~~[~~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" ~~[~~NTSP~~]~~ value is within the as-left tolerance for CHANNEL CALIBRATION uncertainty allowance (i.e., + rack calibration and comparator setting uncertainties). The ~~[~~NTSP~~]~~ value is therefore considered a "nominal value" (i.e., expressed as a value without inequalities) for the purposes of the COT and CHANNEL CALIBRATION. ④ ② ④ ② ④ ④

or setpoint comparator

~~[~~Nominal Trip Setpoints~~]~~, in conjunction with the use of as-found and as-left tolerances together 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. ④

Note that the Allowable Values listed in Table 3.3.2-1 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 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 SR section.

<u>Solid State Protection System</u>

, setpoint comparators, or contacts

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. ②

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.

①

BASES

BACKGROUND (continued)

, setpoint comparator, or contact

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. ②

Each SSPS train has a built in testing device that can automatically test the decision logic matrix functions and the actuation channels 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.

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.

~~-----------------------------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.~~
~~---~~ ③

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

actuation signal for small loss of coolant accidents (LOCAs) 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 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. 4).

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.

The LCO requires all instrumentation performing an ESFAS Function, listed in Table 3.3.2-1 in the accompanying LCO, to be OPERABLE. The Allowable Value specified in Table 3.3.2-1 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 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). ④ 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 evaluated during performance of the SR. This evaluation will consist of resetting the channel setpoint to the ~~[~~NTSP~~]~~ (within the ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

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 this 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. ④ ④

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.

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. <u>Safety Injection</u>

   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).

   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:

   - Phase A Isolation,
   - Containment ~~Purge~~ Ventilation Isolation, ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- Reactor Trip,
- ERCW and CCS Pump Start and System Isolation ②
- Turbine Trip,
- Feedwater Isolation,
- Start of motor driven auxiliary feedwater (AFW) pumps,
- Control room ventilation isolation, and
- Enabling automatic switchover of Emergency Core Cooling Systems (ECCS) suction to containment sump.

These other functions ensure:

- Isolation of nonessential systems through containment penetrations,
- Trip of the turbine and reactor to limit power generation,
- Isolation of main feedwater (MFW) to limit secondary side mass losses,
- Start of AFW to ensure secondary side cooling capability,
- Isolation of the control room to ensure habitability, and
- 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.

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 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Each channel consists of one ~~push button~~ hand switch and the interconnecting wiring to the actuation logic cabinet. Each ~~push button~~ hand switch actuates both trains. This configuration does not allow testing at power. ②

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. The two trains are redundant such that only one is necessary to perform the ESFAS Function. ②

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~~ an abnormal condition or accident, but because of the large ② number of components actuated on a SI, actuation is simplified by the use of the manual actuation ~~push buttons~~ hand switches. Automatic ② 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 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~~ ②

This signal provides protection against the following accidents:

- SLB inside containment,
- LOCA, and
- Feed line break inside containment.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.~~ INSERT 2 ②

~~Thus, the high pressure Function will not experience any adverse environmental conditions and the [NTSP] reflects only steady state instrument uncertainties.~~

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. ②

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,
- A spectrum of rod cluster control assembly ejection accidents (rod ejection),
- Inadvertent opening of a pressurizer relief or safety valve,
- LOCAs, and
- 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 OPERABLE channels are required~~ ②

②

INSERT 2

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~to satisfy the requirements with a two-out-of-four logic. For units that have dedicated protection and control channels, only~~ three protection channels are necessary to satisfy the protective requirements. with a two-out-of-three logic. ② ②

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 ~~[~~NTSP~~]~~ reflects the inclusion of both steady state and adverse environmental instrument uncertainties. ④

This Function must be OPERABLE in MODES 1, 2, and 3 (above P-11) to mitigate the consequences of an HELB inside containment. This signal may be manually blocked by the operator below the P-11 setpoint. Automatic SI actuation below this pressure setpoint is then performed by the Containment Pressure - High ~~1~~ signal. ②

This Function is not required to be OPERABLE in MODE 3 below the P-11 setpoint. 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.

e. Safety Injection - Steam Line Pressure

(1) Steam Line Pressure – Low

Steam Line Pressure - Low 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 - 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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

With the transmitters typically located inside the steam ~~tunnels~~ valve vaults, it is possible for them to experience adverse environmental conditions during a secondary side break. Therefore, the ~~[~~NTSP~~]~~ reflects both steady state and adverse environmental instrument uncertainties. ② ④

This Function is anticipatory in nature and has a ~~typical~~ lead/lag ratio of approximately 50/5. ②

Steam Line Pressure - Low must be OPERABLE in MODES 1, 2, and 3 (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. Below P-11, 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. 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. ②

~~(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.~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] 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.~~

~~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.~~

~~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~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~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.~~

~~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 a SLB event. Therefore, the [NTSP] 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.~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2. Containment Spray

Containment Spray ~~provides three primary~~ functions to~~:~~ ②

~~1.~~ Lower~~s~~ containment pressure and temperature after an HELB in containment~~,~~

~~2~~. ~~Reduces the amount of radioactive iodine in the containment atmosphere, and~~

~~3. Adjusts the pH of the water in the containment recirculation sump after a large break LOCA~~.

~~These~~ This function~~s are~~ is necessary to~~:~~ ②

~~•~~ Ensure the pressure boundary integrity of the containment structure~~,~~

~~• Limit the release of radioactive iodine to the environment in the event of a failure of the containment structure, and~~

~~• 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~~. ② 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. Containment spray is actuated manually or automatically by ~~Containment Pressure - High 3 or~~ Containment Pressure - High - High. ②

a. Containment Spray - Manual Initiation

The operator can initiate containment spray at any time from the control room by simultaneously turning two ~~containment spray actuation~~ Phase B & Containment Ventilation Isolation switches in the same train. ② Because an inadvertent actuation of containment spray could have such serious consequences, two switches must be turned simultaneously to initiate containment spray. There are two sets of two switches each in the control room. Simultaneously turning the two

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

switches in either set will actuate containment spray in both trains in the same manner as the automatic actuation signal. Two Manual Initiation switches in each train are 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 isolation. but does not close the Main Steam Isolation Valves

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.

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 switches ~~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. ②

c. Containment Spray - Containment Pressure

This signal provides protection against a LOCA or a 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] reflects only steady state instrument uncertainties.~~ INSERT 3 ②

②

INSERT 3

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. ②

This function uses

~~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 Containment Pressure - High High Setpoint for other units. Some two loop units use three sets of two channels, each set combined in a one-out-of-two configuration, with these outputs combined so that two-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~~ ②

This

arrangement~~s~~ exceed the

s

minimum redundancy requirements. Additional redundancy is warranted because this Function is energized to trip. Containment Pressure - ~~[High 3] [~~High High~~]~~ must be ④

\-

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~~)~~ setpoint~~s~~. ②

\-

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

, essential raw cooling water, and control air

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 ②

component cooling water

required) method of decay heat removal. Since ~~CCW~~ is required to support RCP operation, not isolating ~~CCW~~ on the ~~low pressure~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Phase A signal enhances unit safety by allowing operators to use forced RCS circulation to cool the unit. Isolating ~~CCW~~ component cooling water on the ~~low pressure~~ Phase A signal may force the use of feed and bleed cooling, which could prove more difficult to control. ②

Phase A containment isolation is actuated automatically by SI, or manually via the automatic actuation logic. All process lines penetrating containment, with the exception of ~~CCW~~ component cooling water, essential raw cooling water, and control air, are isolated. ②

~~CCW~~ Component cooling water 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. ②

Manual Phase A Containment Isolation is accomplished by either of two 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. ②

The Phase B signal isolates ~~CCW~~ component cooling water, essential raw cooling water, and control air. This occurs at a relatively high containment pressure that is indicative of a large break LOCA or a SLB. For these events, forced circulation using the RCPs is no longer desirable. Isolating the ~~CCW~~ component cooling water at the higher pressure does not pose a challenge to the containment boundary because the ~~CCW~~ Component Cooling Water 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~~ Component Cooling Water System design and Phase B isolation ensures the ~~CCW~~ Component Cooling Water System is not a potential path for radioactive release from containment. ② ② ②

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~~ ② ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~have been actuated~~. RCP operation will no longer be required and ~~CCW~~ component cooling water 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. ②

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.

a. <u>Containment Isolation - Phase A Isolation</u>

(1) <u>Phase A Isolation - Manual Initiation</u>

Manual Phase A Containment Isolation is actuated by either of two switches in the control room. Either switch actuates both trains. Note that manual initiation of Phase A Containment Isolation also actuates Containment ~~Purge~~ Ventilation Isolation. ②

(2) <u>Phase A Isolation - Automatic Actuation Logic and Actuation Relays</u>

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~~ an accident, 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~~ switches. 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. ② ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

(3) Phase A Isolation - Safety Injection

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.

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

INSERT 4 ②

(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~~ an accident. ② 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~~ hand switches. ② 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.

② **INSERT 4**

The operator can initiate Phase B containment isolation at any time from the control room by simultaneously turning two Phase B & Containment Ventilation Isolation switches in the same train. There are two sets of two switches each in the control room. Simultaneously turning the two switches in either set will actuate Phase B containment isolation in both trains in the same manner as the automatic actuation signal. Two Manual Initiation switches in each train are required to be OPERABLE to ensure no single failure disables the Manual Initiation Function. Note that Manual Initiation of Phase B containment isolation also actuates containment spray and containment vent isolation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

(3) Phase B Isolation - Containment Pressure

The basis for containment pressure MODE applicability is as discussed for ESFAS Function 2.c above.

4. Steam Line Isolation

Isolation of the main steam lines provides protection in the event of a 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 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 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. ②

a. Steam Line Isolation - Manual Initiation

Manual initiation of Steam Line Isolation can be accomplished from the control room. There are ~~two~~ four switches in the control room and ~~either~~ each switch ~~can~~ initiates action to immediately close ~~all~~ its associated MSIV~~s~~. The LCO requires ~~two channels~~ one channel per steam line to be OPERABLE. ②

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 SLB or other accident. 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, there is insufficient energy in the RCS and SGs to experience a SLB or other accident releasing significant quantities of energy. ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

c. Steam Line Isolation - Containment Pressure - High-High ~~2~~ ②

This Function actuates closure of the MSIVs in the event of a LOCA or a 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-High ~~2~~ 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~~ INSERT 5 ~~electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions, and the [NTSP] reflects only steady state instrument uncertainties~~. ② ②

Containment Pressure - High-High ~~2~~ 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-High ~~2~~ setpoint. ② ④ ②

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 a 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.

Steam Line Pressure - Low Function must be OPERABLE in MODES 1, 2, and 3 (~~above~~ when the Steam Line Isolation on Steam Line Pressure, Negative Rate-High is blocked ~~P-11~~), with any main steam valve open, when a secondary side break or stuck open

②

INSERT 5

The transmitters and electronics are located inside the containment annulus, but outside containment, and experience more adverse environmental conditions than if they were located outside containment altogether. However, the environmental effects are less severe than if the transmitters were located inside containment. The NTSP reflects the inclusion of both steady state instrument uncertainties and slightly more adverse environmental instrument uncertainties.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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-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 ④

(2) Steam Line Pressure - Negative Rate – High

Steam Line Pressure - Negative Rate - High provides closure of the MSIVs for a 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, and the Steam Line Isolation on Steam Line Pressure, Low is blocked, 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 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 a SLB or other accident that would result in a release of significant enough quantities of energy to cause a cooldown of the RCS. ② ④

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

While the transmitters may experience elevated ambient temperatures due to a SLB, the trip function is based on rate of change, not the absolute accuracy of the indicated steam pressure. Therefore, the ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ④

~~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)~~

~~These Functions (4.e and 4.f) provide closure of the MSIVs during a 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.~~ ②

~~g.~~ ~~Steam Line Isolation - High Steam Flow Coincident With Safety Injection and Coincident With T_{avg} - Low Low (Two Loop Units)~~

~~This Function provides closure of the MSIVs during a 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.~~

~~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.~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~With the transmitters (d/p cells) typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflect both steady state and adverse environmental instrument uncertainties.~~

~~The main steam line isolates only if the high steam flow signal occurs coincident with a 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 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.~~ ②

~~With the T_{avg} resistance temperature detectors (RTDs) located inside the containment, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflects both steady state and adverse environmental instrumental uncertainties.~~

~~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~~

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~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.~~

~~h. Steam Line Isolation - High High Steam Flow Coincident With Safety Injection (Two Loop Units)~~

~~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 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.~~

~~With the transmitters typically located inside the steam tunnels, it is possible for them to experience adverse environmental conditions during a SLB event. Therefore, the [NTSP] reflects both steady state and adverse environmental instrument uncertainties.~~

~~The main steam lines isolate only if the high steam flow signal occurs coincident with a 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.~~

~~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.~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5. Turbine Trip and Feedwater Isolation

The primary functions of the Turbine Trip and Feedwater Isolation signals are to prevent damage to the turbine due to water in the steam lines, and to stop the excessive flow of feedwater into the SGs. These Functions are 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 Function is actuated when the level in any SG exceeds the high high setpoint, and performs the following functions:

- Trips the main turbine,
- Trips the MFW pumps,
- Initiates feedwater isolation, and
- Shuts the MFW regulating valves and the bypass feedwater regulating valves.

The nominal trip setpoint and allowable value limits are a percentage of the narrow range instrument span for each steam generator.

This Function is actuated by SG Water Level - High High, or by a 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. ②

a. Turbine Trip and Feedwater 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.

b. Turbine Trip and Feedwater Isolation - Steam Generator Water Level - High High (P-14)

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

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

, with a two-out-of-three logic,

single failure in the other channels providing the protection function actuation. ~~Thus, four OPERABLE channels are required to satisfy the requirements with a two-out-of-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 NUREG-1218 (Ref. 8)~~. ②

because

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 ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ④

c. Turbine Trip and Feedwater Isolation - Safety Injection

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 MODES 1 and 2 ~~[~~and 3~~]~~ except when all MFIVs, 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 not in service and this Function is not required to be OPERABLE. ④

MFRV

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) (~~normally~~ not safety related). A low ~~level~~ in the ~~CST~~ will automatically realign the pump suctions to the Essential ~~Service Water (ESW)~~ System (safety related). ~~The AFW System is aligned so that upon a pump start, flow is initiated to the respective SGs immediately.~~ ②

pressure

AFW suction line

Raw Cooling Water (ERCW)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (Solid State Protection System)

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. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~

~~Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.~~ ②

b. ~~c.~~ Auxiliary Feedwater - Steam Generator Water Level - Low Low ②

SG Water Level - Low Low provides protection against a loss of heat sink~~. A~~ due to a feed line break~~, inside or~~ outside of containment, or a loss of MFW, ~~would result~~ which results in a loss of SG water level. ② SG Water Level - Low Low provides input to the SG 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, four OPERABLE channels are required to satisfy the requirements with two-out-of-four logic. For units that have dedicated protection and control channels,~~ only three protection channels, with a two-out-of-three logic, are necessary to satisfy the protective requirements. ~~For other units that have only three channels,~~ because a median signal selector is provided~~ or justification is provided in Reference 8~~.

INSERT 6

~~With the transmitters (d/p cells) located inside containment and thus possibly experiencing adverse environmental conditions (feed line break), the [NTSP] reflects the inclusion of both steady state and adverse environmental instrument uncertainties.~~ ②

INSERT 7

c. ~~d.~~ Auxiliary Feedwater - Safety Injection ②

A 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.

② INSERT 6

With the transmitters located inside containment and thus possibly experiencing adverse environmental conditions (due to a feedline break), the Environmental Allowance Modifier (EAM) was devised. The EAM function (Containment Pressure (EAM) with a setpoint of < 0.5 psig) senses the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low-Low setpoint (Adverse) which reflects the increased transmitter uncertainties due to this environment. The EAM allows the use of a lower Steam Generator Water Level - Low-Low (EAM) setpoint when these conditions are not present, thus allowing more margin for normal operating conditions. Additionally, the NTSP reflects the inclusion of both steady state and adverse environmental instrument uncertainties.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. Two time delays are calculated, based on the number of steam generators indicating less than the Low-Low Level setpoint and the primary side power level. The magnitude of the delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low level trips.

In the event of failure of a Steam Generator Water Level channel, it is placed in the trip condition as input to the Solid State Protection System and does not affect either the EAM or TTD setpoint calculations for the remaining OPERABLE channels. Failure of the Containment Pressure (EAM) channel to a protection set also does not affect the EAM setpoint calculations. This results in the requirement that the operator adjust the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints or actuate the SG Water Level Low-Low setpoint. Failure of the RCS loop ΔT channel input (failure of more than one T_H resistance temperature detectors (RTD) or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the man-machine-interface (MMI) test cart.

There are three Steam Generator Water Level Low-Low channels per steam generator arranged in a two-out-of-three logic. These channels are arranged in four protection sets with each channel of the Containment Pressure (EAM) and RCS Loop ΔT inputting into its associated protection set.

②

INSERT 7

With the transmitters (d/p cells) located inside containment and the accidents the channel provides protection for occurring outside containment, the NTSP reflects only steady state instrument uncertainties. Because the transmitters (d/p cells) are located inside containment, thus possibly experiencing adverse environmental conditions during a feed line break inside containment, the SG Water Level-Low Low Trip Setpoint may not have sufficient margin to account for adverse environmental instrument uncertainties; in this case, AFW pump start will be provided by a Containment Pressure-High SI signal.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

d. ~~e.~~ Auxiliary Feedwater - Loss of Offsite Power ②

A loss of offsite power to the ~~service~~ 6.9 kV Unit-boards (RCP buses) ~~buses~~ will be accompanied by a loss of reactor coolant pumping power and the subsequent need for some method of decay heat removal. The AFW loss of offsite power is detected by a voltage drop on each ~~service~~ 6.9 kV shutdown board ~~bus~~. Loss of power to either ~~service~~ 6.9 kV shutdown board ~~bus~~ will start the turbine driven AFW pump~~s~~ 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. ② ②

INSERT 8 ②

Functions 6.a through 6.~~e~~ d. must be OPERABLE in MODES 1, 2, and 3 to ensure that the SGs remain the heat sink for the reactor. SG Water Level - Low Low in any operating 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 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. ⑤ ② ②

~~f. Auxiliary Feedwater - Undervoltage Reactor Coolant Pump~~

~~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 downstream of each RCP breaker. A loss of power, or an open RCP breaker, on two or more RCPs, 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.~~ ②

e. ~~g.~~ Auxiliary Feedwater - Trip of All Main Feedwater Pumps ②

A Trip of all 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 one ~~two~~ pressure switch~~es~~ on the control ~~air/~~oil line for the speed control system. A low pressure signal from ~~either of~~ this ~~these~~ pressure switch~~es~~ indicates a trip of that pump. ~~Motor~~ ②

②

INSERT 8

The loss-of-voltage relaying on the 6.9 kV shutdown board uses three solid-state voltage sensors in a two-out-of-three voltage sensor logic (27T-S1A, S1B, & S1C) for loss-of-power detection. A two-out-three logic from the voltage sensor channels energizes two parallel separate timing relays with a one-out-of-two logic scheme (LV1 and LV2). These voltage sensors and timing relays provide emergency diesel generator start, load-shed initiation, and subsequent turbine driven auxiliary feedwater (TDAFW) pump start through separate blackout relays (BOX and BOY).

A footnote has been added to clarify that this requirement only applies to shutdown board instrumentation on the same unit. This clarification removes the potential to declare the AFW loss-of-power start instrumentation inoperable for a given unit when only the opposite unit's instrumentation is inoperable.

The AFW turbine-driven pump is considered OPERABLE when one train of the AFW loss of power start function is declared inoperable, in accordance with technical specifications, because both 6.9 kilovolt shutdown board logic trains supply this function.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~driven MFW pumps are equipped with a breaker position sensing channel. An open supply breaker indicates that the pump is not running. Two OPERABLE channels per pump satisfy redundancy requirements with one-out-of-two taken twice logic.~~ ② A trip of all MFW pumps starts the 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.

INSERT 9 ⑤

Function~~s~~ 6.e~~f~~ ~~and 6.g~~ 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 ②

f. ~~h.~~ <u>Auxiliary Feedwater - Pump Suction Transfer on Suction Pressure – Low</u> ②

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. Three ~~Two~~ pressure switches are located on the AFW pump suction line from the CST. A low pressure signal sensed by two of three ~~any one of the~~ switches will cause the emergency supply of water for the ~~both~~ pump~~s~~ to be aligned~~, or cause the AFW pumps~~ to ~~stop until~~ the emergency source of water ~~is aligned~~. ERC~~S~~W (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. ②

Since the detectors are located in an area not affected by HELBs or high radiation, they will not experience any adverse environmental conditions however ~~and~~ the ~~[~~NTSP~~]~~ reflects both ~~only~~ steady state and adverse environmental instrument uncertainties. ② ④

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 10 ②

⑤

INSERT 9

This Function includes two footnotes. The first footnote indicates that MODE 2 applicability is limited to operation when one or more MFW pumps are supplying feedwater to the steam generators (SGs), and the second footnote provides for delaying the entry into the action statement when starting or stopping MFW pumps in MODE 1.

The first footnote limits the Applicability to require the auto-start logic to be operable in MODE 2 only when at least one MFW pump is in service supplying feedwater to the SGs. Because plant conditions at the time of entry into Mode 2 do not allow the MFW pumps to operate, without this footnote the channels would need to be tripped resulting in an AFW start signal, starting the turbine-driven pump in addition to the motor-driven AFW pumps, which is an undesirable situation. This resolves a conflict between the MODE applicability and plant design, which does not support MFW pump operation at the time of entry into MODE 2. Also, modifying the requirement for auto-start of the AFW pumps to be only required when the MFW pumps are in service limits the potential for inadvertent AFW actuations during normal plant startups and shutdowns that could lead to reactivity control issues due to over cooling transients.

The second footnote delays entry into the Required Action for less than minimum channels operable for up to 4 hours. During the time of starting and stopping a second MFW pump, when the pump is in reset, the auto-start function is inoperable. Starting and stopping MFW pumps during plant startup and shutdown is a normal evolution, which will normally be accomplished within a short time. This note is intended to prevent unnecessary entries into the Required Actions, which provides a timeframe to correct unplanned equipment failures. For the normal operating evolution of starting and stopping pumps, the footnote allows a delay of up to 4 hours before entering the Required Action. The evolution should be completed in less time, but the 4 hours provides a reasonable allowance for operating contingencies. If the evolution takes longer than 4 hours, it is probably indicative of an equipment problem and entering the Required Action is appropriate.

②

INSERT 10

g. Auxiliary Feedwater Suction Transfer Time Delays

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. The pressure switch setpoints and the logic time delays for the AFW pump suction switchover were determined to ensure that adequate net positive suction head (NPSH) for the AFW pumps is maintained during the pump suction transfer sequence.

The available NPSH for the pumps is calculated assuming a water level in the supply header that would not be reached until after the time delays are exceeded, even when accounting for the two TDAFW timers in series. The TDAFW pump has two timers because this pump can be switched to either of the two trains in the ERCW system: one timer is for the transfer to one of the two trains. The timers operate in sequence to assure that the TDAFW pump is transferred to one of the ERCW trains.

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.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

a. Automatic Switchover to Containment Sump - 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.

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 ②

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 a 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. ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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~~ containment sump tall strainer submergence. ~~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.~~ ② ②

The RWST level 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 ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ② ④

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. ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------~~ ③
~~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 that automatic switchover is permitted before RWST level decreases below the RWST Level – Low setpoint. This ensures an adequate suction supply to the ECCS pumps by allowing sufficient time for completion of the switchover before vortexing occurs in the RWST. ~~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 ~~[~~NTSP~~]~~ reflects the inclusion of both steady state and environmental instrument uncertainties. ② ② ② ② ④

~~Units only have one of the Functions, 7.b or 7.c.~~
~~--~~ ③

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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.

8. Engineered Safety Feature Actuation System Interlocks

To allow some flexibility in unit operations, several interlocks are included as part of the ESFAS. These interlocks permit 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.

a. Engineered Safety Feature Actuation System Interlocks - Reactor Trip, P-4

The P-4 interlock is enabled when a reactor trip breaker ~~(RTB)~~ ② and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation may be ~~is~~ blocked after a ② 60 ~~[ ]~~ second time delay. ④ 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 reactor trip breakers ~~RTBs~~ have been manually closed. ② The functions of the P-4 interlock are:

- Trip the main turbine,
- Isolate MFW with coincident low T_{avg},
- Prevent automatic reactuation of SI after a manual reset of SI, and ② ⑥
- ~~Transfer the steam dump from the load rejection controller to the unit trip controller, and~~ ②
- Prevent opening of the MFW isolation valves if they were closed on SI or SG Water Level - High High.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

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. There are two P-4 channels arranged in a one-out-of-one logic per channel. ②

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~~ three Functions associated with the reactor trip signal, is required to show that the unit licensing basis safety analysis acceptance criteria are not exceeded. ②

The ~~RTB~~ reactor trip breaker position switches ~~that~~ provide input to the P-4 interlock ~~only function~~ to ~~energize or de-energize or~~ indicate open or close ~~contacts~~. Therefore, this Function has no adjustable trip setpoint with which to associate a ~~[~~NTSP~~]~~ and Allowable Value. ② ④

This Function must be OPERABLE in MODES 1, 2, and 3 when the reactor may be critical or approaching criticality. 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. ②

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 a 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~~ ②

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~these trips by use of the respective manual reset buttons. When the Steam Line Pressure - Low steam line isolation signal is enabled~~ and, the main steam isolation on Steam Line Pressure - Negative Rate - High is disabled. The ~~[~~NTSP~~]~~ reflects only steady state instrument uncertainties. ② ④

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.

~~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.~~ ②

~~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).

BASES

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.~~
~~--~~ ③

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.

setpoint comparator output, contact output,

on a "per" basis

In the event a channel's ~~[~~NTSP~~]~~ 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. ④ ② 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 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.~~
~~--~~ ③

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.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

Condition B applies to manual initiation of:

- SI,
- Containment Spray,
- Phase A Isolation, and
- Phase B Isolation.

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, 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. ②

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,
- Containment Spray,
- Phase A Isolation, and
- Phase B Isolation~~, and~~
- ~~Automatic Switchover to Containment Sump~~.

BASES

ACTIONS (continued)

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 9. 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 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. 10) that 4 hours is the average time required to perform train surveillance. ④

<u>D.1, D.2.1, and D.2.2</u>

Condition D applies to:

- Containment Pressure - High ~~1~~, ②
- Pressurizer Pressure - Low ~~(two, three, and four loop units)~~, ②
- Steam Line Pressure - Low,
- ~~Steam Line Differential Pressure - High,~~
- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low or Coincident With Steam Line Pressure - Low~~, ②
- ~~Containment Pressure - High 2~~,
- Steam Line Pressure - Negative Rate - High,
- ~~High Steam Flow Coincident With Safety Injection Coincident With T_{avg} - Low Low~~, ②

BASES

ACTIONS (continued)

- ~~High High Steam Flow Coincident With Safety Injection,~~ ②

- ~~High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low Low,~~

- ~~SG Water level - Low Low (two, three, and four loop units)~~, and

- ~~[~~SG Water level - High High (P-14) ~~(two, three, and four loop units)~~. ~~]~~ ④

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 9. ②

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 and MODE 4 within the next 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. 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 9. ~~]~~ ④ ④

~~-----------------------------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.~~ ③
~~--~~

BASES

ACTIONS (continued)

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

Condition E applies to:

- Containment Spray Containment Pressure - ~~High 3 (~~High~~,~~-High~~) (two, three, and four loop units)~~, ~~and~~ ②
- Containment Phase B Isolation Containment Pressure - ~~High 3 (~~High~~,~~-High~~).~~, and
- Steam Line Isolation Containment Pressure – High-High

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 bypassed, a single instrumentation channel failure will not spuriously initiate containment spray.

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 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 bypassed condition within 72 ~~6~~ hours, requires the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 ~~72~~ hours. ② 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.

~~[~~ ④ 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 9. ~~]~~ ④

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.~~
~~---~~ ③

INSERT 11

~~F~~ G.1, ~~F~~ G.2.1, and ~~F~~ G.2.2

Condition ~~F~~ G applies to~~:~~ the ②

- ~~Manual Initiation of Steam Line Isolation,~~ ②
- ~~Loss of Offsite Power,~~ ②
- ~~Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low, and~~ ②
- P-4 Interlock.

For the ~~Manual Initiation and the~~ P-4 Interlock Function~~s~~, this action addresses the train orientation of the SSPS. ~~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~~. ② 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 th~~ese~~ Function~~s~~, ② 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 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 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.

②

INSERT 11

F.1 and F.2

Condition F applies to the Steam Line Isolation, Manual Initiation ESFAS Function.

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 this Function, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the associate MSIV is declared inoperable and the associated Required Actions followed for an inoperable MSIV.

BASES

ACTIONS (continued)

~~G~~H.1, ~~G~~H.2.1, and ~~G~~H.2.2 ②

Condition ~~G~~ H applies to the automatic actuation logic and actuation relays for the Steam Line Isolation ~~[~~Turbine Trip and Feedwater Isolation,~~]~~ and AFW actuation Functions. ④

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 9. 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 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 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.

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. 10) assumption that 4 hours is the average time required to perform channel surveillance. ④

~~[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 9. 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~~ ②

BASES

ACTIONS (continued)

~~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.~~

~~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. 10) assumption that 4 hours is the average time required to perform channel surveillance.]~~

~~I.1 and I.2~~

~~Condition I applies to:~~

- ~~[SG Water Level - High High (P-14) (two, three, and four loop units), and]~~
- ~~Undervoltage Reactor Coolant Pump.~~

~~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 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. 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.~~

~~[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 9.]~~

②

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 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 9.~~
~~---~~ ③

INSERT 12
INSERT 13
INSERT 14
INSERT 15 ⑤ ②

N

~~J~~.1 and ~~J~~.2

N

Condition ~~J~~ applies to the AFW pump start on trip of all MFW pumps. ②

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 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. 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 10. ②

INSERT 16 ②

P

~~K~~.1, ~~K~~.2.1, and ~~K~~.2.2 ②

P

Condition ~~K~~ applies to~~:~~ the ②

- ~~RWST Level - Low Low Coincident with Safety Injection, and~~

- RWST Level - Low ~~Low~~ Coincident with Safety Injection and Coincident with Containment Sump Level - High. ②

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~~ comparators to energize to perform their required action. The failure of up to two channels will not prevent the operation of this Function. However, placing ② ②

②

INSERT 12

I.1 and I.2

Condition I applies to the following ESFAS Functions:

- Steam Generator Water Level--Low-Low (Adverse), and
- Steam Generator Water Level--Low-Low (EAM)

A known inoperable channel must be placed in the tripped condition within 6 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.

In addition to placing the channel in the tripped condition, it is necessary to force the use of the shorter TTD by adjustment of the single steam generator time delay calculation (T_S) to match the multiple steam generator time delay calculation (T_M) for the affected protection set within 4 hours.

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.

②

INSERT 13

J.1, J.2, J.3.1, and J.3.2

Condition J applies to the Containment Pressure (EAM) coincidence with Steam Generator Water Level--Low-Low (Adverse) ESFAS Function.

Failure of the Containment Pressure (EAM) channel to a protection set does not affect the EAM setpoint calculations. A known inoperable Containment Pressure channel results in the requirement to adjust the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints for the affected protection set to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoint within 6 hours. ②

An alternative to adjusting the affected Steam Generator Water Level - Low-Low (EAM) trip setpoints to the same value as the Steam Generator Water Level - Low-Low (Adverse) trip setpoints is to place the associated protection set's SG Water Level Low-Low channels in the tripped condition within 6 hours.

If neither of the above Required Actions are completed within their associated Completion Time, then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours and MODE 4 within 18 hours. The allowed Completion Times are reasonable 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. ⑤

INSERT 14

K.1, K.2, K.3.1, and K.3.2

Condition K applies to the RCS Loop ΔT coincidence with SG Water Level – Low-Low.

Failure of the RCS loop ΔT channel input (failure of more than one T_H RTD or failure of a T_C RTD) does not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP within 6 hours. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG level is removed. ②

An alternative to adjusting the threshold power level for zero seconds time delay is to place the affected protection set's SG Water Level Low-Low level channels in the tripped condition within 6 hours.

If neither of the above Required Actions can be completed within their associated Completion Times then the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit be placed in MODE 3 within 12 hours and MODE 4 within 18 hours. The allowed Completion Times are reasonable 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. ⑤

②

INSERT 15

L.1 and L.2

Condition L applies to the Loss of Voltage sensors associated with the Loss of Power AFW pump start ESFAS Function. These are the same sensors for the DG loss of Voltage start.

This function is provided by voltage sensors for each train arranged in a two-out-of-three logic scheme. If a sensor is inoperable, 6 hours is allowed to return it to OPERABLE status.

If the inoperable sensor cannot be restored to OPERABLE status within the specified Completion Time, the associated AFW pump must be declared inoperable. The TDAFW pump is considered OPERABLE when at least one train of the AFW loss of power start function is OPERABLE because both 6.9 kV shutdown board logic trains supply this function.

M.1.1, M.1.2, and M.2

Condition M applies to the Loss of Voltage sensors and load shed timers associated with the Loss of Power AFW pump start ESFAS Function. These are the same sensors and timers for the DG loss of Voltage start.

This function is provided by voltage sensors for each train arranged in a two-out-of-three logic scheme with associated load shed timers arranged in a one-out-of-two logic. If two or more voltage sensors or one required load shed timer are inoperable, 1 hour is allowed to return the inoperable channel(s) to OPERABLE status.

If the inoperable sensors cannot be made OPERABLE such that only one sensor is inoperable or one required load shed timer cannot be made OPERABLE within the specified Completion Time, the associated auxiliary feedwater pump must be declared inoperable. The AFW turbine-driven pump is considered OPERABLE when at least one train of the AFW loss of power start function is OPERABLE because both 6.9 kV shutdown board logic trains supply this function.

INSERT 16

The Required Actions are modified by a note delaying the entry into the Required Action statement when starting or stopping MFW pumps. Starting and stopping MFW pumps during plant startup and shutdown is a normal evolution, which will normally be accomplished within a short time. It was not intended to result in unnecessary entries into the Required Actions, which provides a timeframe to correct unplanned equipment failures. The 4 hours is consistent with similar allowances in other SQN TSs. ⑦

O.1

Condition O applies to the following ESFAS Functions:

- Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low,
- Auxiliary Feedwater Suction Transfer Time Delays, Motor-Driven Pump, and
- Auxiliary Feedwater Suction Transfer Time Delays, Turbine-Driven Pump.

These functions are provided by three pressure sensors located on the suction of each AFW pump arranged in a two-out-of-three logic scheme. The motor driven AFW pumps have one time delay, while the TDAFW pump has two. The motor driven and the first TDAFW pump time delays prevent spurious transfer. The TDAFW Pump second time delay ensures ERCW Train A valves stroke open sufficiently. ②

If a pressure sensor channel or a time delay channel is inoperable, the associated AFW pump must be declared inoperable immediately.

BASES

ACTIONS (continued)

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 ④ ensure 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 ~~[~~6~~]~~ hour Completion Time is ④ justified in Reference 11. If the channel cannot be returned to OPERABLE status or placed in the bypass condition within 6 hours, the ② unit must be brought to MODE 3 within the following ~~[~~6~~]~~ hours and ④ 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.

~~[~~ 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 11.~~]~~ ④ ④

~~-----------------------------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 11.~~
~~---~~ ③

~~L~~Q.1, ~~L~~Q.2.1, and ~~L~~Q.2.2

Condition ~~L~~Q applies to the P-11 ~~and P-12 [and P-14]~~ interlock~~s~~. ② ④

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

BASES

ACTIONS (continued)

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.

INSERT 17

⑤

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.~~
~~--~~

③

~~-------------------------REVIEWER'S NOTE-------------------------~~
~~Notes b and c are applied to the setpoint verification Surveillances for all Engineered Safety Feature Actuation System (ESFAS) Instrumentation Function in Table 3.3.2-1 unless one or more of the following exclusions apply:~~

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

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

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

~~--~~

③

⑤

INSERT 17

R.1 and R.2

If the inoperable channel cannot be placed in the tripped condition or the TTD of the single steam generator time delay calculation (T_S) adjusted to match the multiple steam generator time delay calculation (T_M) for the affected protection set within the specified Completion Time, the unit must be placed in a MODE where these Functions are not required OPERABLE. This requires the unit placed in MODE 3 within 6 hours and MODE 4 within 12 hours. The allowed Completion Times are reasonable 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.

S.1 and S.2

Condition S applies to the automatic actuation logic and actuation relays for the Automatic Switchover to Containment Sump.

This action addresses the train orientation of the SSPS and the master and slave relays. If one train is inoperable 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 12 hours and in MODE 5 within an additional 30 hours (42 hours total time). The Completion Times are reasonable 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.

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~
~~--~~

③

SR 3.3.2.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 hours is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during~~

⑧

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~normal operational use of the displays associated with the LCO required channels.~~

~~OR~~

⑧

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

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

③

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST 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. 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 12.~~

~~OR~~

⑧

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

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

③

~~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~~

②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~ ②

~~OR~~

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

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

SR 3.3.2.4 3 ②

SR 3.3.2.4 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. The time allowed for the testing on a STAGGERED TEST BASIS (4 hours) is justified in Reference 12. ~~[The Frequency of 92 days is justified in Reference 10.~~ ⑧

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~5~~ 4 ②

SR 3.3.2.~~5~~ 4 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found conservative with respect to the Allowable Values specified in Table 3.3.2-1. 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.

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.

The "as-found" and "as-left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

~~[The Frequency of 184 days is justified in Reference 12.~~ ⑧

~~OR~~

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

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

SR 3.3.2.~~5~~ 4 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~--~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

SR 3.3.2.~~6~~ 5 ②

SR 3.3.2.~~6~~ 5 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. ~~[The Frequency of 92 days is adequate, based on industry operating experience, considering instrument reliability and operating history data.~~

~~OR~~ ⑧

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.2.~~7~~ 6 ②

SR 3.3.2.~~7~~ 6 is the performance of a TADOT. This test is a check of the Loss of Offsite Power~~, Undervoltage RCP, and AFW Pump Suction Transfer on Suction Pressure - Low~~ Function~~s~~. ~~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.

The test also includes trip channels 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 of 92 days is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.~~ ⑧

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~8~~ 7 ②

SR 3.3.2.~~8~~ 7 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. 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 of 18 months is adequate, based on industry operating experience and is consistent with the typical refueling cycle.~~ ⑧

~~OR~~

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

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

~~SR 3.3.2.8 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the [NTSP]. Where a setpoint more conservative than the [NTSP] is used in the plant surveillance~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the [NTSP], then the channel shall be declared inoperable.~~ ②

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~---~~ ③

~~The second Note also requires that the [NTSP and the] methodologies for calculating the as-left and the as-found tolerances be in [insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference].~~ ②

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.

SR 3.3.2.8~~9~~ ②

SR 3.3.2.8~~9~~ is the performance of a CHANNEL CALIBRATION.

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.

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.

~~[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.~~

~~OR~~ ⑧

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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.

SR 3.3.2.~~9~~8 is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the ~~[~~NTSP~~]~~. Where a setpoint more conservative than the ~~[~~NTSP~~]~~ is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the ~~[~~NTSP~~]~~, then the channel shall be declared inoperable. ② ④ ④ ④

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~The bracketed section '[NTSP and the]' of the sentence in Note (c) in Table 3.3.2-1 is not required in plant-specific Technical Specifications which include a [Nominal Trip Setpoint] column in Table 3.3.2-1.~~
~~---~~ ③

The second Note also requires that the ~~[NTSP and the]~~ methodologies for calculating the as-left and the as-found tolerances be in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. ④

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~10~~ 9 ②

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~~ Updated Final Safety Analysis Report, Section 7.3 (Ref. 13). 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). ②

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 U 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. ②

~~-----------------------------REVIEWER'S NOTE---~~
~~Applicable portions of the following Bases are applicable for plants adopting WCAP-13632-P-A (Ref. 14). and/or WCAP-14036-P (Ref. 15).~~
~~---~~ ③

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. 14) 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. 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.

~~[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.~~ ⑧

~~OR~~

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

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

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching ~~[1000]~~ 842 psig in the SGs. ④

SR 3.3.2.~~11~~ 10 ②

SR 3.3.2.~~11~~ 10 is the performance of a TADOT as described in SR 3.3.2.~~8~~ 7, except that it is performed for the P-4 Reactor Trip Interlock, and the

BASES

SURVEILLANCE REQUIREMENTS (continued)

Frequency is once per reactor trip breaker ~~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 reactor trip breaker ~~RTB~~ is cycled. ②

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. Regulatory Guide 1.105, "Setpoint for Safety Related Instrumentation," Revision 3.
2. U FSAR, Chapter ~~[~~6~~]~~. ② ④
3. U FSAR, Chapter ~~[~~7~~]~~. ② ④
4. U FSAR, Chapter ~~[~~15~~]~~. ② ④
5. IEEE-279-1971.
6. 10 CFR 50.49.
7. Calculation SQN-EEB-PL&S, Precautions, Limitations, and Setpoints for NSSS ~~Plant-specific setpoint methodology study~~. ②
8. NUREG-1218, April 1988.
9. WCAP-14333-P-A, Rev. 1, October 1998.
10. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.
11. License Amendment dated June 13, 1995, Issuance of Amendments to Technical Specifications – Sequoyah Nuclear Plant, Units 1 and 2 (TAC NOS. M91990 and 91991) (ML013320052) ~~[Plant specific evaluation reference.]~~ ④
12. WCAP-15376, Rev. 0. October 2000.
13. UFSAR, Section 7.3 ~~Technical Requirements Manual, Section 15, "Response Times."~~ ②
14. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.
15. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.2 BASES, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

1. NUREG 1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0 provides two sets of specification for Section 3.3.2; one for adoption "Without a Setpoint Control Program," (3.3.2.A) the other for adoption "With a Setpoint Control Program," (3.3.2.B). This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation and is removed.

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

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

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

5. Changes are made to be consistent with changes made to the Specification.

6. Editorial changes are made for clarity.

7. Changes made to explain the basis for the Note added to the Required Actions consistent with NRC approval contained in SQN License Amendment 319/312, reference ADAMS Accession Nos. ML082401385 and ML082401446.

8. ISTS SR 3.3.2.1 through ISTS 3.3.2.11 (ITS SR 3.3.2.1 through ITS 3.3.2.10) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.3.2.1 through ITS 3.3.2.10 is "In accordance with the Surveillance Frequency Control Program."

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGE L12 and L13

SQN is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Most changes to the SQN current Technical Specifications (CTS) incorporate industry changes made to NUREG-1431 and are covered by generic No Significant Hazards Considerations. Proposed changes that are not considered included in the conversion to NUREG-1431 are outside of the generic evaluation and require separate evaluation, as is the case with these less restrictive changes (L12 and L13). The proposed change involves making the Current Technical Specifications (CTS) less restrictive. Below are the descriptions of these less restrictive changes and the determination of No Significant Hazards Considerations for conversion to NUREG-1431.

CTS Table 3.3-3 ACTION 37 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP. This action is applicable to CTS Table 3.3-3 Functional Unit 6.c.i.c (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Motor-Driven Pumps, RCS Loop ∆T) and Functional Unit 6.c.ii.c (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Turbine-Driven Pump, RCS Loop ∆T). ITS 3.3.2 Required Action K.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

The purpose of CTS Table 3.3-3 ACTION 37 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection set's Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action K.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-3 ACTION 37 and the proposed ITS Required Action K.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

CTS Table 3.3-3 ACTION 38 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Functional Unit 6.c.i.d (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Motor-Driven Pumps, Containment Pressure (EAM)) and Functional Unit 6.c.ii.d (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Turbine-Driven Pump, Containment Pressure (EAM)). ITS 3.3.2 Required Action J.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

The purpose of CTS Table 3.3-3 ACTION 38 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level -- Low-Low level channels in the tripped condition. Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. The ITS Required Action J.2 Completion Time of 6 hours is consistent with CTS TABLE 3.3-3 ACTION 38 and the proposed ITS Required Action J.1. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

Tennessee Valley Authority (TVA) has evaluated whether or not a significant hazards consideration is involved with these proposed Technical Specification changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed change relaxes the Required Actions for the Engineered Safety Feature Actuation System (ESFAS) Instrumentation, Auxiliary Feedwater Main Steam Generator Water Level—Low-Low, when an RCS Loop ΔT or a Containment Pressure (EAM) channel is inoperable. Placing the affected Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels in trip uses installed equipment designed specifically for placing the channels in trip. This change will not affect the probability of an accident, because the OPERABLE Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will continue to perform the safety function the instrumentation is required to perform. The Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are not initiators of any accident sequence analyzed in the Updated Final Safety Analysis Report (UFSAR). Rather, Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are used to mitigate accidents. The consequences of an analyzed accident will not be significantly increased since the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will be maintained to ensure the availability of the required instrumentation to mitigate accidents assumed in the UFSAR. Operation in accordance with the proposed TS will ensure that sufficient Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are OPERABLE as required to support the unit's required features. Therefore, the mitigating functions supported by the Auxiliary Feedwater Main Steam Generator Water Level—Low-Low instrumentation will continue to provide the protection assumed by the accident analysis. The integrity of fission product barriers, plant configuration, and operating procedures as described in the UFSAR will not be affected by the proposed changes. Thus, the consequences of previously analyzed accidents will not be significantly increased by implementing these changes. Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No

The proposed change relaxes the Required Actions for the ESFAS Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels. The remaining Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are required to be OPERABLE to support the associated unit's required features. This change will not physically alter the plant (no new or different type of equipment will be installed). The proposed changes will maintain the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels to ensure the availability of the equipment required to mitigate accidents assumed in the UFSAR. Therefore, operation of the facility in accordance with this proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed change relaxes the Required Actions for the ESFAS Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels. The remaining Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels are required to be OPERABLE to support the associated unit's required features. The margin of safety is not affected by this change because the minimum requirements for Auxiliary Feedwater Main Steam Generator Water Level—Low-Low channels will be maintained to ensure the availability of the required Auxiliary Feedwater Main Steam Generator Water Level—Low-Low instrumentation to shutdown the reactor and maintain it in a safe shutdown condition after an abnormal operational transient or postulated design basis accident. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

ATTACHMENT 3

ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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

INSTRUMENTATION

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.3 3.3.3.7 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2 and 3.

ACTIONS ACTION: As shown in Table 3.3-10

Add proposed ACTIONS Note A02

Add proposed ACTION B L01

SURVEILLANCE REQUIREMENTS

SR Note 4.3.3.7 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE:

SR 3.3.3.1 a. ~~Every 31 days~~ by performance of a CHANNEL CHECK, and

Add proposed SR 3.3.3.2 Note 1 L02

SR 3.3.3.2 b. ~~Every 18 months~~ by performance of a CHANNEL CALIBRATION.*

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.3.2 Note 2 *For Containment Area Radiation Monitors, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/h ~~and a single calibration check of the detector below 10R/h with either an installed or portable gamma source~~. LA02

ITS A01 ITS 3.3.3

Table 3.3.3-1

TABLE 3.3-10

ACCIDENT MONITORING INSTRUMENTATION

	INSTRUMENT	~~TOTAL NO. OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	ITS ACTION
1	1. Reactor Coolant T_{HOT} (Wide Range) ~~(Instrument Loops 68-001,-024,-043,-065)~~	~~4(1/RCS Loop)~~	4~~(1/RCS Loop)~~	1	A, B, C, and H
2	2. Reactor Coolant T_{COLD} (Wide Range) ~~(Instrument Loops 68-018,-041,-060,-083)~~	~~4(1/RCS Loop)~~	4~~(1/RCS Loop)~~	1	A, B, C, and H
3	3. Containment Pressure (Wide Range) ~~(Instrument Loops 30-310,-311)~~	~~2~~	2	1	A, B, C, and H
4	4. Containment Pressure (Narrow Range) ~~(Instrument Loops 30-044,-045)~~	~~2~~	2	1	A, B, C, and H
5	5. Refueling Water Storage Tank Level ~~(Instrument Loops 63-050,-051)~~	~~2~~	2	1	A, B, C, and H
6	6. Reactor Coolant Pressure (Wide Range) ~~(Instrument Loops 68-062,-066,-069)~~	~~3~~	3	2	A, B, C, D, and H
7	7. Pressurizer Level (Wide Range) ~~(Instrument Loops 68-320,-335,-339)~~	~~3~~	3	2	A, B, C, D, and H
8	8. Steam Line Pressure ~~(Instrument Loops 1-002A,-002B,-009A,-009B,-020A,-020B,-027A,-027B)~~	~~2/steam line~~	2/steam line	1	A, B, C, and H
9	9. Steam Generator Level - (Wide Range) ~~(Instrument Loops 3-043,-056,-098,-111)~~	~~4(1/steam generator)~~	4~~(1/steam generator)~~	1	A, B, C, and H
10	10. Steam Generator Level - (Narrow Range) ~~(Instrument Loops 3-039,-042,-052,-055,-094,-097,-107,-110)~~	~~2/steam generator~~	2/steam generator	1	A, B, C, and H
11	11. Auxiliary Feedwater				
	a. Flow Rate ~~(Instrument Loops 3-163,-155,-147,-170)~~	~~1/steam generator~~	1/steam generator	5	A, B, E, and H
	b. Valve Position Indication ~~(Instrument Loops 3-164,-164A,-172,-156,-156A,-173,-148,-148A,-174,-171,-171A,-175)~~	~~3/steam generator~~	1 ~~3~~/steam generator	5	A, B, E, and H

LA03

LA04

LA04

A03

LA05

July 9, 1992

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ITS A01 ITS 3.3.3

Table 3.3.3-1

TABLE 3.3-10 (Continued)

ITS ACTION

ACCIDENT MONITORING INSTRUMENTATION

LA03

	INSTRUMENT	~~TOTAL NO OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	ITS ACTION
12	12. Reactor Coolant System Subcooling Margin Monitor ~~(Instrument Loops 94-101, -102)~~	~~2~~	2	1	A, B, C, and H
13	13. Containment Water Level (Wide Range) ~~(Instrument Loops 63-178, -179)~~	~~2~~	2	1	A, B, C, and H
14	14. Incore Thermocouples	~~65~~			
	a. Core Quadrant (1)		2~~(1/Train)~~	1	A, B, C, and H
	b. Core Quadrant (2)		2~~(1/Train)~~	1	A, B, C, and H
	c. Core Quadrant (3)		2~~(1/Train)~~	1	A, B, C, and H
	d. Core Quadrant (4)		2~~(1/Train)~~	1	A, B, C, and H
15	15. Reactor Vessel Level Instrumentation	~~6~~			
	a. Dynamic Range ~~(Instrument Loops 68-367, 370)~~		2	1	A, B, C, and H
	b. Lower Range ~~(Instrument Loops 68-368, 371)~~		2	1	A, B, C, and H
	c. Upper Range ~~(Instrument Loops 68-369, 372)~~		2	1	A, B, C, and H
16	16. Containment Area Radiation Monitors				
	a. Upper Compartment ~~(Instrument Loops 90-271, -272)~~	~~2~~	1	4	F and I
	b. Lower Compartment ~~(Instrument Loops 90-273, -274)~~	~~2~~	1	4	F and I

LA04

(c) A04

LA05

Add proposed Table 3.3.3-1 Footnote (c) A04

ITS

A01

ITS 3.3.3

Table 3.3.3-1

TABLE 3.3-10 (Continued)

ITS ACTION

ACCIDENT MONITORING INSTRUMENTATION

LA03

	INSTRUMENT	~~TOTAL NO. OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	ITS ACTION
17	17. Neutron Flux				
	a. Source Range ~~(Instrument Loops 92-5001, -5002)~~	~~2~~	2#	1	A, B, C, and H
	b. Intermediate Range ~~(Instrument Loops 92-5003, -5004)~~	~~2~~	2	1	A, B, C, and H
18	18. ERCW to AFW Valve Position				
	a. Motor Driven Pumps ~~(Instrument Loops 3-116A, -116B, -126A, -126B)~~	~~1/Train/Pump (2 Valves/Train)~~	2 ~~1/Train/Pump (2 Valves/Train)~~	1	A, B, C, and H
	b. Turbine Driven Pumps ~~(Instrument Loops 3-136A, -136B, -179A, -179B)~~	~~2 Trains (2 Valves/Train)~~	2 ~~2 Trains (2 Valves/Train)~~	1	A, B, C, and H
19	19. Containment Isolation Valve Position ~~(Panels TR-A XX-55-6K & TR-B XX-55-6L)~~	~~1/Valve~~	(b) 2 per penetration flow path ~~1/Valve~~##	3	A, C, and H

A05

LA04

A06

A06

LA05

Table 3.3.3-1
Footnote (d)

#Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

##Not required for isolation valves ~~that are~~ 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.

Table 3.3.3-1
Footnote (a)

L03

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

A06

ITS

A01

ITS 3.3.3

TABLE 3.3-10 (Continued)

ACTION STATEMENTS

ACTION 1 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from Tables 3.3-1 and 3.3-3, and LCO 3.3.3.5 since they may contain more restrictive actions.~~

A07

ACTION A

ACTION B

a. With the number of channels one less than the minimum channels required, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours, and in HOT SHUTDOWN within the next 6 hours.~~

Initiate action in accordance with Specification 5.6.5

L01

ACTION C

ACTION H

b. With the number of channels two less than the minimum channels required, restore at least one inoperable channel to OPERABLE status within 7 days, or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION 2 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from Tables 3.3-1 since it may contain more restrictive actions.~~

A07

ACTION A

ACTION B

a. With the number of channels one less than the minimum channels required, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.~~

Initiate action in accordance with Specification 5.6.5

L01

ACTION C

ACTION H

b. With the number of channels two less than the minimum channels required, restore at least one inoperable channel to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION D

ACTION H

c. With the number of channels three less than the minimum channels required, restore one channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

A07

ACTION 3 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from LCO 3.6.3 since it may contain more restrictive actions.~~

A06

ACTION A

Table 3.3.3-1 Footnote (a)

a. With the accident monitoring indication for one of the penetration ~~inboard or outboard~~ valve~~(s)~~ inoperable, restore the inoperable valve(s) accident indication to OPERABLE status within 30 days, or isolate each affected penetration within 30 days by use of at least one deactivated automatic valve secured in the isolated position, or isolate each

TABLE 3.3-10 (Continued)

ACTION STATEMENTS
(Continued)

Initiate action in accordance with Specification 5.6.5 L01

Table 3.3.3-1 Footnote (a) affected penetration within 30 days by use of at least one closed manual valve or blind flange, ~~or be in at least HOT STANDBY within the next 6 hours and~~

ACTION B ~~HOT SHUTDOWN within the next 6 hours~~.

two A06

ACTION C ### b. With the accident monitoring indication for ~~both an inboard and outboard~~ valve~~(~~s~~)~~ on the same penetration inoperable, restore at least the inboard or outboard inoperable valve(s) indication to OPERABLE status within 7 days, or

Table 3.3.3-1 Footnote (a) isolate each affected penetration within 7 days by use of at least one deactivated automatic valve secured in the isolated position, or isolate each affected penetration within 7 days by use of at least one closed manual valve or blind flange, or be in at least HOT STANDBY within the next 6 hours and

ACTION H HOT SHUTDOWN within the next 6 hours.

Table 3.3.3-1 Footnote (b) ### ~~On a penetration where accident indication is declared INOPERABLE on a valve but on the opposite side of the penetration an accident indication valve does not exist (such as with a closed system or a check valve), only ACTION 3(a) must be entered.~~ A06 ~~However, valves FCV-63-158 & -172 are both inboard penetration valves, but if both valves have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status. Valves FCV-30-46 & VLV-30-571, FCV-30-47 & VLV-30-572, and FCV-30-48 & VLV-30-573 are all outboard penetration valves, but if both valves have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status.~~ LA06

TABLE 3.3-10 (Continued)

ACTION STATEMENTS
(Continued)

ACTION F

ACTION 4 - With the number of channels less than the minimum channels required, initiate an alternate method of monitoring containment area radiation within 72 hours and either restore the inoperable channel(s) to OPERABLE status within 30 days, or prepare and submit a special report to the Commission pursuant to Specification 6.9.2.1 ~~within the next 14 days that provides actions taken, cause of the inoperability, and plans and schedule for restoring the channels to OPERABLE status~~.

ACTION I

See ITS 5.6.5

ACTION 5 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from LCO 3.3.3.5 since it may contain more restrictive actions.~~

A07

ACTION A

a. With the number of channels on one or more steam generators less than the minimum channels required for either flow rate or valve position, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.~~

ACTION B

Initiate action in accordance with Specification 5.6.5

L01

ACTION E

b. With the number of channels on one or more steam generators less than the minimum channels required for flow rate and valve position, restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION H

Ⓐ01

INSTRUMENTATION

FIRE DETECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 This Specification is deleted.

A01

TABLE 3.3-11

FIRE DETECTION INSTRUMENTS

This Table is deleted.
(Pages 3/4 3-59 through 3/4 3-69 deleted)

INSTRUMENTATION

DELETED

LIMITING CONDITION FOR OPERATION

3.3.3.9 This Specification is deleted. The Tables 3.3-12 and 4.3-8 are also deleted.

INSTRUMENTATION

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.3 3.3.3.7 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2 and 3.

ACTIONS ACTION: As shown in Table 3.3-10

Add proposed ACTIONS Note A02

Add proposed ACTION B L01

SURVEILLANCE REQUIREMENTS

SR Note 4.3.3.7 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE:

SR 3.3.3.1 a. ~~Every 31 days~~ by performance of a CHANNEL CHECK, and

Add proposed SR 3.3.3.2 Note 1 L02

SR 3.3.3.2 b. ~~Every 18 months~~ by performance of a CHANNEL CALIBRATION.*

In accordance with the Surveillance Frequency Control Program LA01

SR 3.3.3.2 Note 2 * For Containment Area Radiation Monitors, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/h ~~and a single point calibration of the detector below 10R/h with either an installed or portable gamma source~~. LA02

ITS

Table 3.3.3-1

A01

ITS 3.3.3

ITS ACTION

TABLE 3.3-10

ACCIDENT MONITORING INSTRUMENTATION

LA03

LA04

ITS	INSTRUMENT	~~TOTAL NO. OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	ITS ACTION
1	1. Reactor Coolant T_{HOT} (Wide Range) ~~(Instrument Loops 68-001,-024,-043,-065)~~	~~4(1/RCS Loop)~~	4~~(1/RCS Loop)~~	1	A, B, C, and H
2	2. Reactor Coolant T_{COLD} (Wide Range) ~~(Instrument Loops 68-018,-041,-060,-083)~~	~~4(1/RCS Loop)~~	4~~(1/RCS Loop)~~	1	A, B, C, and H
3	3. Containment Pressure (Wide Range) ~~(Instrument Loops 30-310,-311)~~	~~2~~	2	1	A, B, C, and H
4	4. Containment Pressure (Narrow Range) ~~(Instrument Loops 30-044,-045)~~	~~2~~	2	1	A, B, C, and H
5	5. Refueling Water Storage Tank Level ~~(Instrument Loops 63-050,-051)~~	~~2~~	2	1	A, B, C, and H
6	6. Reactor Coolant Pressure (Wide Range) ~~(Instrument Loops 68-062,-066,-069)~~	~~3~~	3	2	A, B, C, D, and H
7	7. Pressurizer Level (Wide Range) ~~(Instrument Loops 68-320,-335,-339)~~	~~3~~	3	2	A, B, C, D, and H
8	8. Steam Line Pressure ~~(Instrument Loops 1-002A,-002B,-009A,-009B,-020A,-020B,-027A,-027B)~~	~~2/steam line~~	2/steam line	1	A, B, C, and H
9	9. Steam Generator Level - (Wide Range) ~~(Instrument Loops 3-043,-056,-098,-111)~~	~~4(1/steam generator)~~	4~~(1/steam generator)~~	1	A, B, C, and H
10	10. Steam Generator Level - (Narrow Range) ~~(Instrument Loops 3-039,-042,-052,-055,-094,-097,-107,-110)~~	~~2/steam generator~~	2/steam generator	1	A, B, C, and H
11	11. Auxiliary Feedwater a. Flow Rate ~~(Instrument Loops 3-163,-155,-147,-170)~~	~~1/steam generator~~	1/steam generator	5	A, B, E, and H
	b. Valve Position Indication ~~(Instrument Loops 3-164,-164A,-172,-156,-156A,-173,-148,-148A,-174,-171,-171A,-175)~~	~~3/steam generator~~	1 ~~3~~/steam generator	5	A, B, E, and H

LA04

A03

LA05

ITS

Table 3.3.3-1

A01

ITS 3.3.3

ITS ACTION

TABLE 3.3-10 (Continued)

ACCIDENT MONITORING INSTRUMENTATION

LA03

ITS	INSTRUMENT	~~TOTAL NO. OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	ITS ACTION
12	12. Reactor Coolant System Subcooling Margin Monitor ~~(Instrument Loops 94-101, -102)~~	~~2~~	2	1	A, B, C, and H
13	13. Containment Water Level (Wide Range) ~~(Instrument Loops 63-178, -179)~~	~~2~~	2	1	A, B, C, and H
14	14. Incore Thermocouples	~~65~~			
	a. Core Quadrant (1)		2~~(1/Train)~~(c)	1	A, B, C, and H
	b. Core Quadrant (2)		2~~(1/Train)~~(c)	1	A, B, C, and H
	c. Core Quadrant (3)		2~~(1/Train)~~(c)	1	A, B, C, and H
	d. Core Quadrant (4)		2~~(1/Train)~~(c)	1	A, B, C, and H
15	15. Reactor Vessel Level Instrumentation System	~~6~~			
	a. Dynamic Range ~~(Instrument Loops 68- 367, 370)~~		2	1	A, B, C, and H
	b. Lower Range ~~(Instrument Loops 68-368, 371)~~		2	1	A, B, C, and H
	c. Upper Range ~~(Instrument Loops 68-369, 372)~~		2	1	A, B, C, and H
16	16. Containment Area Radiation Monitors				
	a. Upper Compartment ~~(Instrument Loops 90-271, -272)~~	~~2~~	1	4	F and I
	b. Lower Compartment ~~(Instrument Loops 90-273, -274)~~	~~2~~	1	4	F and I

LA04

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Add proposed Table 3.3.3-1 Footnote (c)

A04

ITS

A01

ITS 3.3.3

Table 3.3.3-1

TABLE 3.3-10 (Continued)

ITS ACTION

ACCIDENT MONITORING INSTRUMENTATION

LA03

	INSTRUMENT	~~TOTAL NO. OF CHANNELS~~	MINIMUM CHANNELS REQUIRED	ACTION	
17	17. Neutron Flux				
	a. Source Range ~~(Instrument Loops 92-5001, -5002)~~	~~2~~	2#	1	A, B, C, and H
	b. Intermediate Range ~~(Instrument Loops 92-5003, -5004)~~	~~2~~	2	1	A, B, C, and H
18	18. ERCW to AFW Valve Position				
	a) Motor Driven Pumps ~~(Instrument Loops 3-116A, -116B, -126A, -126B)~~	~~1/Train/Pump (2 Valves/Train)~~	2 ~~1/Train/Pump (2 Valves/Train)~~	1	A, B, C, and H
	b) Turbine Driven Pumps ~~(Instrument Loops 3-136A, -136B, -179A, -179B)~~	~~2 Trains (2 Valves/Train)~~	2 ~~2 Trains (2 Valves/Train)~~	1	A, B, C, and H
19	19. Containment Isolation Valve Position ~~(Panels TR-A XX-55-6K & TR-B XX-55-6L)~~	~~1/Valve~~	(b) 2 per penetration flow path ~~1/Valve~~##	3	A, C, and H

A05

LA04

A06

A06

LA05

Table 3.3.3-1 Footnote (d)

\# Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

Table 3.3.3-1 Footnote (a)

\## Not required for isolation valves ~~that are~~ 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.

L03

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

A06

TABLE 3.3-10 (Continued)

ACTION STATEMENTS

ACTION 1 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from Tables 3.3-1 and 3.3-3, and LCO 3.3.3.5 since they may contain more restrictive actions.~~ A07

ACTION A a. With the number of channels one less than the minimum channels required, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours~~. Initiate action in accordance with Specification 5.6.5 L01

ACTION B

ACTION C b. With the number of channels two less than the minimum channels required, restore at least one inoperable channel to OPERABLE status within 7 days or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION H

ACTION 2 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from Tables 3.3-1 since it may contain more restrictive actions.~~ A07

ACTION A a. With the number of channels one less than the minimum channels required, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours~~. Initiate action in accordance with Specification 5.6.5 L01

ACTION B

ACTION C b. With the number of channels two less than the minimum channels required, restore at least one inoperable channel to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION H

ACTION D c. With the number of channels three less than the minimum channels required, restore one channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION H

ACTION 3 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from LCO 3.6.3 since it may contain more restrictive actions.~~ A07

ACTION A ### a. With the accident monitoring indication for one of the penetration ~~inboard or outboard~~ valve~~(~~s~~)~~ inoperable, restore the inoperable valve(s) accident indication to OPERABLE status within 30 days, or isolate each affected penetration within 30 days by use of at least one deactivated automatic valve secured in the isolated position, or isolate each A06

Table 3.3.3-1 Footnote (a)

ITS

A01

ITS 3.3.3

TABLE 3.3-10 (Continued)

ACTION STATEMENTS

(Continued)

Initiate action in accordance with Specification 5.6.5

L01

Table 3.3.3-1 Footnote (a)

ACTION B

affected penetration within 30 days by use of at least one closed manual valve or blind flange, or ~~be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the next 6 hours~~.

two

A06

ACTION C

b. With the accident monitoring indication for ~~both an inboard and outboard~~ valve~~(s)~~ on the same penetration inoperable, restore at least the inboard or outboard inoperable valve(s) indication to OPERABLE status within 7 days, or isolate each affected penetration within 7 days by use of at least one deactivated automatic valve secured in the isolated position, or isolate each affected penetration within 7 days by use of at least one closed manual valve or blind flange, or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the next 6 hours.

Table 3.3.3-1 Footnote (a)

ACTION H

Table 3.3.3-1 Footnote (b)

~~On a penetration where accident indication is declared INOPERABLE on a valve but on the opposite side of the penetration an accident indication valve does not exist (such as with a closed system or a check valve), only ACTION 3(a) must be entered.~~ ~~However, valves FCV-63-158 & -172 are both inboard penetration valves, but if both valves have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status. Valves FCV-30-46 & VLV-30-571, FCV-30-47 & VLV-30-572, and FCV-30-48 & VLV-30-573 are all outboard penetration valves, but if both valves have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status.~~

A06

LA06

TABLE 3.3-10 (Continued)

ACTION STATEMENTS
(Continued)

ACTION F

ACTION 4 - With the number of channels less than the minimum channels required, initiate an alternate method of monitoring containment area radiation within 72 hours and either restore the inoperable channel(s) to OPERABLE status within 30 days, or prepare and submit a special report to the Commission pursuant to Specification 6.9.2.1 ~~within 14 days that provides actions taken, cause of the inoperability, and plans and schedule for restoring the channels to OPERABLE status~~.

ACTION I

See ITS 5.6.5

ACTION 5 - ~~NOTE:~~ ~~Also refer to the applicable action requirements from LCO 3.3.3.5 since it may contain more restrictive actions.~~

A07

ACTION A

a. With the number of channels on one or more steam generators less than the minimum channels required for either flow rate or valve position, restore the inoperable channel to OPERABLE status within 30 days or ~~be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours~~.

ACTION B

Initiate action in accordance with Specification 5.6.5

L01

ACTION E

b. With the number of channels on one or more steam generators less than the minimum channels required for flow rate and valve position, restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

ACTION H

INSTRUMENTATION

FIRE DETECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 This Specification is deleted.

TABLE 3.3-11
FIRE DETECTION INSTRUMENTS

This Table is deleted.
(Pages 3/4 3-60 through 3/4 3-67a)

A01

INSTRUMENTATION

DELETED

LIMITING CONDITION FOR OPERATION

3.3.3.9 This Specification is deleted. The Tables 3.3-12 and 4.3-8 are also deleted.

DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.3.7 ACTIONS, as shown in CTS Table 3.3-10, provide the compensatory actions to take when PAM instrumentation is inoperable. ITS 3.3.3 ACTIONS provide the compensatory actions for inoperable PAM Instrumentation. The ITS 3.3.3 ACTIONS include a Note that allows separate Condition entry for each Function. In addition, separate Condition entry is allowed within a Function on a "per" bases as listed for Functions 8 (Steam Line Pressure (per steam line)), 10 (Steam Generator Level (Narrow Range) (per steam generator)) 11 (Auxiliary Feedwater (per steam generator)), and 19 (Containment Isolation Valve Position (per penetration flowpath)). This modifies the CTS by providing a specific allowance to enter the Action for each inoperable PAM instrumentation Function and for certain Functions on a "per" steam line, steam generator, or penetration flowpath basis.

This change is acceptable because it clearly states the current requirement. The CTS considers each PAM instrumentation Function to be separate and independent from the others. In addition, the channels associated with Functions 8, 10, 11, and 19 are allowed separate Condition entry on a steam line, steam generator, or penetration flowpath basis, which is consistent with the intent of the CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS Table 3.3-10 Instrument 11.b (Auxiliary Feedwater (Valve Position Indication)) "Minimum Channels Required" column states that the minimum channels required is 3/steam generator. ITS Table 3.3.3-1 Function 11.b (Auxiliary Feedwater (Valve Position Indication)) "Required Channels" column requires one channel per steam generator (consisting of 3 valve position indications). This changes the CTS by simplifying the presentation of the requirements for Auxiliary Feedwater (Valve Position Indication) instrumentation by requiring one channel per steam generator.

The purpose of CTS Table 3.3-10 "Minimum Channels Required" column is to list the number of channels required to be OPERABLE for the associated instrument per steam generator. CTS Table 3.3-10 "Minimum Required Channels" column lists "3/steam generator" as the minimum required channels for Instrument 11.b (Auxiliary Feedwater (Valve Position Indication)). At SQN a channel consists of three valves per steam generator, two from the motor driven auxiliary feedwater pump and one from the turbine driven auxiliary feedwater pump. Therefore, to fulfill the "Minimum Required Channels" requirement for Instrument 11.b requiring one channel per steam generator, all three valves position indication must be OPERABLE. This change is acceptable because the requirements contained in ITS are the same as in CTS when a required auxiliary feedwater valve position indicator is inoperable. This change is designated as administrative because it does not result in technical changes to the CTS.

A04 CTS Table 3.3-10 Instrument 14 (Incore Thermocouples) "Minimum Channels Required" column states, in part, that the minimum channels required is 2 (1 per train) in each of the four core quadrants. ITS Table 3.3.3-1 Function 14 (Incore Thermocouples) "Required Channel" column also requires two channels in each of the four core quadrants and is modified by Footnote (c). ITS Table 3.3.3-1 Footnote (c) states, "A channel consists of one incore thermocouple. The required channels in each quadrant shall be in different trains." This changes the CTS by explicitly stating the number of incore thermocouples included in a channel.

The purpose of CTS Table 3.3-10 "Minimum Channels Required" column is to list the number of channels required to be OPERABLE for the associated instrument. CTS Table 3.3-10 "Minimum Required Channels" column lists "2(1/train)" as the minimum required channels for Instrument 14 (Incore Thermocouples) in each core quadrant. At SQN a channel consists of one incore thermocouple, therefore to fulfill the "Minimum Required Channels" requirement for Instrument 14 requires two incore thermocouples in each core quadrant, one from each train, to be OPERABLE. ITS Table 3.3.3-1 "Required Channel" column for Function 14 (Incore Thermocouples) requires two channels to be OPERABLE in each of the four core quadrants and is modified by Footnote (c). ITS Table 3.3.3-1 Footnote (c) states that a channel consists of one incore thermocouple from different trains. The addition of Footnote (c) explicitly states the channel requirement of CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 CTS Table 3.3-10 Instrument 18.a (ERCW to AFW Valve Position (Motor Driven Pumps)), "Minimum Channels Required" column states, in part, that the minimum channels required are 1/Train/Pump (2 Valves/Train). ITS Table 3.3.3-1 Function 18.a (ERCW to AFW Valve Position (Motor Driven Pumps)), "Required Channel" column requires 2 channels. CTS Table 3.3-10 Instrument 18.b (ERCW to AFW Valve Position (Turbine Driven Pump)), "Minimum Channels Required" column states that the minimum channels required are 2 Trains (2 Valves/Train). ITS Table 3.3.3-1 Function 18.b (ERCW to AFW Valve Position (Turbine Driven Pump)), "Required Channel" column requires 2 channels. This changes the CTS by simplifying the presentation of the channel requirements for ERCW to AFW Valve Position for the Motor Driven Pumps and the Turbine Driven Pump.

The purpose of CTS Table 3.3-10 "Minimum Channels Required" column is to designate the number of channels required to be OPERABLE for the associated instrument. CTS Table 3.3-10 "Minimum Required Channels" column lists "1/Train/Pump (2 Valves/Train)" as the minimum required channels for Instrument 18.a (ERCW to AFW Valve Position (Motor Driven Pumps,)). At SQN there are two motor driven auxiliary feedwater pumps. Each motor driven pump has two valves in series between the AFW pump and the ERCW supply. CTS Table 3.3-10 lists them as 3-116A and 3-116B, which are in the ERCW supply line to the 1A-A AFW Pump, and 3-126A and 3-126B, which are in the ERCW supply line to the 1B-B AFW pump. The ITS Bases defines a channel as consisting of these two valves in series in the ERCW to AFW flow path for each motor driven pump, therefore 2 channels are required. CTS Table 3.3-10 "Minimum Required Channels" column lists "2 Trains (2 Valves/Train)" as the minimum required channels for Instrument 18.b (ERCW to AFW Valve Position (Turbine Driven Pump,)). At SQN there is one turbine driven auxiliary feedwater pump. The turbine driven pump has two supply lines from ERCW, one from each train with two valves in series between the AFW pump and the ERCW supply. CTS Table 3.3-10 lists them as 3-136A and 3-136B, which are in the ERCW supply line from the 1A ERCW header to the turbine driven AFW Pump, and 3-179A and 3-179B, which are in the ERCW supply line from the 1B ERCW header to the turbine driven AFW pump. The ITS Bases defines a channel as two valves in series for each ERCW supply line to the turbine driven AFW pump, therefore 2 channels are required. This change is acceptable because the requirements contained in ITS are the same as in CTS when an ERCW to AFW Valve Position channel is inoperable. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 CTS Table 3.3-10 Instrument 19 (Containment Isolation Valve Position) "Minimum Channels Required" column requires one valve position indication channel OPERABLE per valve and lists ACTION 3 as the ACTION to follow if one channel per valve is inoperable. CTS Table 3.3-10 ACTION 3.a provides the required ACTIONS for one of the penetration inboard or outboard valve(s) inoperable (i.e., one channel inoperable per penetration) one part of which is restoring the inoperable valve(s) accident indication to OPERABLE status within 30 days. CTS Table 3.3-10 ACTION 3.b provides the required ACTIONS for both an inboard and outboard valve(s) on the same penetration inoperable (i.e., two channels inoperable per penetration) one part of which is restoring at least the inboard or outboard inoperable valve(s) indication to OPERABLE status within 7 days. ITS LCO 3.3.3 ACTION A, applicable to Function 19 (Containment Isolation Valve Position), states that with one or more Functions with one required channel inoperable restore required channel to OPERABLE status within 30 days. ITS LCO 3.3.3 ACTION C, applicable to Function 19 (Containment Isolation Valve Position), states that with one or more Functions with two required channels inoperable to restore one channel to OPERABLE status within 7 days. CTS Table 3.3-10 Note ### states, in part, that on a penetration where accident indication is declared inoperable on a valve but on the opposite side of the penetration an accident indication valve does not exist (such as with a closed system or a check valve), only ACTION 3(a) must be entered. ITS Table 3.3.3-1 Function 19 (Containment Isolation Valve Position) "Required Channels" column requires two channels to be OPERABLE per penetration and is modified by Footnote (b) which states that only one position indication channel is required for penetration flow paths with only one installed control room indication channel. CTS Table 3.3-10 ACTION 3.a references an inboard or outboard valve. CTS Table 3.3-10 ACTION 3.b references both an inboard and outboard valve(s). CTS Table 3.3-10 Note ###, in part, references penetrations whose valves are either both inboard (FCV 63-158 and FCV 63-172) or both outboard (FCV 30-46 and VLV 30-571, FCV 30-47 and VLV 30-572, FCV 30-48 and VLV 30-573) and states that if both valves (two) have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status. ITS LCO 3.3.3 ACTION C, applicable to Function 19 (Containment Isolation Valve Position), states that with one or more Functions with two required channels inoperable to restore one channel to OPERABLE status within 7 days, similar to CTS Table 3.3-10 ACTION 3.b. This changes the CTS by simplifying the presentation of the requirements for Containment Isolation Valve Position instrumentation by requiring two channels per penetration, except where ITS Table 3.3.3-1 Footnote (b) is applicable for those penetration flow paths with only one installed control room indication channel, and eliminating reference to inboard and outboard valve combinations.

The purpose of CTS Table 3.3-10 is to provide requirements for Post-Accident Monitoring instruments. One of these instruments is Containment Isolation Valve Position. CTS requires one position indication channel per valve to be OPERABLE where normally there are two valves per penetration. Similarly, ITS requires two channels per penetration. CTS Note ###, in part, states that on a penetration where accident indication is declared INOPERABLE on a valve but on the opposite side of the penetration an accident indication valve does not exist (such as with a closed system or a check valve), only ACTION 3(a) must be entered. ITS Table 3.3.3-1 Footnote (b) similarly states that only one position indication channel is required for penetration flow paths with only one installed control room indication channel. CTS Table 3.3-10 Note ###, in part, requires entry into ACTION 3.b when two required valve position indicators per penetration are inoperable because ACTION 3.b entry condition is when both an inboard and outboard valve(s) on the same penetration inoperable (i.e., two position indicator per penetration). ITS LCO 3.3.3 ACTION C condition entry is when one or more Functions have two required channels inoperable, similar to CTS. This change is acceptable because the requirements contained in ITS are the same as in CTS when Containment Isolation Valve Position channel are inoperable for penetrations with two isolation valves per penetration and penetrations with one isolation valve per penetration. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 CTS Table 3.3-10 ACTION 1, ACTION 2, ACTION 3, and ACTION 5 contain a Note referring to applicable action requirements from reference LCOs that may contain more restrictive actions. ITS Table 3.3.3-1 does not retain this information. This changes the CTS by not including the information referring to other potentially applicable action requirements to the Bases.

The purpose of CTS Table 3.3-10 ACTION 1, ACTION 2, ACTION 3, and ACTION 5 Note is to reference potentially associated Technical Specifications. It is an ITS convention to not include these types of notes or cross-references. This change is designated as administrative change because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.3.3.7.a requires performance of a CHANNEL CHECK every 31 days. CTS 4.3.3.7.b requires performance of a CHANNEL CALIBRATION every 18 months. ITS SR 3.3.3.1 (CHANNEL CHECK) and SR 3.3.3.2 (CHANNEL CALIBRATION) require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.3.3.7 b Footnote * states, for Containment Area Radiation Monitors, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10R/h and a single calibration check of the detector below 10R/h with either an installed or portable gamma source. ITS SR 3.3.3.2 Note 2 states, for Containment Area Radiation Monitors, radiation detectors are excluded from a CHANNEL CALIBRATION for decade ranges above 10R/hour. This changes the CTS by moving the type of calibration required "a single calibration check" below 10R/h and the type of source, "installed or portable gamma source," 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 for the OPERABLE Containment Area Radiation Monitors and ensures the Containment Area Radiation Monitors are capable of performing their safety function. 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 information relating to system design is being removed from the Technical Specifications.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-10 for Accident Monitoring Instrumentation has two columns stating various requirements for each instrument. These columns are labeled, "TOTAL NO. OF CHANNELS," and "MINIMUM CHANNELS REQUIRED." ITS Table 3.3.3-1 does not retain the "TOTAL NO. OF CHANNELS" column. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" column to the Bases.

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

LA04 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-10 Instruments 1 (Reactor Coolant T_{HOT} (Wide Range), 2 (Reactor Coolant T_{COLD} (Wide Range)), 9 (Steam Generator Level - (Wide Range)), 14 (Incore Thermocouples), 18.a (ERCW to AFW Valve Position (Motor Driven Pumps)), and 18.b (ERCW to AFW Valve Position (Turbine Driven Pumps)) "Minimum Channels Required" column contains information associated with the total number of channels required for each instrument along with the number of channels required on a per loop, per steam generator, per train or valves per train basis. ITS does not contain this information in the "Required Column" only the required number of channels per Function. This changes the CTS by moving the information associated with the number per loop, per steam generator totals, per train, or valves per train to the Bases.

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

LA05 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-10 contains information associated with the specific instrument loops associated with Instruments 1 (Reactor Coolant T_{HOT} (Wide Range), 2 (Reactor Coolant T_{COLD} (Wide Range)), 3 (Containment Pressure (Wide Range)), 4 (Containment Pressure (Narrow Range)), 5 (Refueling Water Storage Tank Level), 6 (Reactor Coolant Pressure (Wide Range)), 7 (Pressurizer Level (Wide Range)), 8 (Steam Line Pressure), 9 (Steam Generator Level - (Wide Range)), 10 (Steam Generator Level - (Narrow Range)), 11.a (Auxiliary Feedwater-Flow Rate), 11.b (Auxiliary Feedwater-Valve Position Indication), 12 (Reactor Coolant System Subcooling Margin Monitor), 13 (Containment Water Level (Wide Range)), 15.a (Reactor Vessel Level Instrumentation-Dynamic Range), 15.b (Reactor Vessel Level Instrumentation-Lower Range), 15.c (Reactor Vessel Level Instrumentation-Upper Range), 16.a (Containment Area Radiation Monitors-Upper Compartment), 16.b (Containment Area Radiation Monitors-Lower Compartment), 17.a (Neutron Flux-Source Range), 17.b (Neutron Flux-Intermediate Range), 18.a (ERCW to AFW Valve Position-Motor Driven Pumps), 18.b (ERCW to AFW Valve Position-Turbine Driven Pumps), and 19 (Containment Isolation Valve Position). ITS does not contain this specific instrument loop information. This changes the CTS by moving the instrument loop information associated with the required instruments to the ITS bases.

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

LA06 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-10 ACTION 3.a references an inboard or outboard valve. CTS Table 3.3-10 ACTION 3.b references both an inboard and outboard valve(s). CTS Table 3.3-10 Note ###, in part, references penetrations whose valves are either both inboard (FCV 63-158 and FCV 63-172) or both outboard

(FCV 30-46 and VLV 30-571, FCV 30-47 and VLV 30-572, FCV 30-48 and VLV 30-573) and states that if both valves (two) have inoperable accident indication, ACTION 3(b) must be entered until at least one of the valve's accident indication is restored to OPERABLE status. ITS does not contain this specific valve information. This changes the CTS by moving the valve information associated with the containment isolation valve position to the ITS bases.

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

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* Unit 1 CTS 3.3.3.7 ACTION requires actions be performed as required by CTS Table 3.3-10. CTS Table 3.3-10 ACTION 1.a, ACTION 2.a, ACTION 3.a, and ACTION 5.a require the plant be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours if an inoperable channel cannot be restored to OPERABLE status within 30 days when the number of OPERABLE channels is one less than the minimum channels required or when one or more steam generators have less than the minimum channels required for either flow rate or valve position. ITS 3.3.3 ACTION B, which is applicable when the required action and associated Completion Time of Condition A is not met, requires initiation of action in accordance with ITS Specification 5.6.5. ITS 3.3.3 Condition A is entered when one or more Functions have one required channel inoperable and requires returning the channel to an OPERABLE status within 30 days. Therefore, in ITS with one or more Functions with one inoperable channel for all Functions except Function 16, Condition B requires initiation of a report to the NRC in accordance with ITS 5.6.5 if one inoperable channel is not made OPERABLE within 30 days. This changes the CTS by deleting the requirements for the unit to be in HOT STANDBY or HOT SHUTDOWN with one of the required channels inoperable and not restored within the allowed outage time, and instead requiring a report to be made in accordance with ITS 5.6.5.

The purpose of these shutdown requirements is to limit unit operation in the MODES of Applicability when required equipment is inoperable. 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 for monitoring. The 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 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.3.3.7.b requires that each accident monitoring instrument be demonstrated OPERABLE by performance of a CHANNEL CALIBRATION every 18 months. ITS 3.3.3.2 requires performance of a CHANNEL CALIBRATION also but is modified by a Note stating, "Neutron detectors are excluded from CHANNEL CALIBRATION." This changes the CTS by excluding Neutron detectors from the Source and Intermediate Range CHANNEL CALIBRATIONS.

The purpose of a CHANNEL CALIBRATION is to ensure that the channel responds within the necessary range and accuracy to known values of the parameter that the channel monitors. Thus, to perform a channel calibration of a neutron flux channel would require including the neutron flux detector in the calibration. Inclusion of neutron flux detectors in the CHANNEL CALIBRATION process is impractical in power reactor applications because to do so would require subjecting the detectors to known neutron fluxes. Because of the hazards associated with exposing the neutron detectors, CTS Table 4.3-1 Note (6) excludes these detectors from CHANNEL CALIBRATION. The detectors excluded from CHANNEL CALIBRATION in CTS Table 4.3-1 are the same channels used to satisfy CTS Table 3.3-10. This proposed change is consistent with historical and current NRC staff requirements as reflected in ISTS. Explicitly stating the neutron detectors are excluded from CHANNEL CALIBRATION reiterates the allowance found in CTS Table 4.3-1. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L03 *(Category 1 – Relaxation of LCO Requirements)* CTS Table 3.3-10 Note ## is associated with Instrument 19 (Containment Isolation Valve Position) Minimum Required Channels and states, "Not required for isolation valves that are closed and deactivated." ITS includes a similar Footnote for Function 19 (Containment Isolation Valve Position) that states, "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." This changes the CTS by reducing the conditions under which the isolation valves indication must be OPERABLE by including exceptions of when the penetration is isolated by a closed manual valve, blind flange, or check valve with flow through the valve secured.

The purpose of CTS Table 3.3-10, Instrument 19 (Containment Isolation Valve Position) is for verification of containment isolation using the ability to monitor containment penetration isolation valve status through valve position indication. A closed and deactivated isolation valve provides evidence that the penetration is isolated and the requirement to provide indication of the valve position is no longer necessary. Similarly by isolating the penetration using a manual valve, blind flange, or check valve with the flow through it secured provides evidence that the penetration is isolated and the requirement to provide indication of the

DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

valve position is no longer necessary. This change is designated as less restrictive because the containment isolation position indication channels are required to be OPERABLE under fewer conditions in ITS than were required in CTS.

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

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

3.3.3.7 LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

--NOTE--

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 1.a ACTION 2.a ACTION 3.a ACTION 5.a	INSERT 1 A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	①
DOC L01	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.5.	Immediately	
ACTION 1.b ACTION 2.b ACTION 3.b	C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days	
	INSERT 2			①
ACTION 1.b ACTION 2.b ACTION 2.c ACTION 3.a ACTION 3.b ACTION 4 ACTION 5.b	G ~~D~~. Required Action and associated Completion Time of ~~Condition C~~ Conditions C, D, E, or F not met.	G ~~D~~.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately	① ①

① **INSERT 1**

ACTION 4

------------------------------NOTE-----------------------------
Not applicable to Function 16.
----

① **INSERT 2**

Table 3.3-10 Functions 6 and 7 Action 2 ACTION 2.c	------------NOTE---------- Only applicable to Functions 6 and 7. ----------------------------- D. One or more Functions with three required channels inoperable.	D.1 Restore one channel to OPERABLE status.	48 hours
ACTION 5.b	E. One or more steam generators with one Auxiliary Feedwater (AFW) flow rate channel and one AFW valve position indication channel on the same steam generator inoperable.	E.1 Restore one channel to OPERABLE status.	7 days
ACTION 4	F. One or more Containment Area Radiation Monitors with one required channel inoperable.	F.1 Initiate an alternate method of monitoring containment area radiation. <u>AND</u> F.2 Restore the inoperable channel(s) to OPERABLE status.	72 hours 30 days

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 1.b ACTION 2,b ACTION 2.c ACTION 3.b ACTION 5.b	H ~~E~~. As required by Required Action ~~D~~ G.1 and referenced in Table 3.3.3-1.	H ~~E~~.1 Be in MODE 3. AND H ~~E~~.2 Be in MODE 4.	6 hours 12 hours	① ①
ACTION 4	I ~~F~~. As required by Required Action ~~D~~ G.1 and referenced in Table 3.3.3-1.	I ~~F~~.1 Initiate action in accordance with Specification 5.6.5.	Immediately	①

SURVEILLANCE REQUIREMENTS

---NOTE---

4.3.3.7 These SRs ~~SR 3.3.3.1 and SR 3.3.3.2~~ apply to each PAM instrumentation Function in Table 3.3.3-1. ①

	SURVEILLANCE		FREQUENCY	
4.3.3.7.a	SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

SURVEILLANCE REQUIREMENTS (continued)

4.3.3.7.b

DOC L02

SURVEILLANCE		FREQUENCY
SR 3.3.3.2	-------------------------------NOTES------------------------------- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. ① ① INSERT 3 --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ②

①

INSERT 3

4.3.3.7.b
Note *

2. For Containment Area Radiation Monitors, radiation detectors are excluded from a CHANNEL CALIBRATION for decade ranges above 10 R/hr.

Table 3.3-10

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION ~~D~~ G.1 ①
~~1. Power Range Neutron Flux~~	~~2~~	~~E~~
INSERT 4		
~~2. Source Range Neutron Flux~~	~~2~~	~~E~~
~~3. Reactor Coolant System (RCS) Hot Leg Temperature~~	~~2 per loop~~	~~E~~
~~4. RCS Cold Leg Temperature~~	~~2 per loop~~	~~E~~
~~5. RCS Pressure (Wide Range)~~	~~2~~	~~E~~
~~6. Reactor Vessel Water Level~~	~~2~~	~~F~~
~~7. Containment Sump Water Level (Wide Range)~~	~~2~~	~~E~~
~~8. Containment Pressure (Wide Range)~~	~~2~~	~~E~~
~~9. Penetration Flow Path Containment Isolation Valve Position~~	~~2 per penetration flow path$^{(a)(b)}$~~	~~E~~
~~10. Containment Area Radiation (High Range)~~	~~2~~	~~F~~
~~11. Pressurizer Level~~	~~2~~	~~E~~
~~12. Steam Generator Water Level (Wide Range)~~	~~2 per steam generator~~	~~E~~
~~13. Condensate Storage Tank Level~~	~~2~~	~~E~~
~~14. Core Exit Temperature - Quadrant [1]~~	~~2$^{(c)}$~~	~~E~~
~~15. Core Exit Temperature - Quadrant [2]~~	~~2$^{(c)}$~~	~~E~~
~~16. Core Exit Temperature - Quadrant [3]~~	~~2$^{(c)}$~~	~~E~~
~~17. Core Exit Temperature - Quadrant [4]~~	~~2$^{(c)}$~~	~~E~~
~~18. Auxiliary Feedwater Flow~~	~~2~~	~~E~~

①

Note ##
ACTION 3.a
ACTION 3.b

(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.

Note ###

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

DOC A03

(c) A channel consists of ~~two~~ one incore ~~core exit~~ thermocouple~~s~~ ~~(CETs)~~. The required channels in each quadrant shall be in different trains. ①

~~-----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.~~
~~-----~~ ③

Note #

(d) Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint. ①

Table 3.3-10

①

INSERT 4

		FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION G.1
1	1.	Reactor Coolant T_{HOT} (Wide Range)	4	H
2	2.	Reactor Coolant T_{COLD} (Wide Range)	4	H
3	3.	Containment Pressure (Wide Range)	2	H
4	4.	Containment Pressure (Narrow Range)	2	H
5	5.	Refueling Water Storage Tank Level	2	H
6	6.	Reactor Coolant Pressure (Wide Range)	3	H
7	7.	Pressurizer Level (Wide Range)	3	H
8	8.	Steam Line Pressure	2 per steam line	H
9	9.	Steam Generator Level - (Wide Range)	4	H
10	10.	Steam Generator Level - (Narrow Range)	2 per steam generator	H
11	11.	Auxiliary Feedwater		
		a. Flow Rate	1 per steam generator	H
		b. Valve Position Indication	1 per steam generator	H

①

Table 3.3-10

INSERT 4 continued

CTS	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION G.1
12	12. Reactor Coolant System Subcooling Margin Monitor	2	H
13	13. Containment Water Level (Wide Range)	2	H
14	14. Incore Thermocouples		
	a. Core Quadrant (1)	$2^{(c)}$	H
	b. Core Quadrant (2)	$2^{(c)}$	H
	c. Core Quadrant (3)	$2^{(c)}$	H
	d. Core Quadrant (4)	$2^{(c)}$	H
15	15. Reactor Vessel Level Instrumentation		
	a. Dynamic Range	2	H
	b. Lower Range	2	H
	c. Upper Range	2	H
16	16. Containment Area Radiation Monitors		
	a. Upper Compartment	1	I
	b. Lower Compartment	1	I
17	17. Neutron Flux		
	a. Source Range	$2^{(d)}$	H
	b. Intermediate Range	2	H
18	18. ERCW to AFW Valve Position		
	a. Motor Driven Pumps	2	H
	b. Turbine Driven Pump	2	H
19	19. Containment Isolation Valve Position	2 per penetration flowpath$^{(a)(b)}$	H

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

3.3.3.7 LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

--NOTE--

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION 1.a ACTION 2.a ACTION 3.a ACTION 5.a	INSERT 1 A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	①
DOC L01	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.5.	Immediately	
ACTION 1.b ACTION 2.b ACTION 3.b	C. One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days	
	INSERT 2			①
ACTION 1.b ACTION 2.b ACTION 2.c ACTION 3.a ACTION 3.b ACTION 4 ACTION 5.b	G ~~D~~. Required Action and associated Completion Time of ~~Condition C~~ not met. Conditions C, D, E, or F	G ~~D~~.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately	① ①

① INSERT 1

ACTION 4

------------------------------NOTE-----------------------------
Not applicable to Function 16.
----

① INSERT 2

Table 3.3-10 Functions 6 and 7 Action 2 ACTION 2.c	------------NOTE---------- Only applicable to Functions 6 and 7. ---------------------------- D. One or more Functions with three required channels inoperable.	D.1 Restore one channel to OPERABLE status.	48 hours
ACTION 5.b	E. One or more steam generators with one Auxiliary Feedwater (AFW) flow rate channel and one AFW valve position indication channel on the same steam generator inoperable.	E.1 Restore one channel to OPERABLE status.	7 days
ACTION 4	F. One or more Containment Area Radiation Monitors with one required channel inoperable.	F.1 Initiate an alternate method of monitoring containment area radiation. <u>AND</u> F.2 Restore the inoperable channel(s) to OPERABLE status.	72 hours 30 days

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
ACTION 1.b ACTION 2,b ACTION 2.c ACTION 3.b ACTION 5.b	H ~~E~~. As required by Required Action ~~D~~.1 and referenced in Table 3.3.3-1. G	H ~~E~~.1	Be in MODE 3.	6 hours	①
		AND			
		H ~~E~~.2	Be in MODE 4.	12 hours	①
ACTION 4	I ~~F~~. As required by Required Action ~~D~~.1 and referenced in Table 3.3.3-1. G	I ~~F~~.1	Initiate action in accordance with Specification 5.6.5.	Immediately	①

SURVEILLANCE REQUIREMENTS

---NOTE---

4.3.3.7 These SRs ~~SR 3.3.3.1 and SR 3.3.3.2~~ apply to each PAM instrumentation Function in Table 3.3.3-1. ①

	SURVEILLANCE		FREQUENCY	
4.3.3.7.a	SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	②

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
4.3.3.7.b DOC L02	SR 3.3.3.2 ------------------NOTE------------------ S 1. Neutron detectors are excluded from CHANNEL CALIBRATION. INSERT 3 ------------------------------------	① ①
	Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ②

① INSERT 3

4.3.3.7.b Note *

2. For Containment Area Radiation Monitors, radiation detectors are excluded from a CHANNEL CALIBRATION for decade ranges above 10 R/hr.

Table 3.3-10

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

①

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION ~~D~~ G.1
INSERT 4		
~~1. Power Range Neutron Flux~~	~~2~~	~~E~~
~~2. Source Range Neutron Flux~~	~~2~~	~~E~~
~~3. Reactor Coolant System (RCS) Hot Leg Temperature~~	~~2 per loop~~	~~E~~
~~4. RCS Cold Leg Temperature~~	~~2 per loop~~	~~E~~
~~5. RCS Pressure (Wide Range)~~	~~2~~	~~E~~
~~6. Reactor Vessel Water Level~~	~~2~~	~~F~~
~~7. Containment Sump Water Level (Wide Range)~~	~~2~~	~~E~~
~~8. Containment Pressure (Wide Range)~~	~~2~~	~~E~~
~~9. Penetration Flow Path Containment Isolation Valve Position~~	~~2 per penetration flow path$^{(a)(b)}$~~	~~E~~
~~10. Containment Area Radiation (High Range)~~	~~2~~	~~F~~
~~11. Pressurizer Level~~	~~2~~	~~E~~
~~12. Steam Generator Water Level (Wide Range)~~	~~2 per steam generator~~	~~E~~
~~13. Condensate Storage Tank Level~~	~~2~~	~~E~~
~~14. Core Exit Temperature - Quadrant [1]~~	2~~$^{(c)}$~~	~~E~~
~~15. Core Exit Temperature - Quadrant [2]~~	2~~$^{(c)}$~~	~~E~~
~~16. Core Exit Temperature - Quadrant [3]~~	2~~$^{(c)}$~~	~~E~~
~~17. Core Exit Temperature - Quadrant [4]~~	2~~$^{(c)}$~~	~~E~~
~~18. Auxiliary Feedwater Flow~~	~~2~~	~~E~~

①

Note ##
ACTION 3.a
ACTION 3.b

(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.

Note ###

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

DOC A03

(c) A channel consists of ~~two core exit~~ one incore thermocouple~~s (CETs)~~. The required channels in each quadrant shall be in different trains.

①

~~-----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.~~
~~-----~~

③

Note #

(d) Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

①

①

Table 3.3-10

①

INSERT 4

CTS		FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION G.1
1	1.	Reactor Coolant T_{HOT} (Wide Range)	4	H
2	2.	Reactor Coolant T_{COLD} (Wide Range)	4	H
3	3.	Containment Pressure (Wide Range)	2	H
4	4.	Containment Pressure (Narrow Range)	2	H
5	5.	Refueling Water Storage Tank Level	2	H
6	6.	Reactor Coolant Pressure (Wide Range)	3	H
7	7.	Pressurizer Level (Wide Range)	3	H
8	8.	Steam Line Pressure	2 per steam line	H
9	9.	Steam Generator Level - (Wide Range)	4	H
10	10.	Steam Generator Level - (Narrow Range)	2 per steam generator	H
11	11.	Auxiliary Feedwater		
		a. Flow Rate	1 per steam generator	H
		b. Valve Position Indication	1 per steam generator	H

Table 3.3-10

①

INSERT 4 continued

CTS		FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION G.1
12	12.	Reactor Coolant System Subcooling Margin Monitor	2	H
13	13.	Containment Water Level (Wide Range)	2	H
14	14.	Incore Thermocouples		
		a. Core Quadrant (1)	$2^{(c)}$	H
		b. Core Quadrant (2)	$2^{(c)}$	H
		c. Core Quadrant (3)	$2^{(c)}$	H
		d. Core Quadrant (4)	$2^{(c)}$	H
15	15.	Reactor Vessel Level Instrumentation		
		a. Dynamic Range	2	H
		b. Lower Range	2	H
		c. Upper Range	2	H
16	16.	Containment Area Radiation Monitors		
		a. Upper Compartment	1	I
		b. Lower Compartment	1	I
17	17.	Neutron Flux		
		a. Source Range	$2^{(d)}$	H
		b. Intermediate Range	2	H
18	18.	ERCW to AFW Valve Position		
		a. Motor Driven Pumps	2	H
		b. Turbine Driven Pump	2	H
19	19.	Containment Isolation Valve Position	2 per penetration flowpath$^{(a)(b)}$	H

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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

2. ISTS SR 3.3.3.1 and ISTS SR 3.3.3.2 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.3.3.1 and SR 3.3.3.2 is "In accordance with the Surveillance Frequency Control Program."

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

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 1 ~~I~~ variables. ②

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.~~ ①

Category 1 ~~I~~ variables are the key variables deemed risk significant because they are needed to: ②

- Permit the operator to take preplanned manual actions to accomplish safe plant shutdown. ①
- Determine whether other systems important to safety are performing their intended functions,
- Monitor the process of accomplishing or maintaining critical safety functions, and ①
- Provide information to the operators that will enable them to determine the likelihood of a gross breach of the barriers to radioactivity release ~~, and~~ and to determine if a gross breach of a barrier has occurred. ①

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~~. ①

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~~ 1 variables and provide justification for deviating from the NRC proposed list of Category ~~I~~ 1 variables. ②

~~-----------------------------------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).~~
~~--~~ ③

The specific instrument Functions listed in Table 3.3.3-1 are discussed in the LCO section.

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the operability of Regulatory Guide 1.97 Type A and Category ~~I~~ 1 variables so that the control room operating staff can: 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),~~ ①
- 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,
- Determine whether systems important to safety are performing their intended functions,
- Monitor the process of accomplishing or maintaining critical safety functions, ①
- Determine the likelihood of a gross breach of the barriers to radioactivity release, and ④
- Determine if a gross breach of a barrier has occurred~~, and~~ ④

BASES

APPLICABLE SAFETY ANALYSES (continued)

- ~~Initiate action necessary to protect the public and to estimate the magnitude of any impending threat~~. ①

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 1~~I~~, ② non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category 1~~I~~, non-Type A, variables are important for reducing ② public risk.

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 1~~I~~, ② 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 2~~1~~. 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.

The exception to the two channel requirement is ~~Penetration Flow Path~~ ⑤ 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

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. ② ②

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

~~1, 2. Power Range and Source Range Neutron Flux~~

~~Power Range and Source Range Neutron Flux indication is provided to verify reactor shutdown. The two ranges are necessary to cover 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.~~

1, 2. ~~3, 4.~~ Reactor Coolant ~~System (RCS)~~ T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) ~~Hot and Cold Leg~~ Temperatures

~~RCS Hot and Cold Leg Temperatures~~ Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) are Category ~~I~~ 1 variables provided for verification of core cooling and long term surveillance. ②

~~RCS hot and cold leg~~ Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} temperatures are used to determine ~~RCS~~ reactor coolant subcooling margin. ~~RCS~~ Reactor coolant subcooling margin will allow termination of safety injection (SI), if still in progress, or reinitiation of SI if it has been stopped. ~~RCS~~ Reactor coolant subcooling margin is also used for unit stabilization and cooldown control.

BASES

LCO (continued)

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.

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~~°F to 700°F.

0

INSERT 1 ①

~~5. Reactor Coolant System Pressure (Wide Range)~~

~~RCS wide range pressure is a Category I variable provided for verification of core cooling and RCS integrity long term surveillance.~~

~~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).~~

~~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:~~

①

- ~~to determine whether to terminate actuated SI or to reinitiate stopped SI,~~
- ~~to determine when to reset SI and shut off low head SI,~~
- ~~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.~~

① INSERT 1

1, 2. continued

There are a total of four Reactor Coolant System (RCS) Hot and Cold Leg Temperature channels each. One RCS Hot leg temperature channel per loop and one Cold Leg temperature channel per loop. The instrument loops associated with RCS T_{HOT} are 68-001, -024, -043, and -065. The instrument loops associated with RCS T_{COLD} are 68-018, 68-041, 68-060, and 68-083.

3. Containment Pressure (Wide Range)

Containment Pressure (Wide Range) is provided for determination of potential for containment breach.

The channels provide indication over a range of -5 to 60 psig. There are a total of two Containment Pressure (Wide Range) channels. The instrument loops associated with Containment Pressure (Wide Range) are 30-310 and 30-311.

4. Containment Pressure (Narrow Range)

Containment Pressure (Narrow Range) is provided for determination of an actual containment breach and if a break is inside or outside containment. Additionally it is provided to monitor containment conditions following a break inside containment and verifying the accident is properly controlled.

The channels provide indication over a range of -1 to 15 psig. There are a total of two Containment Pressure (Narrow Range) channels. The instrument loops associated with Containment Pressure (Narrow Range) 30-044 and 30-045.

5. Refueling Water Storage Tank Level

Refueling Water Storage Tank Level is provided to verify a water source to emergency core cooling systems and containment spray system, determine the time for initiation of cold leg recirculation following a loss of coolant accident, and for event diagnosis.

The channels provide indication over a range of 0% to 100%. There are a total of two Refueling Water Storage Tank Level channels. The instrument loops associated with Refueling Water Storage Tank Level are 63-050 and 63-051.

①

INSERT 1 continued

6. Reactor Coolant Pressure (Wide Range)

Reactor Coolant Pressure (Wide Range) is provided to determine if the plant is in safe shutdown condition. It is also used for maintaining the proper relationship between RCS pressure and temperature, verifying vessel nondestructive testing criteria, maintain primary inventory subcooled (particularly with loss of offsite power), establish correct conditions for residual heat removal operation, determine whether reactor coolant pump operation should be continued, and determine whether high-head SI should be terminated or reinitiated.

The channels provide indication over a range of 0 to 3000 psig. There are a total of three Reactor Coolant Pressure (Wide Range) channels. The instrument loops associated with Reactor Coolant Pressure (Wide Range) are 68-062, 68-066, and 68-069.

7. Pressurizer Level (Wide Range)

Pressurizer Level (Wide Range) is provided to confirm if plant is in a safe shutdown condition. It is also provided to monitor RCS inventory, maintain pressurizer water level, and determine whether SI should be terminated or reinitiated.

The channels provide indication over a range of 0% to 100%. There are a total of three Pressurizer Level (Wide Range) channels. The instrument loops associated with Pressurizer Level (Wide Range) are 68-320, 68-335, and 68-339.

8. Steam Line Pressure

Steam Line Pressure is provided to determine if a high-energy secondary line rupture occurred. It is also provided to maintain an adequate reactor heat sink and verify auxiliary feedwater to steam generator associated with pipe rupture is isolated. It can be used to monitor secondary side pressure to: (1) verify operation of pressure control steam dump system, (2) maintain plant in safe shutdown condition, and (3) monitor RCS cooldown rate. It is diverse to T_{cold} for natural circulation determination. In addition, it can be used for identification of steam generator tube rupture and determination that faulted steam generator is isolated.

The channels provide indication over a range of 0 to 1200 psig. There are a total of eight Steam Line Pressure channels, two per loop. The instrument loops associated with Steam Line Pressure are 1-002A, 1-002B, 1-009A, 1-009B, 1-020A, 1-020B, 1-027A, and 1-027B

①

INSERT 1 continued

9. Steam Generator Level - (Wide Range)

Steam Generator Level (Wide Range) is provided to determine if heat sink is being maintained and is used for SI termination for secondary break outside containment.

The channels provide indication over a range of 0 to 100 percent. There are a total of four Steam Generator Level - (Wide Range) channels, one per steam generator. The instrument loops associated with Steam Generator Level - (Wide Range) are 3-043, 3-056, 3-098, and 3-111.

10. Steam Generator Level - (Narrow Range)

Steam Generator Level (Narrow Range) is provided to monitor heat sink, maintain steam generator water level, determine whether SI should be terminated, and determine which loop has SG tube rupture.

The channels provide indication over a range of 0 to 100 percent. There are a total of eight Steam Generator Level - (Narrow Range) channels, two per steam generator. The instrument loops associated with Steam Generator Level - (Narrow Range) are 3-039, 3-042, 3-052, 3-055, 3-094, 3-097, 3-107, and 3-110.

11. Auxiliary Feedwater

Auxiliary Feedwater (AFW) flow is provided to determine if sufficient flow exists to maintain heat sink and for SI termination. The channels provide indication over a range of 0 to 440 gpm. The redundant channel capability for AFW flow consists of a single AFW flow channel for each Steam Generator (four total, one per steam generator) with a diverse channel consisting of three AFW valve position indicators (two level control valves for the motor driven AFW flowpath and one level control valve for the turbine driven AFW flowpath) for each steam generator (12 total).

The instrument loops associated with AFW flow are 3-163, 3-155, 3-147, and 3-170. The instrument loops associated with AFW valve position indication are 3-164, 3-164A, 3-174, 3-156, 3-156A, 3-173, 3-148, 3-148A, 3-172, 3-171, 3-171A, and 3-175.

①

INSERT 1 continued

12. Reactor Coolant System Subcooling Margin Monitor

Reactor Coolant System Subcooling is provided for SI termination or reinitiation and maintenance of subcooling during depressurization.

The channels provide indication over a range of 200°F subcooled to 35°F superheat. There are a total of two Reactor Coolant System Subcooling Margin Monitor channels. The instrument loops associated with Reactor Coolant System Subcooling Margin Monitor are 94-101 and 94-102.

13. Containment Water Level (Wide Range)

Containment Water Level (Wide Range) is provided to verify water source for recirculation mode cooling, determine whether high energy line rupture has occurred inside or outside containment, and determine potential for containment breach caused by very high water levels.

The channels provide indication over a range of 0% to 100%. There are a total of two Containment Water Level (Wide Range) channels. The instrument loops associated with Containment Water Level (Wide Range) are 63-178 and 63-179.

14. Incore Thermocouples

Incore thermocouples are provided to verify that the core is being adequately cooled, verify that RCS remains subcooled, and for monitoring the potential for fuel clad breach.

The channels provide indication over a range of 200°F to 2300°F. There are a total of 65 Incore Thermocouples. Each channel consists of one incore thermocouple. The minimum number of channels required is two channels per quadrant, eight per core, one/core quadrant/train. The two required channels in each quadrant shall be in different trains.

①

INSERT 1 continued

15. Reactor Vessel Level Instrumentation

Reactor Vessel Level indication is provided for determination of core cooling. It is considered to be a more direct and less ambiguous indication of core cooling.

The channels provide indication over a range of 0% to 120% (dynamic range), 0% to 70% (lower range), and 64% to 120% (upper range). There are a total of six Reactor Vessel Level Instrument channels. The instrument loops associated with Reactor Vessel Level Dynamic Range are 68-367 and 68- 370. The instrument loops associated with Reactor Vessel Level Lower Range are 68-368 and 68-371. The instrument loops associated with Reactor Vessel Level Upper Range are 68-369 and 68-372.

16. Containment Area Radiation Monitors

Containment area radiation monitors are provided for accident diagnosis and SI Termination/Reinitiation.

The channels provide indication over a range of 10^0 to 10^8 R/hr. There are a total of four Containment Area Radiation Monitors. The instrument loops associated with Containment Area Radiation Monitors Upper Compartment are 90-271 and 90-272. The instrument loops associated with Containment Area Radiation Monitors Lower Compartment are 90-273 and 90-274.

17. Neutron Flux

The Intermediate Range and Source Range Neutron Flux are provided for monitoring reactivity control, determining if plant is subcritical, and to diagnose positive reactivity insertion.

The channels provide indication over a range of 1 to 10^6 CPS (Source Range) and 10^{-8} to 200% RTP (Intermediate Range). There are a total of two Source Range channels and two Intermediate Range channels. The instrument loops associated with the Source Range are 92-5001 and 92-5002. The instrument loops associated with the Intermediate Range are 92-5003 and 92-5004.

①

INSERT 1 continued

18. ERCW to AFW Valve Position

The ERCW to AFW valve position is provided for verification of heat sink availability. There is a total of four motor driven pump instrument loops. For the turbine driven AFW pump there is a total of four instrument loops. Each ERCW to AFW suction line contains two in-series isolation valves, each with its own position indication. Thus, position indication on both valves on a suction line is necessary. Each channel consists of the two valve position indications associated with the in-series valves in a single suction line.

The instrument loops associated with ERCW to AFW valve position for the Motor Driven Pumps are 3-116A, 3-116B, 3-126A, and 3-126B. The instrument loops associated with ERCW to AFW valve position for the Turbine Driven Pump are 3-136A, 3-136B, 3-179A, and 3-179B.

19. Containment Isolation Valve Position

Containment Isolation valve position is provided for verification of containment isolation. There is one position indication instrument per isolation valve. The Containment Isolation valve position indications are located on Panels TR-A XX-55-6K and TR-B XX-55-6L

BASES

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 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.~~

~~6. Reactor Vessel Water Level~~

~~Reactor Vessel Water Level is 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 System provides a direct measurement of the collapsed liquid level above the fuel alignment plate. The collapsed level represents the amount of liquid mass that is in the reactor vessel above the core. Measurement of the collapsed water level is selected because it is a direct indication of the water inventory.~~

~~7. Containment Sump Water Level (Wide Range)~~

~~Containment Sump Water Level is provided for verification and long term surveillance of RCS integrity.~~

~~Containment Sump Water Level is used to determine:~~

- ~~containment sump level accident diagnosis,~~

①

LCO (continued)

- ~~when to begin the recirculation procedure, and~~
- ~~whether to terminate SI, if still in progress.~~

~~8. Containment Pressure (Wide Range)~~

~~Containment Pressure (Wide Range) is provided for verification of RCS and containment OPERABILITY.~~

~~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 Position~~

~~Penetration Flow Path CIV Position is provided for verification of Containment OPERABILITY, and Phase A and Phase B isolation.~~

~~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.~~

①

BASES

LCO (continued)

~~10. Containment Area Radiation (High Range)~~

~~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.~~

~~11. Pressurizer Level~~

~~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.~~

~~12. Steam Generator Water Level (Wide Range)~~

~~SG Water Level is provided to monitor operation of decay heat removal via the SGs. The Category I indication of SG level is the 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.~~

~~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.~~

~~SG Water Level (Wide Range) is used to:~~

- ~~identify the faulted SG following a tube rupture,~~
- ~~verify that the intact SGs are an adequate heat sink for the reactor,~~
- ~~determine the nature of the accident in progress (e.g., verify an SGTR), and~~
- ~~verify unit conditions for termination of SI during secondary unit HELBs outside containment.~~

①

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 operator must manually raise and control SG level to 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~~

~~CST Level is provided to ensure water supply for auxiliary feedwater (AFW). The CST provides the ensured safety grade water supply for the AFW System. The CST consists of two identical tanks connected by a common outlet header. Inventory is monitored by a 0 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.~~

~~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 provided for verification and long term surveillance of core cooling.~~

~~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~~

①

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.~~

~~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.~~ ①

~~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~~

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.~~

①

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

A Note is added stating that this ACTION is not applicable to Function 16, which has its own ACTION for one channel inoperable.

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.

⑤

INSERT 2

①

INSERT 2

On a penetration where the position indication is declared inoperable on a valve but on the opposite side of the penetration a required containment isolation valve does not exist (such as with a closed system or a check valve), only Condition A must be entered. However, valves FCV-63-158 & -172 are both inboard penetration valves, but if both valves have inoperable position indication, Condition C must be entered until at least one of the valve's position indication is restored to OPERABLE status. Valves FCV-30-46 & VLV-30-571, FCV-30-47 & VLV-30-572, and FCV-30-48 & VLV-30-573 are all outboard penetration valves, but if both valves have inoperable position indication, Condition C must be entered until at least one of the valve's position indication is restored to OPERABLE status.

BASES

ACTIONS (continued)

B.1

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, which requires a written report to be submitted to the NRC immediately. This report discusses the results of 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

Condition C applies when one or more Functions have two inoperable required channels (i.e., two channels inoperable in the same Function). Required Action C.1 requires restoring one channel in the Function(s) to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

INSERT 3

~~D~~G.1

Condition ~~D~~ G applies when the Required Action and associated Completion Time of ~~Condition C is~~ Conditions C, D, E, or F are not met. Required Action ~~D~~G.1 requires entering the appropriate Condition referenced in Table 3.3.3-1 for the channel immediately. ⑤ The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met the Required Action of ~~Condition C~~ Condition C, D, E, or F, and the associated Completion Time has expired, Condition ~~D~~ G is entered for that channel and provides for transfer to the appropriate subsequent Condition. ⑤

⑤

INSERT 3

D.1

Condition D applies when one or more Functions have three required channels that are inoperable. A Note is included that states that this ACTION is only applicable to Functions 6 and 7. Required Action D.1 requires restoring one inoperable channel to OPERABLE status within 48 hours.

E.1

Condition E applies when one or more steam generators have one AFW flow rate channel and one AFW valve position channel on the same steam generator inoperable. Required Action E.1 requires restoring one inoperable channel to OPERABLE status within 7 days.

F.1 and F.2

Condition F applies when one or more Containment Area Radiation Monitors have one required channel inoperable. Required Action F.1 requires initiating an alternate method of monitoring containment area radiation within 72 hours. Required Action F.2 requires restoring the inoperable channel(s) to OPERABLE status within 30 days.

BASES

ACTIONS (continued)

~~E~~H.1 and ~~E~~H.2 ⑤

If the Required Action and associated Completion Time of Condition C, D, E, or F is not met and Table 3.3.3-1 directs entry into Condition ~~E~~H, 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. ⑤

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~~I.1 ⑤

~~At this unit,~~ Condition F requires initiation of alternate means of monitoring ~~Reactor Vessel Water Level and~~ Containment Area Radiation ~~have been developed and tested~~. ① 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.

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~~2 apply to each PAM instrumentation Function in Table 3.3.3-1. ⑤

SR 3.3.3.1

Performance of the CHANNEL CHECK 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.

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.~~ ⑥

~~OR~~

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

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

SR 3.3.3.2

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 is modified by two Notes. The first ~~a~~ Note ~~that~~ excludes neutron detectors. The calibration ⑤ method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." INSERT 4 Whenever a sensing ① element is replaced, the next required CHANNEL CALIBRATION of the Incore ~~Core Exit~~ thermocouple sensors is accomplished by an inplace cross ⑤ calibration that compares the other sensing elements with the recently installed sensing element. ~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~ ⑥

①

INSERT 4

The second Note excludes the Containment Area Radiation Monitors detectors from a CHANNEL CALIBRATION for decade ranges above 10R/h. A CHANNEL CALIBRATION for the Containment Area Radiation Monitors detectors for decade ranges below 10R/h is performed by a single calibration check with either an installed or portable gamma source.

BASES

SURVEILLANCE REQUIREMENTS (continued)

⑥

~~OR~~

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

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

③

REFERENCES

~~[~~ 1. ~~Unit specific document (e.g., FSAR, NRC Regulatory Guide 1.97 SER letter)~~. ~~]~~

2. Regulatory Guide 1.97, ~~[date]~~.

Revision 2, December 1980

3. NUREG-0737, Supplement 1, "TMI Action Items."

SQN-EEB-PS-PAM-0001, PAM Variable QA Data - Base

①

SEQUOYAH UNIT 1

Revision XXX

①

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 1 ~~I~~ variables. ②

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.~~ ①

Category 1 ~~I~~ variables are the key variables deemed risk significant because they are needed to: ②

- Permit the operator to take preplanned manual actions to accomplish safe plant shutdown. ①
- Determine whether other systems important to safety are performing their intended functions,
- Monitor the process of accomplishing or maintaining critical safety functions, and ①
- Provide information to the operators that will enable them to determine the likelihood of a gross breach of the barriers to radioactivity release~~, and~~ and to determine if a gross breach of a barrier has occurred. ①

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~~. ①

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 1 ~~I~~ variables and provide justification for deviating from the NRC proposed list of Category 1 ~~I~~ variables. ②

~~---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).~~
~~---~~ ③

The specific instrument Functions listed in Table 3.3.3-1 are discussed in the LCO section.

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the operability of Regulatory Guide 1.97 Type A and Category 1 ~~I~~ variables so that the control room operating staff can: 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),~~ ①
- 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,
- Determine whether systems important to safety are performing their intended functions,
- Monitor the process of accomplishing or maintaining critical safety functions, ①
- Determine the likelihood of a gross breach of the barriers to radioactivity release, and ④
- Determine if a gross breach of a barrier has occurred~~, and~~ ④

BASES

APPLICABLE SAFETY ANALYSES (continued)

- ~~Initiate action necessary to protect the public and to estimate the magnitude of any impending threat~~. ①

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 1 ~~I~~, non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category 1 ~~I~~, non-Type A, variables are important for reducing public risk. ② ②

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 1 ~~I~~, non-Type A. ②

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 2 ~~1~~. 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.

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 ⑤

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

1

Type A and Category ~~I~~ variables are required to meet Regulatory Guide 1.97 Category ~~I~~ (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. ② ②

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 Range Neutron Flux~~

~~Power Range and Source Range Neutron Flux indication is provided to verify reactor shutdown. The two ranges are necessary to cover 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.~~ ①

1, 2.

T_{HOT} and Reactor Coolant T_{COLD} (Wide Range)

~~3, 4.~~ Reactor Coolant ~~System (RCS) Hot and Cold Leg Temperatures~~

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} (Wide Range)

1

~~RCS Hot and Cold Leg Temperatures~~ are Category ~~I~~ variables provided for verification of core cooling and long term surveillance. ②

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD}

reactor coolant

~~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.

Reactor coolant

BASES

LCO (continued)

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.

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~~ 0 °F to 700°F.

①

INSERT 1

~~5. Reactor Coolant System Pressure (Wide Range)~~

~~RCS wide range pressure is a Category I variable provided for verification of core cooling and RCS integrity long term surveillance.~~

~~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).~~

~~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,~~
- ~~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.~~

①

① **INSERT 1**

1, 2. continued

There are a total of four Reactor Coolant System (RCS) Hot and Cold Leg Temperature channels each. One RCS Hot leg temperature channel per loop and one Cold Leg temperature channel per loop. The instrument loops associated with RCS T_{HOT} are 68-001, -024, -043, and -065. The instrument loops associated with RCS T_{COLD} are 68-018, 68-041, 68-060, and 68-083.

3. Containment Pressure (Wide Range)

Containment Pressure (Wide Range) is provided for determination of potential for containment breach.

The channels provide indication over a range of -5 to 60 psig. There are a total of two Containment Pressure (Wide Range) channels. The instrument loops associated with Containment Pressure (Wide Range) are 30-310 and 30-311.

4. Containment Pressure (Narrow Range)

Containment Pressure (Narrow Range) is provided for determination of an actual containment breach and if a break is inside or outside containment. Additionally it is provided to monitor containment conditions following a break inside containment and verifying the accident is properly controlled.

The channels provide indication over a range of -1 to 15 psig. There are a total of two Containment Pressure (Narrow Range) channels. The instrument loops associated with Containment Pressure (Narrow Range) 30-044 and 30-045.

5. Refueling Water Storage Tank Level

Refueling Water Storage Tank Level is provided to verify a water source to emergency core cooling systems and containment spray system, determine the time for initiation of cold leg recirculation following a loss of coolant accident, and for event diagnosis.

The channels provide indication over a range of 0% to 100%. There are a total of two Refueling Water Storage Tank Level channels. The instrument loops associated with Refueling Water Storage Tank Level are 63-050 and 63-051.

①

INSERT 1 continued

6. Reactor Coolant Pressure (Wide Range)

Reactor Coolant Pressure (Wide Range) is provided to determine if the plant is in safe shutdown condition. It is also used for maintaining the proper relationship between RCS pressure and temperature, verifying vessel nondestructive testing criteria, maintain primary inventory subcooled (particularly with loss of offsite power), establish correct conditions for residual heat removal operation, determine whether reactor coolant pump operation should be continued, and determine whether high-head SI should be terminated or reinitiated.

The channels provide indication over a range of 0 to 3000 psig. There are a total of three Reactor Coolant Pressure (Wide Range) channels. The instrument loops associated with Reactor Coolant Pressure (Wide Range) are 68-062, 68-066, and 68-069.

7. Pressurizer Level (Wide Range)

Pressurizer Level (Wide Range) is provided to confirm if plant is in a safe shutdown condition. It is also provided to monitor RCS inventory, maintain pressurizer water level, and determine whether SI should be terminated or reinitiated.

The channels provide indication over a range of 0% to 100%. There are a total of three Pressurizer Level (Wide Range) channels. The instrument loops associated with Pressurizer Level (Wide Range) are 68-320, 68-335, and 68-339.

8. Steam Line Pressure

Steam Line Pressure is provided to determine if a high-energy secondary line rupture occurred. It is also provided to maintain an adequate reactor heat sink and verify auxiliary feedwater to steam generator associated with pipe rupture is isolated. It can be used to monitor secondary side pressure to: (1) verify operation of pressure control steam dump system, (2) maintain plant in safe shutdown condition, and (3) monitor RCS cooldown rate. It is diverse to T_{cold} for natural circulation determination. In addition, it can be used for identification of steam generator tube rupture and determination that faulted steam generator is isolated.

The channels provide indication over a range of 0 to 1200 psig. There are a total of eight Steam Line Pressure channels, two per loop. The instrument loops associated with Steam Line Pressure are 1-002A, 1-002B, 1-009A, 1-009B, 1-020A, 1-020B, 1-027A, and 1-027B

①

INSERT 1 continued

9. Steam Generator Level - (Wide Range)

Steam Generator Level (Wide Range) is provided to determine if heat sink is being maintained and is used for SI termination for secondary break outside containment.

The channels provide indication over a range of 0 to 100 percent. There are a total of four Steam Generator Level - (Wide Range) channels, one per steam generator. The instrument loops associated with Steam Generator Level - (Wide Range) are 3-043, 3-056, 3-098, and 3-111.

10. Steam Generator Level - (Narrow Range)

Steam Generator Level (Narrow Range) is provided to monitor heat sink, maintain steam generator water level, determine whether SI should be terminated, and determine which loop has SG tube rupture.

The channels provide indication over a range of 0 to 100 percent. There are a total of eight Steam Generator Level - (Narrow Range) channels, two per steam generator. The instrument loops associated with Steam Generator Level - (Narrow Range) are 3-039, 3-042, 3-052, 3-055, 3-094, 3-097, 3-107, and 3-110.

11. Auxiliary Feedwater

Auxiliary Feedwater (AFW) flow is provided to determine if sufficient flow exists to maintain heat sink and for SI termination. The channels provide indication over a range of 0 to 440 gpm. The redundant channel capability for AFW flow consists of a single AFW flow channel for each Steam Generator (four total, one per steam generator) with a diverse channel consisting of three AFW valve position indicators (two level control valves for the motor driven AFW flowpath and one level control valve for the turbine driven AFW flowpath) for each steam generator (12 total).

The instrument loops associated with AFW flow are 3-163, 3-155, 3-147, and 3-170. The instrument loops associated with AFW valve position indication are 3-164, 3-164A, 3-174, 3-156, 3-156A, 3-173, 3-148, 3-148A, 3-172, 3-171, 3-171A, and 3-175.

①

INSERT 1 continued

12. Reactor Coolant System Subcooling Margin Monitor

Reactor Coolant System Subcooling is provided for SI termination or reinitiation and maintenance of subcooling during depressurization.

The channels provide indication over a range of 200°F subcooled to 35°F superheat. There are a total of two Reactor Coolant System Subcooling Margin Monitor channels. The instrument loops associated with Reactor Coolant System Subcooling Margin Monitor are 94-101 and 94-102.

13. Containment Water Level (Wide Range)

Containment Water Level (Wide Range) is provided to verify water source for recirculation mode cooling, determine whether high energy line rupture has occurred inside or outside containment, and determine potential for containment breach caused by very high water levels.

The channels provide indication over a range of 0% to 100%. There are a total of two Containment Water Level (Wide Range) channels. The instrument loops associated with Containment Water Level (Wide Range) are 63-178 and 63-179.

14. Incore Thermocouples

Incore thermocouples are provided to verify that the core is being adequately cooled, verify that RCS remains subcooled, and for monitoring the potential for fuel clad breach.

The channels provide indication over a range of 200°F to 2300°F. There are a total of 65 Incore Thermocouples. Each channel consists of one incore thermocouple. The minimum number of channels required is two channels per quadrant, eight per core, one/core quadrant/train. The two required channels in each quadrant shall be in different trains.

①

INSERT 1 continued

15. Reactor Vessel Level Instrumentation

Reactor Vessel Level indication is provided for determination of core cooling. It is considered to be a more direct and less ambiguous indication of core cooling.

The channels provide indication over a range of 0% to 120% (dynamic range), 0% to 70% (lower range), and 64% to 120% (upper range). There are a total of six Reactor Vessel Level Instrument channels. The instrument loops associated with Reactor Vessel Level Dynamic Range are 68-367 and 68- 370. The instrument loops associated with Reactor Vessel Level Lower Range are 68-368 and 68-371. The instrument loops associated with Reactor Vessel Level Upper Range are 68-369 and 68-372.

16. Containment Area Radiation Monitors

Containment area radiation monitors are provided for accident diagnosis and SI Termination/Reinitiation.

The channels provide indication over a range of 10^0 to 10^8 R/hr. There are a total of four Containment Area Radiation Monitors. The instrument loops associated with Containment Area Radiation Monitors Upper Compartment are 90-271 and 90-272. The instrument loops associated with Containment Area Radiation Monitors Lower Compartment are 90-273 and 90-274.

17. Neutron Flux

The Intermediate Range and Source Range Neutron Flux are provided for monitoring reactivity control, determining if plant is subcritical, and to diagnose positive reactivity insertion.

The channels provide indication over a range of 1 to 10^6 CPS (Source Range) and 10^{-8} to 200% RTP (Intermediate Range). There are a total of two Source Range channels and two Intermediate Range channels. The instrument loops associated with the Source Range are 92-5001 and 92-5002. The instrument loops associated with the Intermediate Range are 92-5003 and 92-5004.

①

INSERT 1 continued

18. ERCW to AFW Valve Position

The ERCW to AFW valve position is provided for verification of heat sink availability. There is a total of four motor driven pump instrument loops. For the turbine driven AFW pump there is a total of four instrument loops. Each ERCW to AFW suction line contains two in-series isolation valves, each with its own position indication. Thus, position indication on both valves on a suction line is necessary. Each channel consists of the two valve position indications associated with the in-series valves in a single suction line.

The instrument loops associated with ERCW to AFW valve position for the Motor Driven Pumps are 3-116A, 3-116B, 3-126A, and 3-126B. The instrument loops associated with ERCW to AFW valve position for the Turbine Driven Pump are 3-136A, 3-136B, 3-179A, and 3-179B.

19. Containment Isolation Valve Position

Containment Isolation valve position is provided for verification of containment isolation. There is one position indication instrument per isolation valve. The Containment Isolation valve position indications are located on Panels TR-A XX-55-6K and TR-B XX-55-6L

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 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.~~

①

~~6. Reactor Vessel Water Level~~

~~Reactor Vessel Water Level is 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 System provides a direct measurement of the collapsed liquid level above the fuel alignment plate. The collapsed level represents the amount of liquid mass that is in the reactor vessel above the core. Measurement of the collapsed water level is selected because it is a direct indication of the water inventory.~~

~~7. Containment Sump Water Level (Wide Range)~~

~~Containment Sump Water Level is provided for verification and long term surveillance of RCS integrity.~~

~~Containment Sump Water Level is used to determine:~~

- ~~containment sump level accident diagnosis,~~

BASES

LCO (continued)

- ~~when to begin the recirculation procedure, and~~
- ~~whether to terminate SI, if still in progress.~~

~~8. Containment Pressure (Wide Range)~~

~~Containment Pressure (Wide Range) is provided for verification of RCS and containment OPERABILITY.~~

~~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 Position~~

~~Penetration Flow Path CIV Position is provided for verification of Containment OPERABILITY, and Phase A and Phase B isolation.~~

~~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.~~ ①

BASES

LCO (continued)

~~10. Containment Area Radiation (High Range)~~

~~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.~~

~~11. Pressurizer Level~~

~~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.~~

~~12. Steam Generator Water Level (Wide Range)~~

~~SG Water Level is provided to monitor operation of decay heat removal via the SGs. The Category I indication of SG level is the 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

~~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.~~

~~SG Water Level (Wide Range) is used to:~~

- ~~identify the faulted SG following a tube rupture,~~
- ~~verify that the intact SGs are an adequate heat sink for the reactor,~~
- ~~determine the nature of the accident in progress (e.g., verify an SGTR), and~~
- ~~verify unit conditions for termination of SI during secondary unit HELBs outside containment.~~

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 operator must manually raise and control SG level to 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~~

~~CST Level is provided to ensure water supply for auxiliary feedwater (AFW). The CST provides the ensured safety grade water supply for the AFW System. The CST consists of two identical tanks connected by a common outlet header. Inventory is monitored by a 0 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.~~

~~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 provided for verification and long term surveillance of core cooling.~~

~~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~~

①

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.~~

~~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.~~ ①

~~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~~

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.~~

1

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

A Note is added stating that this ACTION is not applicable to Function 16, which has its own ACTION for one channel inoperable.

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.

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INSERT 2

①

INSERT 2

On a penetration where the position indication is declared inoperable on a valve but on the opposite side of the penetration a required containment isolation valve does not exist (such as with a closed system or a check valve), only Condition A must be entered. However, valves FCV-63-158 & -172 are both inboard penetration valves, but if both valves have inoperable position indication, Condition C must be entered until at least one of the valve's position indication is restored to OPERABLE status. Valves FCV-30-46 & VLV-30-571, FCV-30-47 & VLV-30-572, and FCV-30-48 & VLV-30-573 are all outboard penetration valves, but if both valves have inoperable position indication, Condition C must be entered until at least one of the valve's position indication is restored to OPERABLE status.

BASES

ACTIONS (continued)

B.1

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, which requires a written report to be submitted to the NRC immediately. This report discusses the results of 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

Condition C applies when one or more Functions have two inoperable required channels (i.e., two channels inoperable in the same Function). Required Action C.1 requires restoring one channel in the Function(s) to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

G

~~D~~.1

G

Conditions C, D, E, or F are

G

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.

5

Condition C, D, E, or F

G

5

INSERT 3

⑤

INSERT 3

D.1

Condition D applies when one or more Functions have three required channels that are inoperable. A Note is included that states that this ACTION is only applicable to Functions 6 and 7. Required Action D.1 requires restoring one inoperable channel to OPERABLE status within 48 hours.

E.1

Condition E applies when one or more steam generators have one AFW flow rate channel and one AFW valve position channel on the same steam generator inoperable. Required Action E.1 requires restoring one inoperable channel to OPERABLE status within 7 days.

F.1 and F.2

Condition F applies when one or more Containment Area Radiation Monitors have one required channel inoperable. Required Action F.1 requires initiating an alternate method of monitoring containment area radiation within 72 hours. Required Action F.2 requires restoring the inoperable channel(s) to OPERABLE status within 30 days.

BASES

ACTIONS (continued)

~~E~~.1 and ~~E~~.2 H ⑤

If the Required Action and associated Completion Time of Condition C , D, E, or F is not met and Table 3.3.3-1 directs entry into Condition ~~E~~ H, 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. ⑤

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 I ⑤

~~At this unit,~~ Condition F requires initiation of alternate means of monitoring ~~Reactor Vessel Water Level and~~ Containment Area Radiation ~~have been developed and tested~~. ① 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.

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~~ 2 apply to each PAM instrumentation Function in Table 3.3.3-1. ⑤

SR 3.3.3.1

Performance of the CHANNEL CHECK 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.

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.~~ ⑥

~~OR~~

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

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

SR 3.3.3.2

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 is
two Notes. The first
modified by ~~a~~ Note ~~that~~ excludes neutron detectors. The calibration ⑤
method for neutron detectors is specified in the Bases of LCO 3.3.1,
"Reactor Trip System (RTS) Instrumentation." INSERT 4 Whenever a sensing ①
element is replaced, the next required CHANNEL CALIBRATION of the
Incore ~~Core Exit~~ thermocouple sensors is accomplished by an inplace cross ⑤
calibration that compares the other sensing elements with the recently
installed sensing element. ~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~ ⑥

①

INSERT 4

The second Note excludes the Containment Area Radiation Monitors detectors from a CHANNEL CALIBRATION for decade ranges above 10R/h. A CHANNEL CALIBRATION for the Containment Area Radiation Monitors detectors for decade ranges below 10R/h is performed by a single calibration check with either an installed or portable gamma source.

BASES

SURVEILLANCE REQUIREMENTS (continued)

6

~~OR~~

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

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

3

REFERENCES

~~[~~ 1. ~~Unit specific document (e.g., FSAR, NRC Regulatory Guide 1.97 SER letter)~~. ~~]~~

2. Regulatory Guide 1.97, ~~[date]~~.

Revision 2, December 1980

3. NUREG-0737, Supplement 1, "TMI Action Items."

SQN-EEB-PS-PAM-0001, PAM Variable QA Data - Base

1

SEQUOYAH UNIT 2

Revision XXX

1

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.3 BASES, POST ACCIDENT MONITORING (PAM) 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. Regulatory Guide (RG) 1.97, Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Revision 2, (RG 1.97-R2) identifies categories that provide a graded approach to requirements depending on the importance to safety of the measurement of a specific variable, designating them as either Category 1, 2, or 3 variables. Changes are made to the ITS Bases to conform to the RG 1.97-R2 convention for identifying the different categories.

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

4. Editorial changes made for enhanced clarity.

5. Changes are made to be consistent with changes made to the Specification.

6. ISTS SR 3.3.3.1 and SR 3.3.3.2 (ITS SR 3.3.3.1 and SR 3.3.3.2) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.3.3.1 and ITS SR 3.3.3.2 are "In accordance with the Surveillance Frequency Control Program."

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 No Significant Hazards Considerations for this Specification.

ATTACHMENT 4

ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

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

INSTRUMENTATION

REMOTE SHUTDOWN INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.4

3.3.3.5 The remote shutdown monitoring instrumentation channels ~~shown in Table 3.3-9~~ shall be OPERABLE ~~with readouts displayed external to the control room~~. LA01

Applicability

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

Add proposed ACTIONS Note A02

ACTION A

ACTION B

With the number of OPERABLE remote shutdown monitoring channels less than required ~~by Table 3.3-9,~~ restore the inoperable channel(s) to OPERABLE status within ~~7~~ 30 days, or be in HOT SHUTDOWN within the next 12 hours.

LA01

Add proposed Required Action B.1 M01

L01

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1, SR 3.3.4.2

4.3.3.5 Each remote shutdown monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-6.

for each required instrumentation channel that is normally energized L02

Add proposed SR 3.3.4.2 Note 1 L03

A01

~~TABLE 3.3-9~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~

	~~INSTRUMENT~~	~~READOUT LOCATION~~	~~MEASUREMENT RANGE~~	~~MINIMUM CHANNELS OPERABLE~~
~~1.~~	~~Source Range Nuclear Flux~~	~~NOTE 1~~	~~1 to 1 x 10^6 cps~~	~~1~~
~~2.~~	~~Reactor Trip Breaker Indication~~	~~at trip switchgear~~	~~OPEN-CLOSE~~	~~1/trip breaker~~
~~3.~~	~~Reactor Coolant Temperature - Hot Leg~~	~~NOTE 1~~	~~0-650°F~~	~~1/loop~~
~~4.~~	~~Pressurizer Pressure~~	~~NOTE 1~~	~~0-3000 psig~~	~~1~~
~~5.~~	~~Pressurizer Leve1~~	~~NOTE 1~~	~~0-100%~~	~~1~~
~~6.~~	~~Steam Generator Pressure~~	~~NOTE 1~~	~~0-1200 psig~~	~~1/steam generator~~
~~7.~~	~~Steam Generator Leve1~~	~~NOTE 2 or near Auxilary F. W. Pump~~	~~0-100%~~	~~1/steam generator~~
~~8.~~	~~Deleted~~			
~~9.~~	~~RHR Flow Rate~~	~~NOTE 1~~	~~0-4500 gpm~~	~~1~~
~~10.~~	~~RHR Temperature~~	~~NOTE 1~~	~~50-400°F~~	~~1~~
~~11.~~	~~Auxiliary Feedwater Flow Rate~~	~~NOTE 1~~	~~0-440 gpm~~	~~1/steam generator~~

LA01

~~TABLE 3.3-9 (Continued)~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~

LA01

~~INSTRUMENT~~	~~READOUT LOCATION~~	~~MEASUREMENT RANGE~~	~~MINIMUM CHANNELS OPERABLE~~
~~12. Pressurizer Relief Tank Pressure~~	~~NOTE 1~~	~~0-100 psig~~	~~1~~
~~13. Containment Pressure~~	~~NOTE 1~~	~~-1 to +15 psig~~	~~1~~

~~NOTE 1: Auxiliary Control Room Panel 1-L-10~~

~~NOTE 2: Auxiliary Control Room Panels 1-L-11A and 1-L-11B~~

A01

~~TABLE 4.3-6~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

LA01

SR 3.3.4.2 Note 2

~~INSTRUMENT~~	SR 3.3.4.1 CHANNEL CHECK	SR 3.3.4.2 CHANNEL CALIBRATION
~~1. Source Range Nuclear Flux~~	~~M~~	~~R~~
~~2. Reactor Trip Breaker Indication~~	~~M~~	~~N.A.~~
~~3. Reactor Coolant Temperature - Hot Leg~~	~~M~~	~~R~~
~~4. Pressurizer Pressure~~	~~M~~	~~R~~
~~5. Pressurizer Leve1~~	~~M~~	~~R~~
~~6. Steam Generator Pressure~~	~~M~~	~~R~~
~~7. Steam Generator Leve1~~	~~M~~	~~R~~
~~8. Deleted~~		
~~9. RHR Flow Rate~~	~~M~~	~~R~~
~~10. RHR Temperature~~	~~M~~	~~R~~
~~11. Auxiliary Feedwater Flow Rate~~	~~M~~	~~R~~
~~12. Pressurizer Relief Tank Pressure~~	~~M~~	~~R~~
~~13. Containment Pressure~~	~~M~~	~~R~~

In accordance with the Surveillance Frequency Control Program

LA02

CHLORINE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

This specification deleted.

INSTRUMENTATION

REMOTE SHUTDOWN INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.4

3.3.3.5 The remote shutdown monitoring instrumentation channels ~~shown in Table 3.3-9~~ shall be OPERABLE ~~with readouts displayed external to the control room~~.

LA01

Applicability

APPLICABILITY: MODES 1, 2 and 3.

Add proposed ACTIONS Note.

A02

ACTION:

LA01

ACTION A

ACTION B

With the number of OPERABLE remote shutdown monitoring channels less than required ~~by Table 3.3-9~~, restore the inoperable channel(s) to OPERABLE status within ~~7~~ 30 days, or be in HOT SHUTDOWN within the next 12 hours.

Add proposed Required Action B.1.

M01

L01

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1,
SR 3.3.4.2

4.3.3.5 Each remote shutdown monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-6.

for each required instrumentation channel that is normally energized

L02

Add proposed SR 3.3.4.2 Note 1.

L03

~~TABLE 3.3-9~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~READOUT LOCATION~~	~~MEASUREMENT RANGE~~	~~MINIMUM CHANNELS OPERABLE~~
~~1. Source Range Nuclear Flux~~	~~NOTE 1~~	~~1 to 1 x 10^6 cps~~	~~1~~
~~2. Reactor Trip Breaker Indication~~	~~at trip switchgear~~	~~OPEN-CLOSE~~	~~1/trip breaker~~
~~3. Reactor Coolant Temperature - Hot Leg~~	~~NOTE 1~~	~~0-650°F~~	~~1/loop~~
~~4. Pressurizer Pressure~~	~~NOTE 1~~	~~0-3000 psig~~	~~1~~
~~5. Pressurizer Level~~	~~NOTE 1~~	~~0-100%~~	~~1~~
~~6. Steam Generator Pressure~~	~~NOTE 1~~	~~0-1200 psig~~	~~1/steam generator~~
~~7. Steam Generator Level~~	~~NOTE 2 or near Auxilary F. W. Pump~~	~~0-100%~~	~~1/steam generator~~
~~8. Deleted~~			
~~9. RHR Flow Rate~~	~~NOTE 1~~	~~0-4500 gpm~~	~~1~~
~~10. RHR Temperature~~	~~NOTE 1~~	~~50-400°F~~	~~1~~
~~11. Auxiliary Feedwater Flow Rate~~	~~NOTE 1~~	~~0-440 gpm~~	~~1/steam generator~~

LA01

A01

~~TABLE 3.3-9 (Continued)~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~READOUT LOCATION~~	~~MEASUREMENT RANGE~~	~~MINIMUM CHANNELS OPERABLE~~
~~12. Pressurizer Relief Tank Pressure~~	~~NOTE 1~~	~~0-100 psig~~	~~1~~
~~13. Containment Pressure~~	~~NOTE 1~~	~~-1 to +15 psig~~	~~1~~

LA01

~~NOTE 1: Auxiliary Control Room Panel 2-L-10~~

~~NOTE 2: Auxiliary Control Room Panels 2-L-11A and 2-L-11B~~

ITS

A01

ITS 3.3.4

~~TABLE 4.3-6~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

LA01

SR 3.3.4.2 Note 2

~~INSTRUMENT~~	SR 3.3.4.1 CHANNEL CHECK	SR 3.3.4.2 CHANNEL CALIBRATION
~~1. Source Range Nuclear Flux~~	~~M~~	~~R~~
~~2. Reactor Trip Breaker Indication~~	~~M~~	~~N.A.~~
~~3. Reactor Coolant Temperature - Hot Leg~~	~~M~~	~~R~~
~~4. Pressurizer Pressure~~	~~M~~	~~R~~
~~5. Pressurizer Level~~	~~M~~	~~R~~
~~6. Steam Generator Pressure~~	~~M~~	~~R~~
~~7. Steam Generator Level~~	~~M~~	~~R~~
~~8. Deleted~~		
~~9. RHR Flow Rate~~	~~M~~	~~R~~
~~10. RHR Temperature~~	~~M~~	~~R~~
~~11. Auxiliary Feedwater Flow Rate~~	~~M~~	~~R~~
~~12. Pressurizer Relief Tank Pressure~~	~~M~~	~~R~~
~~13. Containment Pressure~~	~~M~~	~~R~~

In accordance with the Surveillance Frequency Control Program

LA02

INSTRUMENTATION

CHLORINE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

This specification deleted.

DISCUSSION OF CHANGES
ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.3.5 ACTION provides the compensatory actions to take when a remote shutdown monitoring channel is inoperable. ITS 3.3.4 ACTIONS provide the compensatory actions to take for inoperable remote shutdown monitoring instrumentation functions. ITS 3.3.4 ACTIONS contain a NOTE that allows separate Condition entry for each Function. This modifies the CTS by providing a specific allowance to enter the ACTION(s) for each remote shutdown monitoring instrumentation Function that is inoperable.

This change is acceptable because it clearly states the current requirement. The CTS considers each remote shutdown monitoring instrument Function to be separate and independent from the others. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.5 ACTION requires that if the remote shutdown monitoring channel cannot be restored to OPERABLE status within 7 days, to be in HOT SHUTDOWN within the next 12 hours. ITS 3.3.4 ACTION B requires that if the required channel cannot be restored to OPERABLE status within 30 days, then be in MODE 3 within 6 hours and in MODE 4 within 12 hours. (See DOC L01 for a discussion of restoring the remote shutdown monitoring channel to OPERABLE status from 7 days to 30 days.) This changes the CTS by requiring the unit to be in MODE 3 within 6 hours.

The purpose of ITS 3.3.4 Required Action B.1 is to specify an acceptable Completion Time to shut down the unit from full power to MODE 3. This change is acceptable because the proposed Completion Time is sufficient to allow an operator to reduce power from full power to MODE 3 in a controlled manner without challenging unit safety systems. The six hour Completion Time provided to reach MODE 3 from full power is consistent with the time provided in similar Actions in both the CTS and ITS. The change has been designated as more restrictive because it specifies the amount of time allocated to place the unit in MODE 3.

DISCUSSION OF CHANGES
ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.3.3.5 requires the remote shutdown monitoring instrumentation channels in Table 3.3-9 to be OPERABLE with the readouts displayed external to the control room. CTS Table 3.3-9 lists each of the required remote shutdown monitoring instruments, the readout location, measurement range, and the minimum number of channels required for each instrument. CTS Table 4.3-6 lists the required remote shutdown monitoring instrumentation and their associated Surveillance Requirements. ITS LCO 3.3.4 states that the Remote Shutdown Monitoring Instrumentation Functions shall be OPERABLE. This changes the CTS by moving the details in CTS 3.3.3.5, Table 3.3-9, and Table 4.3-6, with the exception of the Surveillance Requirements, from the Technical Specifications to the ITS Bases.

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

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.3.3.5 and Table 4.3-6 require that the remote shutdown monitoring instrumentation channels be demonstrated OPERABLE at least once per month by a CHANNEL CHECK and once every 18 months by CHANNEL CALIBRATION. ITS SR 3.3.4.1 and SR 3.3.4.2 require similar Surveillances, but specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and the associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.3.3.5 ACTION requires, in part, to restore the inoperable channel(s) to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours. ITS 3.3.4 Required Action A.1 requires the restoration of the channel to OPERABLE status in 30 days. This changes the CTS by extending the time allowed to restore the inoperable channel to OPERABLE status from 7 days to 30 days.

The purpose of the CTS 3.3.3.5 ACTIONS is to ensure that the inoperable channels are restored to OPERABLE status in a reasonable amount of time. The ITS 3.3.4 Required Action A.1 30 day Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room. 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 an event requiring control room evacuation occurring during the allowed Completion Time. This change is designated as less restrictive, because ITS allows additional time to restore the inoperable remote shutdown monitoring instrumentation channels to an OPERABLE status than was allowed in CTS.

L02 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.3.3.5 states, in part that each remote shutdown monitoring instrumentation channel shall be demonstrated OPERABLE by performance of a CHANNEL CHECK. ITS SR 3.3.4.1 requires the performance of a CHANNEL CHECK for each required instrumentation channel that is normally energized. This changes the CTS by not requiring a CHANNEL CHECK on normally deenergized instrument channels.

The purpose of CTS 4.3.3.5 is a less formal, but more frequent, check of instrumentation channels during normal operation. CTS 4.3.3.5 requires a CHANNEL CHECK on all instruments either deenergize or energized. ITS SR 3.3.4.1 requires a CHANNEL CHECK on instrumentation channels that are normally energized. These checks ensure a gross failure of instrumentation has not occurred. For those instruments not normally energized, such as the Source Range Neutron Flux, a check of this nature is not required. Additionally, the 18 month CHANNEL CALIBRATION will ensure that the instrument is periodically tested to ensure it responds within the necessary range and accuracy. This change is acceptable because this relaxation has been evaluated to ensure that it provides an acceptable level of equipment reliability. This change is designated as less restrictive because CHANNEL CHECKS on deenergized instrumentation channels will be performed less frequently under the ITS than under the CTS.

L03 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS Table 4.3-6 requires the performance of a Source Range Neutron Flux CHANNEL CALIBRATION. ITS SR 3.3.4.2 contains a similar Surveillance requirement; however, the Surveillance includes a Note (Note 1) that excludes the neutron detectors from the calibration. This changes the CTS by excluding the source range neutron flux neutron detectors from the CHANNEL CALIBRATION Surveillance.

The purpose of ITS SR 3.3.4.2 Note 1 is to exclude the neutron detectors from the CHANNEL CALIBRATION. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary to demonstrate that the equipment used to meet the LCO can perform its required function. This change is acceptable because the neutron detectors are passive devices and because of the difficulty in generating an appropriate detector input signal. This change is designated less restrictive because less stringent surveillance requirements are applied in the ITS than in the CTS.

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

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown ~~System~~ Monitoring Instrumentation ①

3.3.3.5 LCO 3.3.4 The Remote Shutdown ~~System~~ Monitoring Instrumentation Functions shall be OPERABLE. ①

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

DOC A02
---NOTE---
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION	A. One or more required Functions inoperable.	A.1 Restore required Function(s) to OPERABLE status.	30 days
ACTION, 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
4.3.3.5, Table 4.3-6 DOC L02	SR 3.3.4.1 ~~[~~ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ② ③ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~ ② ③

SURVEILLANCE REQUIREMENTS (continued)

	~~SR 3.3.4.2~~	~~Verify each required control circuit and transfer switch is capable of performing the intended function.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	⑤
DOC L03 4.3.3.5, Table 4.3-6,	SR 3.3.4.~~3~~ 2	------------------------------NOTES------------------------------ 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker indication is excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ⑥ ③ ③
	~~SR 3.3.4.4~~	~~[Perform TADOT of the reactor trip breaker open/closed indication.~~	~~[18 months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~	⑦

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown ~~System~~ Monitoring Instrumentation ①

3.3.3.5 LCO 3.3.4 The Remote Shutdown ~~System~~ Monitoring Instrumentation Functions shall be OPERABLE. ①

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTE---

DOC A02 Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION	A. One or more required Functions inoperable.	A.1 Restore required Function(s) to OPERABLE status.	30 days
ACTION, 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
4.3.3.5, Table 4.3-6 DOC L02	SR 3.3.4.1 ~~[~~ Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	~~[31 days~~ ② ③ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~ ② ③

CTS

SURVEILLANCE REQUIREMENTS (continued)

	~~SR 3.3.4.2~~	~~Verify each required control circuit and transfer switch is capable of performing the intended function.~~	~~[[18] months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤
DOC L03 4.3.3.5, Table 4.3-6,	SR 3.3.4.~~3~~2	------------------------------NOTES------------------------------ 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Reactor trip breaker indication is excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION for each required instrumentation channel.	⑤ ⑥ ~~[[18] months~~ ~~OR~~ ③ In accordance with the Surveillance Frequency Control Program ~~]~~ ③
	~~SR 3.3.4.4~~	~~[Perform TADOT of the reactor trip breaker open/closed indication.~~	~~[18 months~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~ ⑦

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

1. ISTS 3.3.4 requires Remote Shutdown System Functions to be OPERABLE. As stated in the ISTS 3.3.4 Bases, these Functions include not only instrumentation to monitor plant parameters, but also control switches and circuits to operate equipment necessary to shutdown and maintain the plant in MODE 3. The requirements of ITS 3.3.4 only include the instrumentation necessary to monitor the prompt shut down to MODE 3, including the necessary instrumentation to support maintaining the unit in a safe condition in MODE 3. This change is consistent with the current licensing basis for the Remote Shutdown Instrumentation in CTS 3.3.3.5. As a result of this change, the Specification title and LCO statement have been changed from "Remote Shutdown System" to "Remote Shutdown Monitoring Instrumentation."

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

3. ISTS SR 3.3.4.1 and SR 3.3.4.3 (ITS SR 3.3.4.1 and SR 3.3.4.2, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

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.

5. ISTS SR 3.3.4.2 requires verification that each required control circuit and transfer switch is capable of performing its intended function. ITS 3.3.4 does not contain this Surveillance Requirements since remote shutdown monitoring instrumentation does not contain control circuits or transfer switches. This change is consistent with the current licensing bases. Additionally, since ISTS SR 3.3.4.2 has been deleted, subsequent Surveillances have been renumbered.

6. This change is made to be consistent with existing requirements in CTS Table 4.3-6.

7. ISTS SR 3.3.4.4 requires performance of a TADOT of the reactor trip breaker open/closed indication. This requirement has not been included in the SQN ITS. CTS 3.3.3.5 does not contain this requirement. Thus, this deviation from the ISTS has been made to retain the SQN current licensing basis.

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

B 3.3 INSTRUMENTATION

B 3.3.4 Remote Shutdown ~~System~~ Monitoring Instrumentation ①

BASES

BACKGROUND

The Remote Shutdown ~~System~~ Monitoring Instrumentation provides the control room operator with ① sufficient instrumentation ~~and controls~~ to ~~place~~ support placing and ~~maintain~~ maintaining 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~~ Main Steam Safety Valves (MSSV) or the ~~SG~~ atmospheric ~~dump~~ relief valves (~~ADVs~~ ARVs) can be used to remove core decay heat ② 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~~ monitor the status of the reactor at the ~~remote shutdown panel, and place and maintain the unit in MODE 3~~ locations shown on Table B 3.3.4-1. ~~Not all controls and necessary transfer switches are located at the remote shutdown panel. Some controls and transfer switches will have to be operated locally at the switchgear, motor control panels, or other local stations.~~ ② The unit automatically reaches MODE 3 following a unit shutdown and can be maintained safely in MODE 3 for an extended period of time.

The OPERABILITY of the remote shutdown ~~control and~~ monitoring instrumentation ② functions ensures there is sufficient information available on selected unit parameters to ~~place~~ support placing and ~~maintain~~ maintaining the unit in MODE 3 should the control ② room become inaccessible.

APPLICABLE SAFETY ANALYSES

The Remote Shutdown ~~System~~ Monitoring Instrumentation is required to provide equipment at ① appropriate locations outside the control room with a capability to ~~promptly shut down~~ support placing and ~~maintain~~ maintaining the unit in a safe condition in MODE 3. ②

The criteria governing the design and specific system requirements of the Remote Shutdown ~~System~~ Monitoring Instrumentation are located in 10 CFR 50, Appendix A, ① GDC 19 (Ref. 1).

The Remote Shutdown ~~System~~ Monitoring Instrumentation satisfies Criterion 4 of ① 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The Remote Shutdown ~~System~~ Monitoring Instrumentation LCO provides the OPERABILITY requirements of the instrumentation ~~and controls~~ necessary to ~~place~~ support placing and ~~maintain~~ maintaining 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. ①

The ~~controls,~~ monitoring instrumentation~~, and transfer switches are~~ is required for:

- Core reactivity control (initial and long term)~~,~~; ③
- RCS pressure control~~,~~; ③ ②
- ~~Decay~~ Reactor heat removal ~~via the AFW System and the SG safety valves or SG ADVs,~~; and ③
- RCS ~~inventory control via charging flow, and~~ makeup.
- ~~Safety support systems for the above Functions, including service water, component cooling water, and onsite power, including the diesel generators.~~

A Function of ~~a~~ Remote Shutdown ~~System~~ monitoring instrumentation is OPERABLE if ~~all~~ each instrument ~~and control channels~~ needed to support the Remote Shutdown ~~System~~ monitoring instrumentation ~~Function are~~ is OPERABLE. ~~In some cases,~~ For Table B 3.3.4-1, Function 7, ~~may indicate that~~ the required information ~~or control capability~~ is available from several alternate sources. In ~~these cases~~ this case, the Function is OPERABLE as long as one channel of any of the alternate information ~~or control~~ sources is OPERABLE. ① ②

The remote shutdown ~~instrument and control circuits~~ monitoring instrumentation covered by this LCO do es 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 Remote Shutdown ~~System~~ Monitoring Instrumentation be placed in operation. ① ③ ①

APPLICABILITY

The Remote Shutdown ~~System~~ Monitoring Instrumentation 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. ①

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 the necessary instrument ~~control functions~~ channels if control room instruments ~~or controls~~ become unavailable. ②

BASES

ACTIONS

The ~~A~~ Remote Shutdown Monitoring Instrumentation LCO is not met ~~System division is inoperable~~ when any required ~~each function is not accomplished by at least one designated Remote Shutdown System~~ channel does not satisfy its ~~that satisfies the~~ OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases. ①

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. ②

A.1

Condition A addresses the situation where one or more required Functions of ~~the~~ Remote Shutdown Monitoring Instrumentation ~~System~~ are inoperable. ~~This includes the control and transfer switches for any required Function.~~ ① ②

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 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.

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.~~

~~OR~~

⑤

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

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

⑥

~~SR 3.3.4.2~~

~~SR 3.3.4.2 verifies each required Remote Shutdown System control circuit and transfer switch performs the intended function. This verification is performed from the remote shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the unit can be placed and maintained in MODE 3 from the 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~~

④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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 remote shutdown control channels usually pass the Surveillance test when performed at the [18] month Frequency.~~

~~OR~~ ④

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

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

2
SR 3.3.4.~~3~~ ④

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.

temperature
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. ②

INSERT 1 ⑦

~~[The Frequency of [18] months is based upon operating experience and consistency with the typical industry refueling cycle.~~ ⑤

~~OR~~

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

⑦

INSERT 1

This SR is modified by two Notes, Note 1 excludes the neutron detectors and Note 2 excludes the reactor trip breaker indication from the CHANNEL CALIBRATION.

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

⑥

~~[SR 3.3.4.4~~

~~SR 3.3.4.4 is the performance of a TADOT. 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 of 18 months is based upon operating experience and consistency with the typical industry refueling outage.~~

~~OR~~

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

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

④

REFERENCES 1. 10 CFR 50, Appendix A, GDC 19.

Table B 3.3.4-1 (page 1 of 1)
Remote Shutdown ~~System~~ Monitoring Instrumentation ~~and Controls~~ ①

INSERT 2 ②

~~FUNCTION/INSTRUMENT 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~~ ⑥

~~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.~~

~~REVIEWER'S NOTE~~ ⑥

~~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.~~

②

INSERT 2

FUNCTION	READOUT LOCATION	MEASUREMENT RANGE	REQUIRED NUMBER OF CHANNELS
1. Source Range Nuclear Flux	Auxiliary Control Room Panel 1-L-10	1 to 1 x 10^6 cps	1
2. Reactor Trip Breaker Indication	at trip switchgear	OPEN-CLOSE	1/trip breaker
3. Reactor Coolant Temperature - Hot Leg	Auxiliary Control Room Panel 1-L-10	0-650°F	1/loop
4. Pressurizer Pressure	Auxiliary Control Room Panel 1-L-10	0-3000 psig	1
5. Pressurizer Level	Auxiliary Control Room Panel 1-L-10	0-100%	1
6. Steam Generator Pressure	Auxiliary Control Room Panel 1-L-10	0-1200 psig	1/steam generator
7. Steam Generator Level	Auxiliary Control Room Panels 1-L-11A and 1-L-11B or near Auxiliary Feedwater Pump	0-100%	1/steam generator
8. RHR Flow Rate	Auxiliary Control Room Panel 1-L-10	0-4500 gpm	1
9. RHR Temperature	Auxiliary Control Room Panel 1-L-10	50-400°F	1
10. Auxiliary Feedwater Flow Rate	Auxiliary Control Room Panel 1-L-10	0-440 gpm	1/steam generator
11. Pressurizer Relief Tank Pressure	Auxiliary Control Room Panel 1-L-10	0-100 psig	1
12. Containment Pressure	Auxiliary Control Room Panel 1-L-10	-1 to +15 psig	1

B 3.3 INSTRUMENTATION

B 3.3.4 Remote Shutdown ~~System~~ Monitoring Instrumentation ①

BASES

BACKGROUND

The Remote Shutdown ~~System~~ Monitoring Instrumentation provides the control room operator with ① sufficient instrumentation ~~and controls~~ to ~~place~~ support placing and ~~maintain~~ maintaining 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 Main Steam Safety Valves (MSSV) ~~steam generator (SG) safety valves~~ or the ~~SG~~ atmospheric relief ~~dump~~ valves (ARVs ~~ADVs~~) can be used to remove core decay heat ② 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~~ monitor the status of the reactor at the ~~remote shutdown panel, and place and maintain the unit in MODE 3~~ locations shown on Table B 3.3.4-1. ~~Not all controls and necessary transfer switches are located at the 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 ② unit shutdown and can be maintained safely in MODE 3 for an extended period of time.

The OPERABILITY of the remote shutdown ~~control~~ monitoring ~~and~~ instrumentation ② functions ensures there is sufficient information available on selected unit parameters to ~~place~~ support placing and ~~maintain~~ maintaining the unit in MODE 3 should the control ② room become inaccessible.

APPLICABLE SAFETY ANALYSES

The Remote Shutdown ~~System~~ Monitoring Instrumentation is required to provide equipment at ① appropriate locations outside the control room with a capability to ~~promptly shut down~~ support placing and ~~maintain~~ maintaining the unit in a safe condition in MODE 3. ②

The criteria governing the design and specific system requirements of the Remote Shutdown ~~System~~ Monitoring Instrumentation are located in 10 CFR 50, Appendix A, ① GDC 19 (Ref. 1).

The Remote Shutdown ~~System~~ Monitoring Instrumentation satisfies Criterion 4 of ① 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The Remote Shutdown ~~System~~ Monitoring Instrumentation LCO provides the OPERABILITY requirements of the instrumentation ~~and controls~~ necessary to ~~place~~ support placing and ~~maintain~~ maintaining 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. ①

The ~~controls,~~ monitoring instrumentation~~, and transfer switches are~~ is required for: ③

- Core reactivity control (initial and long term)~~,~~ ; ③
- RCS pressure control~~,~~ ; ③ ②
- ~~Decay~~ Reactor heat removal ~~via the AFW System and the SG safety valves or SG ADVs,~~ ; and ③
- RCS ~~inventory control via charging flow, and~~ makeup.
- ~~Safety support systems for the above Functions, including service water, component cooling water, and onsite power, including the diesel generators.~~

A Function of ~~a~~ Remote Shutdown ~~System~~ monitoring instrumentation is OPERABLE if ~~all~~ each instrument ~~and control channels~~ monitoring instrumentation needed to support the Remote Shutdown ~~System Function are~~ Function 7, is OPERABLE. ~~In some cases,~~ For Table B 3.3.4-1~~, may indicate that~~ the required information ~~or control capability~~ is available from several alternate sources. In ~~these cases~~ this case, the Function is OPERABLE as long as one channel of any of the alternate information ~~or control~~ sources is OPERABLE. ① ②

The remote shutdown ~~instrument and control circuits~~ monitoring instrumentation covered by this LCO does 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 Remote Shutdown ~~System~~ Monitoring Instrumentation be placed in operation. ① ③ ①

APPLICABILITY

The Remote Shutdown ~~System~~ Monitoring Instrumentation 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. ①

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 the necessary instrument ~~control functions~~ channels if control room instruments ~~or controls~~ become unavailable. ②

BASES

ACTIONS

The ~~A~~ Remote Shutdown Monitoring Instrumentation LCO is not met ~~System division is inoperable~~ when any required ~~each function is not accomplished by at least one designated Remote Shutdown System~~ channel does not satisfy its ~~that satisfies the~~ OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases. ①

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. ②

A.1

Condition A addresses the situation where one or more required Functions of ~~the~~ Remote Shutdown Monitoring Instrumentation ~~System~~ are inoperable. ~~This includes the control and transfer switches for any required Function.~~ ① ②

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 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.

①

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.~~

~~OR~~

⑤

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

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

⑥

~~SR 3.3.4.2~~

~~SR 3.3.4.2 verifies each required Remote Shutdown System control circuit and transfer switch performs the intended function. This verification is performed from the remote shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the unit can be placed and maintained in MODE 3 from the 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~~

④

②

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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 remote shutdown control channels usually pass the Surveillance test when performed at the [18] month Frequency.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ ④

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

SR 3.3.4.~~3~~ 2 ④

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 temperature 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. ②

INSERT 1 ⑦

~~[The Frequency of [18] months is based upon operating experience and consistency with the typical industry refueling cycle.~~

~~OR~~ ⑤

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

⑦

INSERT 1

This SR is modified by two Notes, Note 1 excludes the neutron detectors and Note 2 excludes the reactor trip breaker indication from the CHANNEL CALIBRATION.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

⑥

~~[SR 3.3.4.4~~

~~SR 3.3.4.4 is the performance of a TADOT. 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 of 18 months is based upon operating experience and consistency with the typical industry refueling outage.~~

~~OR~~

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

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

④

REFERENCES 1. 10 CFR 50, Appendix A, GDC 19.

Table B 3.3.4-1 (page 1 of 1)
Remote Shutdown ~~System~~ Monitoring Instrumentation ~~and Controls~~ ①

INSERT 2 ②

~~FUNCTION/INSTRUMENT 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~~ ⑥

~~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.~~

~~REVIEWER'S NOTE~~ ⑥

~~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.~~

②

INSERT 2

FUNCTION	READOUT LOCATION	MEASUREMENT RANGE	REQUIRED NUMBER OF CHANNELS
1. Source Range Nuclear Flux	Auxiliary Control Room Panel 2-L-10	1 to 1 x 10^6 cps	1
2. Reactor Trip Breaker Indication	at trip switchgear	OPEN-CLOSE	1/trip breaker
3. Reactor Coolant Temperature - Hot Leg	Auxiliary Control Room Panel 2-L-10	0-650°F	1/loop
4. Pressurizer Pressure	Auxiliary Control Room Panel 2-L-10	0-3000 psig	1
5. Pressurizer Level	Auxiliary Control Room Panel 2-L-10	0-100%	1
6. Steam Generator Pressure	Auxiliary Control Room Panel 2-L-10	0-1200 psig	1/steam generator
7. Steam Generator Level	Auxiliary Control Room Panels 2-L-11A and 2-L-11B or near Auxiliary Feedwater Pump	0-100%	1/steam generator
8. RHR Flow Rate	Auxiliary Control Room Panel 2-L-10	0-4500 gpm	1
9. RHR Temperature	Auxiliary Control Room Panel 2-L-10	50-400°F	1
10. Auxiliary Feedwater Flow Rate	Auxiliary Control Room Panel 2-L-10	0-440 gpm	1/steam generator
11. Pressurizer Relief Tank Pressure	Auxiliary Control Room Panel 2-L-10	0-100 psig	1
12. Containment Pressure	Auxiliary Control Room Panel 2-L-10	-1 to +15 psig	1

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.4 BASES, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

1. ISTS B 3.3.4 Bases have been changed to reflect that the instruments in Table B 3.3.4-1 are for remote shutdown monitoring. Therefore, the words "Remote Shutdown System" have been changed to "Remote Shutdown Monitoring Instrumentation" throughout the Bases.

2. 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.

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

4. Changes are made to be consistent with changes made to the Specification.

5. ISTS SR 3.3.4.1 and SR 3.3.4.3 (ITS SR 3.3.4.1 and SR 3.3.4.2, respectively) Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

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

7. ITS SR 3.3.4.2 contains two NOTES that provide an allowance to exclude neutron detectors and the reactor trip breaker indication from the calibration requirements of this surveillance. The associated ISTS SR 3.3.4.3 Bases do not contain information associated with these allowances. Therefore, information associated with the allowances has been added.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 5

ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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

INSTRUMENTATION

LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.5 — 3.3.3.11 The LOP DG start instrumentation for each function in Table 3.3-14 shall be OPERABLE.

Applicability — APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.1.2, "AC Sources - Shutdown."

ACTION:

ACTION A / ACTION C — a. With the number of OPERABLE channels one less than the Required Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated DG set made inoperable by the channel.

ACTION B / ACTION C — b. With the number of OPERABLE channels less than the Required Channels by more than one for voltage sensors or with the number of OPERABLE channels one less than the Required Channels for timers, restore all but one channel of voltage sensors and at least one timer for each function to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated DG set made inoperable by the channels.

ACTION Note — c. Separate entry is allowed for each function.

~~d. Enter applicable Actions of LCO 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," for Auxiliary Feedwater Loss of Power Start Instrumentation made inoperable by LOP DG Start Instrumentation.~~ A02

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1
SR 3.3.5.2
SR Note — 4.3.3.11.1 Each LOP DG Start Instrumentation channel shall be demonstrated OPERABLE by the performance of the ~~CHANNEL CHECK~~, CHANNEL CALIBRATION, and ~~CHANNEL FUNCTIONAL TEST~~ TADOT operations for the MODES and at the frequencies shown in Table 4.3-10. A03 A04

~~4.3.3.11.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each LOP DG Start Instrumentation function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels.~~ L01

Add SR 3.3.5.1 Note — A04

Table 3.3.5-1

TABLE 3.3-14

LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION

	FUNCTIONAL UNIT		APPLICABLE MODES OR CONDITIONS	REQUIRED CHANNELS	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
Function 1	1.	6.9 kv Shutdown Board - Loss of Voltage				
Function 1.a		a. Voltage Sensors	1, 2, 3, 4, #	3/Shutdown Board	5520	≥ 5331 volts and ≤ 5688 volts
Function 1.b		b. Diesel Generator Start and Load Shed Timer	1, 2, 3, 4, #	1/Shutdown Board	1.25 seconds	≥ 1.00 seconds and ≤ 1.50 seconds
Function 2	2.	6.9 kv Shutdown Board - Degraded Voltage				
Function 2.a		a. Voltage Sensors	1, 2, 3, 4, #	3/Shutdown Board	6456 volts	≥ 6403.5 volts and ≤ 6522.5 volts
Function 2.b		b. Diesel Generator Start and Load Shed Timer	1, 2, 3, 4, #	1/Shutdown Board	300 seconds	≥ 218.6 seconds and ≤ 370 seconds
Function 2.c		c. SI/Degraded Voltage Logic Enable Timer	1, 2, 3, 4	1/Shutdown Board	9.5 seconds	≥ 7.5 seconds and ≤ 11.5 seconds

---

Footnote a

When associated DG is required to be OPERABLE by LCO 3.8.1.2, “AC Sources - Shutdown.”

Table 3.3.5-1

TABLE 4.3-10

LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TADOT A04

In accordance with the Surveillance Frequency Control Program LA01

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION SR 3.3.5.2	~~CHANNEL FUNCTIONAL TEST~~ SR 3.3.5.1	MODES FOR WHICH SURVEILLANCE REQUIRED
Function 1	1. 6.9 kv Shutdown Board - Loss of Voltage				
Function 1.a	a. Voltage Sensors	N.A.	~~R~~	~~M~~	1, 2, 3, 4, #
Function 1.b	b. Diesel Generator Start and Load Shed Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4, #
Function 2	2. 6.9 kv Shutdown Board - Degraded Voltage				
Function 2.a	a. Voltage Sensors	N.A.	~~R~~	~~M~~	1, 2, 3, 4, #
Function 2.b	b. Diesel Generators Start and Load Shed Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4, #
Function 2.c	c. SI/Degraded Voltage Logic Enable Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4

In accordance with the Surveillance Frequency Control Program LA01

Footnote a # When associated DG is required to be OPERABLE by LCO 3.8.1.2, “AC Sources - Shutdown.”

ITS A01 ITS 3.3.5

INSTRUMENTATION

LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.5 3.3.3.11 The LOP DG start instrumentation for each function in Table 3.3-14 shall be OPERABLE.

Applicability APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.1.2, "AC Sources - Shutdown."

ACTION:

ACTION A a. With the number of OPERABLE channels one less than the Required Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours
ACTION C or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated DG set made inoperable by the channel.

ACTION B b. With the number of OPERABLE channels less than the Required Channels by more than one for voltage sensors or with the number of OPERABLE channels one less than the Required Channels for timers, restore all but one channel of voltage sensors and at least one timer for each function to OPERABLE status within 1 hour
ACTION C or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated DG set made inoperable by the channels.

ACTION Note c. Separate entry is allowed for each function.

~~d. Enter applicable Actions of LCO 3.3.2, "Engineered Safety Feature Actuation System Instrumentation," for Auxiliary Feedwater Loss of Power Start Instrumentation made inoperable by LOP DG Start Instrumentation.~~ A02

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1
SR 3.3.5.2 4.3.3.11.1 Each LOP DG Start Instrumentation channel shall be demonstrated OPERABLE by the performance of the ~~CHANNEL CHECK~~, CHANNEL CALIBRATION, and ~~CHANNEL FUNCTIONAL TEST~~ A03
SR Note operations for the MODES and at the frequencies shown in Table 4.3-10. TADOT A04

~~4.3.3.11.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each LOP DG Start Instrumentation function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels.~~ L01

Add SR 3.3.5.1 Note A04

Table 3.3.5-1

TABLE 3.3-14

LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION

	FUNCTIONAL UNIT	APPLICABLE MODES OR CONDITIONS	REQUIRED CHANNELS	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
Function 1	1. 6.9 kv Shutdown Board - Loss of Voltage				
Function 1.a	a. Voltage Sensors	1, 2, 3, 4, #	3/Shutdown Board	5520	≥ 5331 volts and ≤ 5688 volts
Function 1.b	b. Diesel Generator Start and Load Shed Timer	1, 2, 3, 4, #	1/Shutdown Board	1.25 seconds	≥ 1.00 seconds and ≤ 1.50 seconds
Function 2	2. 6.9 kv Shutdown Board - Degraded Voltage				
Function 2.a	a. Voltage Sensors	1, 2, 3, 4, #	3/Shutdown Board	6456 volts	≥ 6403.5 volts and ≤ 6522.5 volts
Function 2.b	b. Diesel Generator Start and Load Shed Timer	1, 2, 3, 4, #	1/Shutdown Board	300 seconds	≥ 218.6 seconds and ≤ 370 seconds
Function 2.c	c. SI/Degraded Voltage Logic Enable Timer	1, 2, 3, 4	1/Shutdown Board	9.5 seconds	≥ 7.5 seconds and ≤ 11.5 seconds

---

Footnote a # When associated DG is required to be OPERABLE by LCO 3.8.1.2, “AC Sources - Shutdown.”

ITS

A01

ITS 3.3.5

Table 3.3.5-1

TABLE 4.3-10

LOSS OF POWER DIESEL GENERATOR START INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TADOT

A04

In accordance with the Surveillance Frequency Control Program

LA01

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION SR 3.3.5.2	TADOT ~~CHANNEL FUNCTIONAL TEST~~ SR 3.3.5.1	MODES FOR WHICH SURVEILLANCE REQUIRED
Function 1	1. 6.9 kv Shutdown Board - Loss of Voltage				
Function 1.a	a. Voltage Sensors	N.A.	~~R~~	~~M~~	1, 2, 3, 4, #
Function 1.b	b. Diesel Generator Start and Load Shed Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4, #

In accordance with the Surveillance Frequency Control Program

LA01

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION SR 3.3.5.2	TADOT ~~CHANNEL FUNCTIONAL TEST~~ SR 3.3.5.1	MODES FOR WHICH SURVEILLANCE REQUIRED
Function 2	2 . 6.9 kv Shutdown Board - Degraded Voltage				
Function 2.a	a. Voltage Sensors	N.A.	~~R~~	~~M~~	1, 2, 3, 4, #
Function 2.b	b. Diesel Generators Start and Load Shed Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4, #
Function 2.c	c. SI/Degraded Voltage Logic Enable Timer	N.A.	~~R~~	N.A.	1, 2, 3, 4

Footnote a # When associated DG is required to be OPERABLE by LCO 3.8.1.2, “AC Sources - Shutdown.”

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.3.11 ACTION d requires entrance into the applicable ACTIONS of LCO 3.3.2 "Engineered Safety Feature Actuation System Instrumentation," for Auxiliary Feedwater Loss of Power Start Instrumentation which is made inoperable by LOP DG Start Instrumentation. ITS 3.3.5 does not contain this ACTION. This changes the CTS by not including the ACTION to enter the ACTIONS of LCO 3.3.2.

This change is acceptable because ITS 3.3.2 contains an ACTION to take for the Auxiliary Feedwater Loss of Offsite Power Start Instrumentation. Therefore, there is no reason to have a specific ACTION in ITS 3.3.5. This change is considered administrative because it does not result in a technical change to the CTS.

A03 CTS 4.3.3.11.1 requires, in part, that the LOP DG Start instrumentation in Table 4.3-10 be demonstrated OPERABLE by performance of a CHANNEL CHECK for the MODES and at the Frequencies shown in Table 4.3-10. ITS LCO 3.3.5 does not include a CHANNEL CHECK. This changes the CTS by deleting the reference to a CHANNEL CHECK surveillance requirement.

The purpose of CTS 4.3.3.11.1 is to provide the requirement for performance of those Surveillances listed in CTS Table 4.3-10. CTS 4.3.3.11.1 requires that each LOP DG Start Instrumentation channel be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations for the MODES and at the Frequencies shown in Table 4.3-10. CTS Table 4.3-10 does not contain any requirements to perform a CHANNEL CHECK for any of the listed Functions. ITS Table 3.3.5-1 contains the same instruments as CTS Table 4.3-10 and similarly does not contain any requirements to perform a CHANNEL CHECK. Because ITS Table 3.3.5-1 does not contain any requirements for performance of a CHANNEL CHECK reference to a CHANNEL CHECK is deleted. This change is considered administrative because it does not result in a technical change to the CTS.

A04 CTS 4.3.3.11.1 requires, in part, that the LOP DG Start instrumentation in Table 4.3-10 be demonstrated OPERABLE by performance of CHANNEL FUNCTIONAL TEST. CTS Table 4.3-10 Function 1.a (6.9 kV Shutdown Board – Loss of Voltage – Voltage Sensors) and Function 2.a (6.9 kV Shutdown Board –

Degraded Voltage – Voltage Sensors) require performance of a CHANNEL FUNCTIONAL TEST. ITS Table 3.3.5-1 Function 1.a (6.9 kV Shutdown Board – Loss of Voltage – Voltage Sensors) and Function 2.a (6.9 kV Shutdown Board – Degraded Voltage – Voltage Sensors) require performance of a TADOT. ITS SR 3.3.5.1, perform a TADOT, is modified by a Note that states that verification of relay setpoints is not required. This changes the CTS by requiring a TADOT without verification of relay setpoints instead of a CHANNEL FUNCTIONAL TEST.

This change is acceptable because the TADOT continues to perform a test similar to the current CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The TADOT provides a similar test with the addition that the TADOT includes adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. With the addition of the Note modifying ITS SR 3.3.5.1 to exclude the requirement to include an adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy the ITS SR 3.3.5.1 provides a similar surveillance as the CTS CHANNEL FUNCTION TEST. This change is considered administrative because it does not result in a technical change to the CTS

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS Table 4.3-10 Functional Unit 1.a requires a monthly CHANNEL FUNCTIONAL TEST and a refueling outage CHANNEL CALIBRATION for the 6.9 kV Shutdown Board – Loss of Voltage – Voltage Sensors. CTS Table 4.3-10 Functional Unit 1.b requires a refueling outage CHANNEL FUNCTIONAL TEST for the 6.9 kV Shutdown Board – Loss of Voltage – Diesel Generator Start and Load Shed Timer. CTS Table 4.3-10 Functional Unit 2.a requires a monthly CHANNEL FUNCTIONAL TEST and a refueling outage CHANNEL CALIBRATION for the 6.9 kV Shutdown Board – Degraded Voltage – Voltage Sensors. CTS Table 4.3-10 Functional Unit 2.b requires a refueling outage CHANNEL CALIBRATION for the 6.9 kV Shutdown Board – Degraded Voltage – Diesel Generator Start and Load Shed Timer. CTS Table 4.3-10 Functional Unit 2.c requires a refueling outage CHANNEL CALIBRATION for the 6.9 kV Shutdown Board – Degraded Voltage – SI/Degraded Logic Enable Timer. ITS SR 3.3.5.1 and SR 3.3.5.2 require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.3.3.11.2 requires a verification that the ENGINEERED SAFETY FEATURES RESPONSE TIME for each LOP DG Start Instrumentation function is within the limit at least once per 18 months. Additionally, it requires that each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels. ITS 3.3.5 does not require this Surveillance Requirement. This changes the CTS by not requiring the LOP DG Start instrumentation to have a verification of the ENGINEERED SAFETY FEATURE RESPONSE TIME.

The purpose of CTS 4.3.3.11.2 is to ensure that the actuation response time is less than or equal to the maximum value assumed in the accident analyses. This change is acceptable because 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. Therefore, the Surveillance Requirement is not necessary to verify the equipment used to meet the LCO can perform its required functions. This change is also acceptable because the equipment will continue to be tested in a manner and frequency necessary to give the confidence that the equipment can perform its assumed safety function. This change is designated as less restrictive because a Surveillance Requirement that was required in the CTS will no longer be required in the ITS.

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

3.3 INSTRUMENTATION

3.3.5A Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.11

LCO 3.3.5A ~~[Three] channels per bus of the loss of voltage Function and [three] channels per bus of the degraded voltage Function~~ The LOP DG start instrumentation for each Function in Table 3.3.5-1 shall be OPERABLE. ②

Applicability

APPLICABILITY: ~~MODES 1, 2, 3, and 4,~~ According to Table 3.3.5-1.
~~When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."~~ ②

ACTIONS

ACTION c

---NOTE---
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION a	A. One or more Functions with one voltage sensor channel ~~per bus~~ inoperable.	A.1 ~~-------------NOTE-------------~~ ~~The inoperable channel may be bypassed for up to [4] hours for surveillance testing of other channels.~~ ~~-----------------------------------~~ Restore the inoperable channel to OPERABLE status. ~~Place channel in trip.~~	~~[~~6~~]~~ hours	② ③
ACTION b	B. INSERT 1 ~~One or more Functions with two or more channels per bus inoperable.~~	B.1.1 Restore all but one voltage sensor channel ~~per bus~~ to OPERABLE status. INSERT 2	1 hour	② ②
ACTION a ACTION b	C. Required Action and associated Completion Time not met.	C.1 Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately	②

② **INSERT 1**

ACTION b One or more Functions with two or more voltage sensor channels inoperable.

OR

ACTION b One or more Functions with one required timer inoperable.

② **INSERT 2**

AND

B.1.2	Restore required timer to OPERABLE status.	1 hour

CTS

LOP DG Start Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.5~~A~~

SURVEILLANCE REQUIREMENTS INSERT 3 ②

SURVEILLANCE		FREQUENCY
~~SR 3.3.5.1~~	~~[Perform CHANNEL CHECK.~~	~~[12 hours~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~ ②
SR 3.3.5.~~2~~ 1	INSERT 4 Perform TADOT.	~~[[31] days~~ ~~OR~~ ② ④ ⑤ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑤
4.3.3.11.1 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~~ ~~OR~~ ⑤ In accordance with the Surveillance Frequency Control Program ~~]~~ ② ⑤

INSERT 5 ②

② INSERT 3

---NOTE---

4.3.3.11.1 Refer to Table 3.3.5-1 to determine which SRs apply for each LOP DG Start Instrumentation Function.

----

② INSERT 4

------------------------------NOTE---------------------------

DOC A04 Verification of relay setpoints not required.

----

② **INSERT 5**

Table 3.3.5-1 (page 1 of 1)
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Function 1	1. 6.9 kV Shutdown Board – Loss of Voltage					
Function 1.a	a. Voltage Sensors	1,2,3,4, (a)	3 per Shutdown Board	SR 3.3.5.1 SR 3.3.5.2	≥ 5331 V and ≤ 5688 V	5520 V
Function 1.b	b. Diesel Generator Start and Load Shed Timer	1,2,3,4, (a)	1 per Shutdown Board	SR 3.3.5.2	≥ 1.00 sec and ≤ 1.50 sec	1.25 sec
Function 2	2. 6.9 kV Shutdown Board – Degraded Voltage					
Function 2.a	a. Voltage Sensors	1,2,3,4, (a)	3 per Shutdown Board	SR 3.3.5.1 SR 3.3.5.2	≥ 6403.5 V and ≤ 6522.5 V	6456 V
Function 2.b	b. Diesel Generator Start and Load Shed Timer	1,2,3,4, (a)	1 per Shutdown Board	SR 3.3.5.2	≥ 218.6 sec and ≤ 370 sec	300 sec
Function 2.c	c. SI/Degraded Voltage Logic Enable Timer	1,2,3,4	1 per Shutdown Board	SR 3.3.5.2	≥ 7.5 sec and ≤ 11.5 sec	9.5 sec

Footnote # (a) When the associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

3.3 INSTRUMENTATION

3.3.5~~A~~ Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.11

The LOP DG start instrumentation for each Function in Table 3.3.5-1

LCO 3.3.5~~A~~ ~~[Three] channels per bus of the loss of voltage Function and [three] channels per bus of the degraded voltage Function~~ shall be OPERABLE. ②

Applicability

According to Table 3.3.5-1.

APPLICABILITY: ~~MODES 1, 2, 3, and 4,~~
~~When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."~~ ②

ACTIONS

ACTION c

---NOTE---
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION a A. One or more Functions with one voltage sensor channel ~~per bus~~ inoperable.	A.1 ~~-------------NOTE-------------~~ ~~The inoperable channel may be bypassed for up to [4] hours for surveillance testing of other channels.~~ ~~-----------------------------------~~ Restore the inoperable channel to OPERABLE status. ~~Place channel in trip.~~	~~[~~6~~]~~ hours ② ③
ACTION b B. INSERT 1 ~~One or more Functions with two or more channels per bus inoperable.~~	B.1.1 Restore all but one voltage sensor channel ~~per bus~~ to OPERABLE status. INSERT 2	1 hour ② ②
ACTION a ACTION b C. Required Action and associated Completion Time not met.	C.1 Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately ②

② **INSERT 1**

ACTION b One or more Functions with two or more voltage sensor channels inoperable.

OR

ACTION b One or more Functions with one required timer inoperable.

② **INSERT 2**

AND

B.1.2	Restore required timer to OPERABLE status.	1 hour

CTS

LOP DG Start Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.5~~A~~

SURVEILLANCE REQUIREMENTS INSERT 3 ②

SURVEILLANCE		FREQUENCY	
~~SR 3.3.5.1~~	~~[Perform CHANNEL CHECK.~~	~~[12 hours~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~	②
SR 3.3.5.~~2~~ 1	INSERT 4 Perform TADOT.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	④ ② ⑤ ⑤
4.3.3.11.1 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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ② ⑤

INSERT 5 ②

② INSERT 3

---NOTE---

4.3.3.11.1 Refer to Table 3.3.5-1 to determine which SRs apply for each LOP DG Start Instrumentation Function.

----

② INSERT 4

-----------------------------NOTE---------------------------

DOC A04 Verification of relay setpoints not required.

----

②

INSERT 5

Table 3.3.5-1 (page 1 of 1)
Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Function 1	1. 6.9 kV Shutdown Board – Loss of Voltage					
Function 1.a	a. Voltage Sensors	1,2,3,4, (a)	3 per Shutdown Board	SR 3.3.5.1 SR 3.3.5.2	≥ 5331 V and ≤ 5688 V	5520 V
Function 1.b	b. Diesel Generator Start and Load Shed Timer	1,2,3,4, (a)	1 per Shutdown Board	SR 3.3.5.2	≥ 1.00 sec and ≤ 1.50 sec	1.25 sec
Function 2	2. 6.9 kV Shutdown Board – Degraded Voltage					
Function 2.a	a. Voltage Sensors	1,2,3,4, (a)	3 per Shutdown Board	SR 3.3.5.1 SR 3.3.5.2	≥ 6403.5 V and ≤ 6522.5 V	6456 V
Function 2.b	b. Diesel Generator Start and Load Shed Timer	1,2,3,4, (a)	1 per Shutdown Board	SR 3.3.5.2	≥ 218.6 sec and ≤ 370 sec	300 sec
Function 2.c	c. SI/Degraded Voltage Logic Enable Timer	1,2,3,4	1 per Shutdown Board	SR 3.3.5.2	≥ 7.5 sec and ≤ 11.5 sec	9.5 sec

Footnote # (a) When the associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS 3.3.5B (with Setpoint Control Program Specification) is not used and is not shown.

2. ISTS 3.3.5 is written for LOP DG start instrumentation that contains a loss of voltage function and a degraded voltage function. ITS 3.3.5 is written for LOP DG start instrumentation that contains a loss of voltage function, a degraded voltage function, a load shed function and a DG start function that is consistent with the current licensing bases. As such, a Table (Table 3.3.5-1) was added and the Applicability, ACTIONS, and Surveillance Requirements were changed to reflect the current licensing bases and renumbered as appropriate.

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

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.

5. ISTS SR 3.3.5.2 and SR 3.3.5.3 (ITS SR 3.3.5.1 and SR 3.3.5.2, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

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

B 3.3 INSTRUMENTATION

B 3.3.5A Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation ~~(Without Setpoint Control Program)~~ ①

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 a 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~~ 6.9 kV ~~vital~~ Shutdown Board ~~bus~~. ②

~~Three undervoltage relays with inverse time characteristics~~ INSERT 1 ~~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 a 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 UFSAR, Section 8.3 (Ref. 1). 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.

Allowable Values and LOP DG Start Instrumentation Setpoints

~~-----------------------------------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.~~
~~--~~ ③

②

INSERT 1

Six undervoltage relays (two per phase) are provided on each 6.9 kV Shutdown Board for detecting a sustained degraded voltage condition or a loss of bus voltage. The relays are combined into two different two-out-of-three logic circuits; Loss of Voltage Function and Degraded Voltage Function. The Loss of Voltage Function (Function 1.a) logic generates a LOP signal if the voltage is below a nominal 80% for a short time while the Degraded Voltage Function (Function 2.a) logic generates a LOP signal if the voltage is below a nominal 93.5% for a longer time.

Six timers are provided on each 6.9 kV Shutdown Board, two timers associated with the Loss of Voltage Function logic and four timers associated with the Degraded Voltage Function logic. The two Loss of Voltage timers (Diesel Start and Load Shed Timers, Function 1.b) are arranged in a one-out-of-two logic with each timer set at a nominal 1.25 seconds. The Degraded Voltage timers are arranged in two sets of two; each set in a one-out-of–two logic. One set of Degraded Voltage timers (Diesel Start and Load Shed Timers, Function 2.b) are set at a nominal 300 seconds. The other set of Degraded Voltage timers (SI/Degraded Voltage Logic Enable Timers, Function 2.c) are set at a nominal 9.5 seconds. These timers along with the under voltage relays, ensure adequate voltage is available to the safety related loads and that unintended actuations from degraded voltage or voltage perturbations will not occur.

The Loss of Voltage Function voltage sensors monitor 6.9kV Shutdown Board voltage and actuate if voltage drops below 5520 volts. If two-out-of-three Loss of Voltage, Voltage Sensors detect less than 5520 volts, a signal is sent to the Diesel Generator Start and Load Shed Timers starting the 1.25 second timer. If Shutdown Board voltage increases to above the Loss of Voltage, Voltage Sensors setpoint before the Diesel Generator Start and Load Shed Timers reach their set time, the circuit returns to normal and the timers reset. If Shutdown Board voltage does not increase above the Loss of Voltage, Voltage Sensor setpoint within 1.25 seconds, a LOP signal is generated that trips the normal and alternate feeder breakers, starts the diesel generator, and trips major 6.9kV and 480V Shutdown Board loads.

The Degraded Voltage Function voltage sensors monitor 6.9kV Shutdown Board voltage and actuate if voltage drops below 6456 volts. If two-out-of-three Degraded Voltage, Voltage Sensors detect less than 6456 volts, a signal is sent to the Diesel Generator Start and Load Shed Timers starting their 300 second timer and to the SI/Degraded Voltage Logic Enable Timers starting their 9.5 second timer. If Shutdown Board voltage increases to above the Degraded Voltage, Voltage Sensors setpoint before the Diesel Generator Start and Load Shed Timers or the SI/Degraded Voltage Logic Enable Timers reach their set time, the circuit returns to normal and the timers reset. If Shutdown Board voltage does not increase above the Degraded Voltage, Voltage Sensor setpoint within 300 seconds a LOP signal is generated that trips the normal and alternate feeder breakers, starts the Diesel Generator, and trips major 6.9kV and 480V Shutdown Board loads. If Shutdown Board voltage does not increase above the Degraded Voltage, Voltage Sensor setpoint within 9.5 seconds and a safety injection signal is present or if a safety injection signal is generated after 9.5 seconds, a signal is generated that trips major 6.9kV and 480V Shutdown Board loads.

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. ②

the associated setpoint scaling document

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~~. Nominal Trip Setpoints are also specified in the unit specific setpoint calculations. 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 (Ref. ~~3~~). ④ ②

Table 3.3.5-1

s

2, 3, and 4

APPLICABLE SAFETY ANALYSES

The LOP 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 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. ②

5

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.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The LOP DG start instrumentation channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

, as required by Table 3.3.5-1

Functions

, as required by Table 3.3.5-1,

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. In MODES 5 and 6, the ~~[three] 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 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. ⑤ ④ ⑤ 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 LOP or degraded power to the ~~vital bus~~. associated 6.9 kV Shutdown Boards ②

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.~~
~~--~~ ③

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.

BASES

ACTIONS (continued)

shutdown board

Because the required channels are specified on a per ~~bus~~ basis, the Condition may be entered separately for each ~~bus~~ as appropriate. ④

shutdown board

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

or more Functions with one voltage sensor

Condition A applies to the LOP DG start Functions with one ~~loss of voltage or one degraded voltage~~ channel ~~per bus~~ inoperable. ④

of the voltage sensors

restored to OPERABLE status

If one channel is inoperable, Required Action A.1 requires that channel to be ~~placed in trip~~ within ~~[~~6~~]~~ hours. ~~With a channel in trip, the LOP DG start instrumentation channels are configured to provide a one-out-of-three logic to initiate a trip of the incoming offsite power.~~

~~A Note is added to allow bypassing an inoperable channel for up to [4] hours for surveillance testing of other channels. This allowance is made where bypassing the channel does not cause an actuation and where at least two other channels are monitoring that parameter.~~ ④

is

The specified Completion Time ~~and time allowed for bypassing one channel are~~ reasonable considering the Function remains fully OPERABLE ~~on every bus~~ and the low probability of an event occurring during these intervals. ④

B.1

one or more Functions have two or more voltage sensor channels inoperable

one or more Functions have one required timer

Condition B applies when ~~more than one loss of voltage~~ or ~~more than one degraded voltage channel per bus are~~ inoperable. ④

.1

voltage sensor

Required Action B.1 requires restoring all but one 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 a LOP start occurring during this interval. ④ ②

Required Action B.1.2 requires restoring the required load shed timer to OPERABLE status.

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 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 of 12 hours 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.~~

~~OR~~

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

④

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.5.~~2~~ 1 ④

SR 3.3.5.~~2~~ 1 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. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. INSERT 2 ~~For these tests, the relay trip setpoints are verified and adjusted as necessary.~~ ② There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of 31 days is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.~~ ⑥

~~OR~~

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

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

④

INSERT 2

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

2
SR 3.3.5.~~3~~ ④

2
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.

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of [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.~~ ⑥

~~OR~~

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

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

REFERENCES

U
1. FSAR, Section ~~[~~8.3~~]~~. ⑤ ②

5
~~2.~~ FSAR, Chapter ~~[~~15~~]~~.

2 INSERT 3
~~3~~. ~~Plant specific setpoint methodology study~~. ②

②

INSERT 3

TVA Calculation 27 DAT, “Demonstrated Accuracy Calculation 27 DAT."

3. TVA Calculation DS1-2, "Demonstrated Accuracy Calculation DS1-2."

4. TVA Calculation SQN-EEB-MS-TI06-0008, "Degraded Voltage Analysis."

B 3.3 INSTRUMENTATION

B 3.3.5~~A~~ Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation ~~(Without Setpoint Control Program)~~ ①

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 a 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~~ 6.9 kV ~~vital~~ Shutdown Board ~~bus~~. ②

~~Three undervoltage relays with inverse time characteristics~~ INSERT 1 ~~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 a 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 U FSAR, Section 8.3 (Ref. 1). 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.

<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.~~
~~--~~ ③

②

INSERT 1

Six undervoltage relays (two per phase) are provided on each 6.9 kV Shutdown Board for detecting a sustained degraded voltage condition or a loss of bus voltage. The relays are combined into two different two-out-of-three logic circuits; Loss of Voltage Function and Degraded Voltage Function. The Loss of Voltage Function (Function 1.a) logic generates a LOP signal if the voltage is below a nominal 80% for a short time while the Degraded Voltage Function (Function 2.a) logic generates a LOP signal if the voltage is below a nominal 93.5% for a longer time.

Six timers are provided on each 6.9 kV Shutdown Board, two timers associated with the Loss of Voltage Function logic and four timers associated with the Degraded Voltage Function logic. The two Loss of Voltage timers (Diesel Start and Load Shed Timers, Function 1.b) are arranged in a one-out-of-two logic with each timer set at a nominal 1.25 seconds. The Degraded Voltage timers are arranged in two sets of two; each set in a one-out-of–two logic. One set of Degraded Voltage timers (Diesel Start and Load Shed Timers, Function 2.b) are set at a nominal 300 seconds. The other set of Degraded Voltage timers (SI/Degraded Voltage Logic Enable Timers, Function 2.c) are set at a nominal 9.5 seconds. These timers along with the under voltage relays, ensure adequate voltage is available to the safety related loads and that unintended actuations from degraded voltage or voltage perturbations will not occur.

The Loss of Voltage Function voltage sensors monitor 6.9kV Shutdown Board voltage and actuate if voltage drops below 5520 volts. If two-out-of-three Loss of Voltage, Voltage Sensors detect less than 5520 volts, a signal is sent to the Diesel Generator Start and Load Shed Timers starting the 1.25 second timer. If Shutdown Board voltage increases to above the Loss of Voltage, Voltage Sensors setpoint before the Diesel Generator Start and Load Shed Timers reach their set time, the circuit returns to normal and the timers reset. If Shutdown Board voltage does not increase above the Loss of Voltage, Voltage Sensor setpoint within 1.25 seconds, a LOP signal is generated that trips the normal and alternate feeder breakers, starts the diesel generator, and trips major 6.9kV and 480V Shutdown Board loads.

The Degraded Voltage Function voltage sensors monitor 6.9kV Shutdown Board voltage and actuate if voltage drops below 6456 volts. If two-out-of-three Degraded Voltage, Voltage Sensors detect less than 6456 volts, a signal is sent to the Diesel Generator Start and Load Shed Timers starting their 300 second timer and to the SI/Degraded Voltage Logic Enable Timers starting their 9.5 second timer. If Shutdown Board voltage increases to above the Degraded Voltage, Voltage Sensors setpoint before the Diesel Generator Start and Load Shed Timers or the SI/Degraded Voltage Logic Enable Timers reach their set time, the circuit returns to normal and the timers reset. If Shutdown Board voltage does not increase above the Degraded Voltage, Voltage Sensor setpoint within 300 seconds a LOP signal is generated that trips the normal and alternate feeder breakers, starts the Diesel Generator, and trips major 6.9kV and 480V Shutdown Board loads. If Shutdown Board voltage does not increase above the Degraded Voltage, Voltage Sensor setpoint within 9.5 seconds and a safety injection signal is present or if a safety injection signal is generated after 9.5 seconds, a signal is generated that trips major 6.9kV and 480V Shutdown Board loads.

BASES

BACKGROUND (continued)

The Trip Setpoints used in the relays are based on the analytical limits presented in ~~FSAR,~~ the associated setpoint scaling document ~~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. ②

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~~ Table 3.3.5-1. Nominal Trip Setpoints are also specified in the unit specific setpoint calculations. 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 (Refs. ~~3~~ 2, 3, and 4). ④ ②

APPLICABLE SAFETY ANALYSES

The LOP 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 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~~ 5, in which a loss of offsite power is assumed. ②

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.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The LOP DG start instrumentation channels satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

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, as required by Table 3.3.5-1. In MODES 5 and 6, the ~~[three]~~ Functions ~~channels~~ must be OPERABLE, as required by Table 3.3.5-1, whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed. 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. ⑤ ④ ⑤ 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 LOP or degraded power to the ~~vital bus~~ associated 6.9 kV Shutdown Boards. ②

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.~~
~~--~~ ③

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.

ACTIONS (continued)

shutdown board

Because the required channels are specified on a per ~~bus~~ basis, the Condition may be entered separately for each ~~bus~~ as appropriate. ④

shutdown board

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

or more Functions with one voltage sensor

Condition A applies to the LOP DG start Functions with one ~~loss of voltage or one degraded voltage~~ channel ~~per bus~~ inoperable. ④

of the voltage sensors

restored to OPERABLE status

If one channel is inoperable, Required Action A.1 requires that channel to be ~~placed in trip~~ within ~~[~~6~~]~~ hours. ~~With a channel in trip, the LOP DG start instrumentation channels are configured to provide a one-out-of-three logic to initiate a trip of the incoming offsite power.~~ ④

~~A Note is added to allow bypassing an inoperable channel for up to [4] hours for surveillance testing of other channels. This allowance is made where bypassing the channel does not cause an actuation and where at least two other channels are monitoring that parameter.~~

is

The specified Completion Time ~~and time allowed for bypassing one channel are~~ reasonable considering the Function remains fully OPERABLE ~~on every bus~~ and the low probability of an event occurring during these intervals. ④

B.1

one or more Functions have two or more voltage sensor channels inoperable

one or more Functions have one required timer

Condition B applies when ~~more than one loss of voltage~~ or ~~more than one degraded voltage channel per bus are~~ inoperable. ④

.1

voltage sensor

Required Action B.1 requires restoring all but one 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 a LOP start occurring during this interval. ④ ②

Required Action B.1.2 requires restoring the required load shed timer to OPERABLE status.

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 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 of 12 hours 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.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.5.~~2~~ 1

SR 3.3.5.~~2~~ 1 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. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. INSERT 2 ~~For these tests, the relay trip setpoints are verified and adjusted as necessary.~~ There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ④ ②

~~[The Frequency of 31 days 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.~~

~~OR~~ ⑥

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

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

④

INSERT 2

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

2

SR 3.3.5.~~3~~ ④

2

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.

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of [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.~~ ⑥

~~OR~~

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

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

REFERENCES

1. U FSAR, Section ~~[~~8.3~~]~~. ② ⑤

5 ~~2.~~ FSAR, Chapter ~~[~~15~~]~~.

2 ~~3~~. ~~Plant specific setpoint methodology~~ INSERT 3 ~~study~~. ②

②

INSERT 3

TVA Calculation 27 DAT, “Demonstrated Accuracy Calculation 27 DAT."

3. TVA Calculation DS1-2, "Demonstrated Accuracy Calculation DS1-2."
4. TVA Calculation SQN-EEB-MS-TI06-0008, "Degraded Voltage Analysis."

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.5 BASES, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS B 3.3.6B (with Setpoint Control Program Specification) is not used and is not shown.

2. 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.

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

4. Changes are made to be consistent with changes made to the Specification

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

6. ISTS SR 3.3.5.2 and SR 3.3.5.3 (ITS SR 3.3.5.1 and SR 3.3.5.2, respectively) Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 6

ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

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

ITS A01 ITS 3.3.6

INSTRUMENTATION

Containment Ventilation Isolation A02

3/4.3.2 ~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

Containment Ventilation Isolation A02

LCO 3.3.6 3.3.2.1 ~~The Engineered Safety Feature Actuation System (ESFAS)~~ instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4~~. A03

Applicability APPLICABILITY: As shown in Table 3.3-3.

ACTION: Containment Ventilation Isolation A02

ACTION A a. With an ~~ESFAS~~ instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status ~~with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value~~. A03

ACTION A b. With an ~~ESFAS~~ instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3. Containment Ventilation Isolation A02

SURVEILLANCE REQUIREMENTS

Containment Ventilation Isolation A02

SR Note 4.3.2.1.1 Each ~~ESFAS~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-2. ACTUATION LOGIC TEST / COT / TADOT M01

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation. See ITS 3.3.2

A04

SR 3.3.6.8 4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3~~.

~~18 months on a STAGGERED TEST BASIS~~ A05

In accordance with the Surveillance Frequency Control Program LA01

Add proposed SR 3.3.6.8 Note L01

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-3 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION

LA02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
	b. Phase "B" Isolation					
	1) Manual	2	1**	2	1, 2, 3, 4	20
	2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	15
	3) Containment Pressure-High-High	4	2	3	1, 2, 3	18
	c. Containment Ventilation Isolation	~~2~~	~~1~~	2	1, 2, 3, 4	19
Function 1	1) Manual					
Function 2	2) Automatic Isolation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	15
Function 3	3) Containment Purge Air Exhaust Monitor Radioactivity-High	~~2~~	~~1~~	1	1, 2, 3, 4	19

See ITS 3.3.2

LA02

LA02

**Two switches must be operated simultaneously for actuation.

See ITS 3.3.2

Add proposed Function 4.

M02

TABLE 3.3-3 (Continued)

TABLE NOTATION

\# Trip function may be bypassed in this MODE below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint.

\## Trip function automatically blocked above P-11 and may be blocked below P11 when Safety Injection on Steam Line Pressure-Low is not blocked.

See ITS 3.3.2

Add proposed ACTIONS Note. A06

ACTION STATEMENTS

ACTION A

ACTION 15 - With the number of OPERABLE Channels ~~one~~ less than the Total Number of Channels, ~~be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.~~

L02

Add proposed Required Action A.1 L02

ACTION 16 - Deleted.

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

See ITS 3.3.2

ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition within 6 hours and the Minimum Channels OPERABLE requirement is met; one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1.

ACTION A

ACTION 19 - With less than the Minimum Channels OPERABLE, ~~operation may continue provided the containment purge supply and exhaust valves are maintained closed~~.

Add proposed Required Action A.1 M03

ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.3.2

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-4 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION TRIP SETPOINTS

A03

FUNCTIONAL UNIT	~~NOMINAL~~ TRIP SETPOINT	~~ALLOWABLE VALUES~~	
2. CONTAINMENT SPRAY			
a. Manual Initiation	Not Applicable	Not Applicable	See ITS 3.3.2
b. Automatic Actuation Logic	Not Applicable	Not Applicable	
c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig	
3. CONTAINMENT ISOLATION			
a. Phase "A" Isolation			
1. Manual	Not Applicable	Not Applicable	See ITS 3.3.2
2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable	
b. Phase "B" Isolation			
1. Manua1	Not Applicable	Not Applicable	See ITS 3.3.2
2. Automatic Actuation Logic	Not Applicable	Not Applicable	
3. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig	
c. Containment Ventilation Isolation			
Function 1 — 1. Manual	Not Applicable	~~Not Applicable~~	A03
Function 2 — 2. Automatic Isolation Logic	Not Applicable	~~Not Applicable~~	

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-4 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION TRIP SETPOINTS

A03

Function 3

FUNCTIONAL UNIT	~~NOMINAL~~ TRIP SETPOINT	~~ALLOWABLE VALUES~~
3. Containment Purge Air Exhaust Monitor Radioactivity-High	$\leq 8.5 \times 10^{-3}$ µCi/cc	~~$\leq 8.5 \times 10^{-3}$ µCi/cc~~
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥ 592.2 psig steam line pressure (Note 1)
e. Negative Steam Line Pressure Rate—High	100.0 psi (Note 2)	≤ 107.8 psi (Note 2)
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water level-- High-High	81% of narrow range instrument span each steam generator	≤ 81.7% of narrow range instrument span each steam generator
b. Automatic Actuation Logic	N.A.	N.A.

See ITS 3.3.2

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 4.3-2 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

ACTUATION LOGIC TEST / COT / TADOT

M01

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~	MODES FOR WHICH SURVEILLANCE IS REQUIRED
	CONTAINMENT ISOLATION				
	a. Phase "A" Isolation				
	1) Manual	N.A.	N.A.	R	1, 2, 3, 4
	2) From Safety Injection Automatic Actuation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
	b. Phase "B" Isolation				
	1) Manual	N.A.	N.A.	R	1, 2, 3, 4
	2) Automatic Actuation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
	3) Containment Pressure-- High-High	S	R	Q	1, 2, 3
	c. Containment Ventilation Isolation				
Function 1	1) Manual	N.A.	N.A.	~~R~~ SR 3.3.6.6	1, 2, 3, 4
Function 2	2) Automatic Isolation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.6.2	1, 2, 3, 4
Function 3	3) Containment Purge Air Exhaust Monitor Radio-activity-High	~~S~~ SR 3.3.6.1	~~R~~ SR 3.3.6.7	~~Q~~ SR 3.3.6.4	1, 2, 3, 4

See ITS 3.3.2

L03

~~92 days on a STAGGERED TEST BASIS~~

In accordance with the Surveillance Frequency Control Program

LA01

Add proposed SR 3.3.6.3 with a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ for ITS Table 3.3.6-1 Function 2

M04

Add proposed SR 3.3.6.5 with a of Frequency of ~~every 18 months~~ for ITS Table 3.3.6-1 Function 2

M04

In accordance with the Surveillance Frequency Control Program

LA01

Add proposed SR 3.3.6.6 Note

A07

TABLE 4 .3-2 (Continued)

TABLE NOTATION

In accordance with the Surveillance Frequency Control Program

~~92 days on a STAGGERED TEST BASIS~~

LA01

L03

SR 3.3.6.2 ~~(1) Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS.~~

(2) The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

See ITS 3.3.2

ITS A01 ITS 3.3.6

3/4.3.3 MONITORING INSTRUMENTATION

~~RADIATION MONITORING~~ Containment Ventilation Isolation INSTRUMENTATION

A02

LIMITING CONDITION FOR OPERATION

A02

LCO 3.3.6 3.3.3.1 The ~~radiation monitoring~~ Containment Ventilation Isolation instrumentation channels shown in Table 3.3-6 shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

A03

Applicability APPLICABILITY: As shown in Table 3.3-6.

ACTION:

M05

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

A02

ACTION A
ACTION B
b. With one or more ~~radiation monitoring~~ Containment Ventilation Isolation channels inoperable, take the ACTION shown in Table 3.3-6.

M06

c. ~~The provisions of Specification 3.0.3 are not applicable.~~

SURVEILLANCE REQUIREMENTS

A02

SR Note 4.3.3.1 Each ~~radiation monitoring~~ Containment Ventilation Isolation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ COT operations for the MODES and at the frequencies shown in Table 4.3-3.

M01

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-6

~~RADIATION MONITORING~~ INSTRUMENTATION

Containment Ventilation Isolation

A02

A03

LA03

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	~~ALARM/~~TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION	
1. AREA MONITOR						
a. Fuel Storage Pool Area	1	*	≤ 151 mR/hr	10^{-1} - 10^{4} mR/hr	26	See ITS 3.3.8
2. PROCESS MONITORS						
Function 3 a. Containment Purge Air	1	1, 2, 3, 4 ~~& 6~~ During movement of recently irradiated fuel assemblies within containment	≤ 8.5x 10^{-3} µCi/cc	~~10 - 10^{7} cpm~~	28	LA03 L04
b. Containment						See ITS 3.4.15
i. Deleted						
ii. Particulate Activity						
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27	
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29	See ITS 3.3.7

---

* With fuel in the storage pool or building — See ITS 3.3.8

** Equivalent to 1.0 x 10^{-5} µCi/cc. — See ITS 3.3.7

A01

Table 3.3.6-1

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

During movement of recently irradiated fuel assemblies within containment

L04

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (~~MODE 6~~) and 3.3.2.1 (MODES 1, 2, 3, and 4).

ACTION B

ACTION A

ACTION 29 - a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two channels inoperable, within 1 hour initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Or

place both trains in the recirculation mode of operation within one hour.

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, suspend core alterations and suspend movement of irradiated fuel assemblies.

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

See ITS 3.3.7

Table 3.3.6-1

TABLE 4.3-3

Containment Ventilation Isolation A02

~~RADIATION MONITORING INSTRUMENTATION~~ SURVEILLANCE REQUIREMENTS

COT M01

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~	MODES FOR WHICH SURVEILLANCE REQUIRED
1. AREA MONITOR				
a. Fuel Storage Pool Area	S	R	Q	*
2. PROCESS MONITORS				
a. Containment Purge Air Exhaust	~~S~~ SR 3.3.6.1	~~R~~ SR 3.3.6.7	~~Q~~ SR 3.3.6.4	1, 2, 3, 4 ~~& 6~~
b. Containment				
i. Deleted				
ii. Particulate Activity				
RCS Leakage Detection	S	R	Q	1, 2, 3, & 4
c. Control Room Isolation	S	R	Q	ALL MODES

See ITS 3.3.8

Function 3

During movement of recently irradiated fuel assemblies within containment L04

In accordance with the Surveillance Frequency Control Program LA01

See ITS 3.4.15

See ITS 3.3.7

*With fuel in the storage pool or building.

See ITS 3.3.8

In accordance with the Surveillance Frequency Control Program LA01

Add proposed SR 3.3.6.3 with a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ for ITS Table 3.3.6-1 Function 2 M04

Add proposed SR 3.3.6.5 with a of Frequency ~~every 18 months~~ for ITS Table 3.3.6-1 Function 2 M04

In accordance with the Surveillance Frequency Control Program LA01

REFUELING OPERATIONS

INSTRUMENTATION A02

3/4.9.9 CONTAINMENT VENTILATION ISOLATION ~~SYSTEM~~

LIMITING CONDITION FOR OPERATION

instrumentation A02

LCO 3.3.6 3.9.9 The Containment Ventilation isolation ~~system~~ shall be OPERABLE.

Applicability APPLICABILITY: During movement of irradiated fuel within the containment.

recently L04

ACTION:

instrumentation A02

ACTION B With the Containment Ventilation isolation ~~system~~ inoperable, close each of the Ventilation penetrations providing direct access from the containment atmosphere to the outside atmosphere. ~~The provisions of Specification 3.0.3 are not applicable.~~ M06

A02

~~92 days~~ for containment radiation monitors L05

In accordance with the Surveillance Frequency Control Program LA01

~~18 months~~ for manual initiation L05

SURVEILLANCE REQUIREMENTS

instrumentation

L06

SR 3.3.6.2, SR 3.3.6.4 4.9.9 The Containment Ventilation isolation ~~system~~ shall be demonstrated OPERABLE ~~within 100 hours prior to the start of~~ and at least once per ~~7 days~~ during movement of irradiated fuel within containment by verifying that Containment Ventilation isolation occurs on manual initiation and on a high radiation test signal from each of the containment radiation monitoring instrumentation channels.

See ITS 3.9.4

INSTRUMENTATION

Containment Ventilation Isolation A02

3/4.3.2 ~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

Containment Ventilation Isolation A02

LCO 3.3.6 3.3.2 ~~The Engineered Safety Feature Actuation System (ESFAS)~~ instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE ~~with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4~~. A03

Applicability APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Containment Ventilation Isolation A02

ACTION A a. With an ~~ESFAS~~ instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status ~~with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value~~. A03

ACTION A b. With an ~~ESFAS~~ instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

Containment Ventilation Isolation A02

SURVEILLANCE REQUIREMENTS

Containment Ventilation Isolation A02

SR Note 4.3.2.1.1 Each ~~ESFAS~~ instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-2.

ACTUATION LOGIC TEST / COT / TADOT M01

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

See ITS 3.3.2

A04

SR 3.3.6.8 4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3~~.

~~18 months on a STAGGERED TEST BASIS~~ A05

In accordance with the Surveillance Frequency Control Program LA01

Add proposed SR 3.3.6.8 Note L01

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-3 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION

LA02

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
	3. CONTAINMENT ISOLATION					
	b. Phase "B" Isolation					
	1) Manual	2	1**	2	1, 2, 3, 4	20
	2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	15
	3) Containment Pressure-High-High	4	2	3	1, 2, 3	18
	c. Containment Ventilation Isolation					
Function 1	1) Manual	~~2~~	~~1~~	2	1, 2, 3, 4	19
Function 2	2) Automatic Isolation Logic	~~2~~	~~1~~	2	1, 2, 3, 4	15
Function 3	3) Containment Purge Air Exhaust Monitor Radioactivity-High	~~2~~	~~1~~	1	1, 2, 3, 4	19

See ITS 3.3.2

LA02

** Two switches must be operated simultaneously for actuation.

See ITS 3.3.2

Add proposed Function 4.

M02

A01

TABLE 3.3-3 (Continued)

TABLE NOTATION

\# Trip function may be bypassed in this MODE below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint.

\## Trip function automatically blocked above P-11 and may be blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.

See ITS 3.3.2

Add proposed ACTIONS Note.

A06

ACTION STATEMENTS

ACTION A

ACTION 15 - With the number of OPERABLE Channels ~~one~~ less than the Total Number of Channels, ~~be in HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.~~

L02

Add proposed Required Action A.1

L02

ACTION 16 - Deleted.

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

See ITS 3.3.2

ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition within 6 hours and the Minimum Channels OPERABLE requirement is met; one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1.

ACTION A

ACTION 19 - With less than the Minimum Channels OPERABLE, ~~operation may continue provided the containment purge supply and exhaust valves are maintained closed~~.

Add proposed Required Action A.1

M03

ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

See ITS 3.3.2

September 14, 2006
Amendment Nos. 55, 132, 158, 174, 180, 192, 197, 203, 290, 300

ITS A01 ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-4 (Continued)

Containment Ventilation Isolation

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION TRIP SETPOINTS

A02

A03

	FUNCTIONAL UNIT	~~NOMINAL~~ TRIP SETPOINT	~~ALLOWABLE VALUES~~	
	2. CONTAINMENT SPRAY			See ITS 3.3.2
	a. Manual Initiation	Not Applicable	Not Applicable	
	b. Automatic Actuation Logic	Not Applicable	Not Applicable	
	c. Containment Pressure--High-High	2.81 psig	≤2.9 psig	
	3. CONTAINMENT ISOLATION			
	a. Phase "A" Isolation			See ITS 3.3.2
	1. Manual	Not Applicable	Not Applicable	
	2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable	
	b. Phase "B" Isolation			
	1. Manual	Not Applicable	Not Applicable	
	2. Automatic Actuation Logic	Not Applicable	Not Applicable	
	3. Containment Pressure--High-High	2.81 psig	≤2.9 psig	
	c. Containment Ventilation Isolation			
Function 1	1. Manual	Not Applicable	~~Not Applicable~~	A03
Function 2	2. Automatic Isolation Logic	Not Applicable	~~Not Applicable~~	

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-4 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION TRIP SETPOINTS

A03

Function 3

FUNCTIONAL UNIT	~~NOMINAL~~ TRIP SETPOINT	~~ALLOWABLE VALUES~~
3. Containment Purge Air Exhaust Monitor Radioactivity - High	≤8.5 x 10^{-3} µCi/cc	~~≤8.5 x 10^{-3} µCi/cc~~
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤2.9 psig
d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥592.2 psig steam line pressure (Note 1)
e. Negative Steam Line Pressure Rate--High	100.0 psi (Note 2)	≤107.8 psi (Note 2)
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water level --High-High	81% of narrow range instrument span each steam generator	≤81.7% of narrow range instrument span each steam generator
b. Automatic Actuation Logic	N.A.	N.A.

See ITS 3.3.2

ITS

A01

ITS 3.3.6

TABLE 4.3-2 (Continued)

Containment Ventilation Isolation

A02

~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

ACTUATION LOGIC TEST / COT / TADOT

M01

Table 3.3.6-1

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. CONTAINMENT ISOLATION				
a. Phase "A" Isolation				
1) Manual	N.A.	N.A.	R	1, 2, 3, 4
2) From Safety Injection Automatic Actuation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
b. Phase "B" Isolation				
1) Manual	N.A.	N.A.	R	1, 2, 3, 4
2) Automatic Actuation Logic	N.A.	N.A.	M(1)	1, 2, 3, 4
3) Containment Pressure--High-High	S	R	Q	1, 2, 3
c. Containment Ventilation Isolation				
Function 1 1) Manual	N.A.	N.A.	~~R~~ SR 3.3.6.6	1, 2, 3, 4
Function 2 2) Automatic Isolation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.6.2	1, 2, 3, 4
Function 3 3) Containment Purge Air Exhaust Monitor Radioactivity-High	~~S~~ SR 3.3.6.1	~~R~~ SR 3.3.6.7	~~Q~~ SR 3.3.6.4	1, 2, 3, 4

See ITS 3.3.2

L03

~~92 days on a STAGGERED TEST BASIS~~

In accordance with the Surveillance Frequency Control Program

LA01

Add proposed SR 3.3.6.3 with a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ for ITS Table 3.3.6-1 Function 2

M04

Add proposed SR 3.3.6.5 with a of Frequency ~~every 18 months~~ for ITS Table 3.3.6-1 Function 2

M04

In accordance with the Surveillance Frequency Control Program

LA01

Add proposed SR 3.3.6.6 Note

A07

TABLE 4.3-2 (Continued)
TABLE NOTATION

In accordance with the Surveillance Frequency Control Program LA01

~~92 days on a STAGGERED TEST BASIS~~ L03

SR 3.3.6.2 ~~(1) Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS.~~

(2) The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

See ITS 3.3.2

INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

~~RADIATION MONITORING~~ INSTRUMENTATION

Containment Ventilation Isolation A02

LIMITING CONDITION FOR OPERATION

Containment Ventilation Isolation A02

LCO 3.3.6 3.3.3.1 The ~~radiation monitoring~~ instrumentation channels shown in Table 3.3-6 shall be OPERABLE ~~with their alarm/trip setpoints within the specified limits~~.

A03

Applicability APPLICABILITY: As shown in Table 3.3-6.

ACTION:

M05

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable~~.

Containment Ventilation Isolation A02

ACTION A
ACTION B
b. With one or more ~~radiation monitoring~~ channels inoperable, take the ACTION shown in Table 3.3-6.

M06

~~c. The provisions of Specification 3.0.3 are not applicable.~~

SURVEILLANCE REQUIREMENTS

Containment Ventilation Isolation A02

SR Note 4.3.3.1 Each ~~radiation monitoring~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-3.

COT M01

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-6
~~RADIATION MONITORING~~ INSTRUMENTATION

Containment Ventilation Isolation

A02

A03

LA03

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	~~ALARM/~~TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION
1. AREA MONITOR					
a. Fuel Storage Pool Area	1	*	≤151 mR/hr	10^{-1} - 10^{4} mR/hr	26
2. PROCESS MONITORS					
a. Containment Purge Air	1	1, 2, 3, 4 ~~& 6~~	≤8.5 x 10^{-3} µCi/cc	~~10 - 10^{7} cpm~~	28
b. Containment					
i. Deleted					
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29

See ITS 3.3.8

Function 3

LA03

During movement of recently irradiated fuel assemblies within containment

L04

See ITS 3.4.15

See ITS 3.3.7

* With fuel in the storage pool or building

See ITS 3.3.8

** Equivalent to 1.0 x 10^{-5} µCi/cc.

See ITS 3.3.7

A01

Table 3.3.6-1

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

During movement of recently irradiated fuel assemblies within containment

L04

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (~~MODE 6~~) and 3.3.2 (MODES 1, 2, 3, and 4).

ACTION B

ACTION A

ACTION 29 -

a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two channels inoperable, within 1 hour initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Or

place both trains in the recirculation mode of operation within one hour.

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, suspend core alterations and suspend movement of irradiated fuel assemblies.

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

See ITS 3.3.7

ITS

A01

ITS 3.3.6

Table 3.3.6-1

TABLE 4.3-3

Containment Ventilation Isolation

A02

~~RADIATION MONITORING INSTRUMENTATION~~ SURVEILLANCE REQUIREMENTS

COT

M01

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~ COT	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. AREA MONITOR				
a. Fuel Storage Pool Area	S	R	Q	*
2. PROCESS MONITORS				
a. Containment Purge Air Exhaust	~~S~~ SR 3.3.6.1	~~R~~ SR 3.3.6.7	~~Q~~ SR 3.3.6.4	1, 2, 3, 4 ~~& 6~~
b. Containment				
i. Deleted				
ii. Particulate Activity				
RCS Leakage Detection	S	R	Q	1, 2, 3 & 4
c. Control Room Isolation	S	R	Q	ALL MODES

See ITS 3.3.8

Function 3

During movement of recently irradiated fuel assemblies within containment

L04

In accordance with the Surveillance Frequency Control Program

LA01

See ITS 3.4.15

See ITS 3.3.7

In accordance with the Surveillance Frequency Control Program

LA01

Add proposed SR 3.3.6.3 with a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ for ITS Table 3.3.6-1 Function 2

M04

Add proposed SR 3.3.6.5 with a of Frequency ~~every 18 months~~ for ITS Table 3.3.6-1 Function 2

M04

In accordance with the Surveillance Frequency Control Program

LA01

* With fuel in the storage pool or building.

See ITS 3.3.8

ITS

A01

ITS 3.3.6

REFUELING OPERATIONS

INSTRUMENTATION

A02

3/4.9.9 CONTAINMENT VENTILATION ISOLATION ~~SYSTEM~~

LIMITING CONDITION FOR OPERATION

instrumentation

A02

LCO 3.3.6

3.9.9 The Containment Ventilation Isolation ~~System~~ shall be OPERABLE.

Applicability

APPLICABILITY: During movement of irradiated fuel within the containment.

recently

L04

ACTION:

instrumentation

A02

ACTION B

With the Containment Ventilation Isolation ~~System~~ inoperable, close each of the Ventilation penetrations providing direct access from the containment atmosphere to the outside atmosphere. ~~The provisions of Specification 3.0.3 are not applicable.~~

M06

A02

~~92 days~~ for containment radiation monitors

L05

In accordance with the Surveillance Frequency Control Program

LA01

~~18 months~~ for manual initiation

L05

SURVEILLANCE REQUIREMENTS

instrumentation

L06

SR 3.3.6.2,
SR 3.3.6.4

4.9.9 The Containment Ventilation Isolation ~~System~~ shall be demonstrated OPERABLE ~~within 100 hours prior to the start of~~ and at least once per ~~7 days~~ during movement of irradiated fuel within containment by verifying that Containment Ventilation isolation occurs on manual initiation and on a high radiation test signal from each of the containment radiation monitoring instrumentation channels.

See ITS 3.9.4

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) require, in part, the Engineered Safety Features Actuation System (ESFAS) instrumentation to be OPERABLE. CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) ACTIONS a and b provide the compensatory actions to take when an ESFAS instrument is inoperable. CTS 4.3.2.1.1 provides the testing requirements for the ESFAS instrumentation. CTS Table 3.3-3 provides the Total No. of Channels, Channels to Trip, Minimum Channels OPERABLE, Applicable MODES, and ACTIONS for the ESFAS Functional Units. CTS Table 3.3-4 provides the Nominal Trip Setpoint and Allowable Values for the ESFAS Functional Units. CTS Table 4.3-2 provides the Surveillance Requirements for the ESFAS Functional Units. CTS 3.3.3.1 requires, in part, the Radiation Monitoring Instrumentation channels to be OPERABLE. CTS 3.3.3.1 ACTIONS a and b provide the Required Actions and associated Completion Time for when the Radiation Monitoring Instrumentation is inoperable. CTS 4.3.3.1 provides testing requirements for Radiation Monitoring Instrumentation. CTS Table 3.3-6 provides the Minimum Channels OPERABLE, Applicable MODES, Alarm/Trip Setpoint, Measurement Range, and ACTIONS for the Radiation Monitoring Instrumentation. CTS Table 4.3-3 provides the Surveillance Requirements for the Radiation Monitoring Instrumentation. CTS 3.9.9 provides the Limiting Condition for Operation requirements, ACTIONS, and Surveillance Requirements for the Containment Ventilation Isolation System. ITS LCO 3.3.6 requires, in part, that the Containment Ventilation Isolation instrumentation be OPERABLE. ITS Table 3.3.6-1 provides the Applicable MODES, Required Channels, Surveillance Requirements, and Trip Setpoints for Containment Ventilation Isolation Instrumentation. This changes the CTS by having a separate Specification for the Containment Ventilation Isolation Instrumentation in lieu of including it in the ESFAS Instrumentation and the Radiation Monitoring Instrumentation Specifications.

This change is acceptable because the technical requirements for the ESFAS Instrumentation and the Radiation Monitoring Instrumentation are maintained with the change in format. The Containment Ventilation Isolation Instrumentation continues to require the OPERABILITY of the ESFAS and Radiation Monitoring Instrumentation. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) require the ESFAS Instrumentation and interlock setpoints to be set consistent with the Nominal Trip Setpoint values shown in Table 3.3-4. CTS 3.3.3.1 requires the Radiation Monitoring Instrumentation channels to be set consistent with the Trip Setpoint values shown in Table 3.3-6. CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) ACTION a require the channel to be restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint. The Nominal Trip Setpoint and Allowable Values in CTS Table 3.3-4 Functional Unit 3.c.3 (Containment Purge Air Exhaust Monitor Radioactivity-High) and the Alarm/Trip Setpoint in CTS Table 3.3-6, Instrument 2.a (Containment Purge Air) indicate the same value. ITS 3.3.6 requires the Containment Ventilation Isolation Instrumentation Functions to be OPERABLE and specifies the Trip Setpoint for the Containment Ventilation Isolation Instrumentation Functions. ITS Table 3.3.6-1 Function 3 (Containment Purge Air Radiation Monitor) specifies a Trip Setpoint consistent with the values indicated in CTS Table 3.3-4, Function 3.c.3 and CTS Table 3.3-6 Instrument 2.a. This changes the CTS by indicating a Trip Setpoint instead of an Allowable Value or Nominal Trip Setpoint for the Containment Purge Air Radiation Monitor instrumentation.

The purpose of CTS 3.3.2.1 (Unit 1) and CTS 3.3.2 (Unit 2) Table 3.3-4, Functional Unit 3.c.3, and CTS 3.3.3.1 Table 3.3-6, Instrument 2.a is to establish the requirements for Containment Ventilation Isolation on a Containment Purge Air Radiation Monitor – High signal to maintain control room and offsite radiological doses below limits in the event of an accident. However, the trip setpoint for the Containment Purge Air Radiation Monitor instrumentation is not associated with an Analytical Limit assumed in the safety analysis that prevents violation of the Safety Limits from postulated Anticipated Operational Occurrences (AOOs). This change is acceptable since the channel will continue to be declared inoperable if the Trip Setpoint is found to be less conservative than the tolerance specified by the calibration procedure. This change is designated as administrative because it does not result in a technical change to the CTS.

A04 CTS 4.3.2.1.3 requires verification that the ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME of each ESFAS function is within limits. ITS Table 3.3.6-1 requires the performance of SR 3.3.6.8, "Verify ESF RESPONSE TIME is within limits," for Function 3 (Containment Purge Air Radiation Monitor). This changes the CTS by specifically stating the ESFAS Function that requires ESF RESPONSE TIME testing.

The purpose of CTS 4.3.2.1.3 is to ensure that the actuation response times are less than or equal to the maximum values assumed in the accident analysis. UFSAR Table 7.3.1-4 specifies response times for those ESF Functions assumed in the SQN safety analyses. Sequoyah License Amendment 190 and 182, for Unit 1 and Unit 2 respectively, relocated the ESFAS response time limits to the UFSAR (ADAMS Accession No. ML013300393). UFSAR Table 7.3.1-4 contains these limits listing the information in two columns, "Initiating Signal and Function," and "Response Time in Seconds." The Initiating Signals listed in UFSAR Table 7.3.1-4 includes Containment Purge Air Exhaust Radioactivity – High. This change is acceptable because ITS 3.3.6, Table 3.3.6-1 continues to require ESF RESPONSE TIME testing (ITS SR 3.3.6.8) for the Containment Ventilation Isolation, Containment Purge Air Exhaust Monitor Radioactivity-High as is delineated in UFSAR Table 7.3.1-4. This change is designated as administrative because it does not result in technical changes to the CTS.

A05 CTS 4.3.2.1.3 states, in part, that the ESF RESPONSE TIME of each ESFAS function shall be demonstrated to be within its limit at least once per 18 months. The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-3 ITS SR 3.3.6.8 requires the verification of ESF RESPONSE TIMES every 18 months "on a STAGGERED TEST BASIS." The ITS definition of STAGGERED TEST BASIS is consistent with the CTS testing Frequency. This changes the CTS by utilizing the ITS definition of STAGGERED TEST BASIS for the Frequency of the ESF RESPONSE TIME testing.

This change is acceptable because the requirements for ESF RESPONSE TIME testing for the ESFAS channels remain unchanged. The ITS definition of STAGGERED TEST BASIS and its application in this requirement do not change the current testing Frequency requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

A06 ITS 3.3.6 ACTIONS contains a Note which states that separate Condition entry is allowed for each Function. The ACTIONS for CTS 3.3.2.1 (Unit 1), CTS 3.3.2 (Unit 2), and CTS 3.3.3.1 do not contain this Note. This changes the CTS by specifically allowing separate Condition entry for each Function in ITS Table 3.3.6-1.

This change is acceptable because it clearly states the current requirement. The CTS considers each ESFAS and radiation monitoring instrument Function to be separate and independent. This change is designated as administrative because it does not result in a technical change to the CTS.

A07 CTS Table 4.3-2 requires a CHANNEL FUNCTIONAL TEST for Functional Unit c.1 (Manual). ITS Table 3.3.6-1 requires a similar test; ITS SR 3.3.6.6 (TADOT) to be performed for Function 1 (Manual Initiation) with the addition of a Note that states, "Verification of setpoint is not required." This changes the CTS by requiring a TADOT without setpoint verification instead of a CHANNEL FUNCTIONAL TEST.

CTS 1.6 states that for an analog channel a CHANNEL FUNCTIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions. ITS 1.1 defines a TADOT as consisting of operating the trip actuating device and verifying the OPERABILITY of all devices in the channel required for trip actuating device OPERABILITY. ITS further states that the TADOT shall include adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy. Because the TADOT includes adjustment, as necessary, of the trip actuating device so that it actuates at the required setpoint within the necessary accuracy, which is not included in the CTS CHANNEL FUNCTIONAL TEST, ITS SR 3.3.3.6 includes the Note, "Verification of setpoint is not required." A TADOT without setpoint verification provides a similar test for these channels as the CTS CHANNEL FUNCTIONAL TEST. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.3.2.1.1 requires, in part, that the ESFAS instrumentation on Table 4.3-2 be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST. Table 4.3-2 Functional Unit 3.c.1 (Containment Ventilation Isolation – Manual), Functional Unit 3.c.2 (Containment Ventilation Isolation – Automatic Isolation Logic), and Functional Unit 3.c.3 (Containment Ventilation Isolation – Containment Purge Air Exhaust Monitor Radioactivity-High) require a CHANNEL FUNCTIONAL TEST. CTS 4.3.3.1 requires, in part, that the Radiation Monitoring Instrumentation on Table 4.3-3 be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST. Table 4.3-3 Instrument 2.a (Process Monitors – Containment Purge Air) requires a CHANNEL FUNCTIONAL TEST. ITS Table 3.3.6-1 Function 1 (Manual Initiation) requires performance of a TADOT (SR 3.3.6.6). ITS Table 3.3.6-1 Function 2 (Automatic Actuation Logic and Actuation Relays) requires performance of an ACTUATION LOGIC TEST (SR 3.3.6.2). ITS Table 3.3.6-1 Function 3 (Containment Purge Air Radiation Monitor) requires performance of a COT (SR 3.3.6.4). This changes the CTS by requiring a TADOT, a COT, or ACTUATION LOGIC TEST instead of a CHANNEL FUNCTIONAL TEST.

This change is acceptable because the COT, TADOT, or ACTUATION LOGIC TEST continue to perform tests similar to the current CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The COT, TADOT, and ACTUATION LOGIC TEST provide similar tests with the addition that the COT and TADOT includes adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires additional acceptance criteria that is not currently required in the CTS.

M02 CTS Table 3.3-3 Functional Unit 3.c provides requirements for Containment Ventilation Isolation Functions, but does not explicitly provide requirements for the Safety Injection (SI) signal that results in closure of the containment purge supply and exhaust isolation valves. ITS 3.3.6, "Containment Ventilation

Isolation Instrumentation," provides requirements for the SI input from ESFAS Function (Function 4) to be OPERABLE in MODES 1, 2, 3, and 4. The proposed change provides a cross-reference to LCO 3.3.2, "ESFAS Instrumentation," Function 1, SI, for all requirements and functions, including ACTIONS and Surveillances. This changes the CTS by explicitly requiring the SI input from ESFAS Function for the Containment Ventilation Isolation instrumentation.

This change is acceptable because the SI input from ESFAS Function is required to support the OPERABILITY of the containment purge supply and exhaust isolation valves. As such, explicitly including requirements for the SI input from ESFAS Function in the Technical Specifications provides additional assurance that the OPERABILITY of the Containment Ventilation Isolation instrumentation will be maintained. The requirements for the Containment Ventilation Isolation instrumentation continue to require the isolation of the Containment Ventilation Isolation on Manual Initiation, Containment Purge Air Radiation, and SI input from ESFAS signals. This change is designated as more restrictive because it adds OPERABILITY requirements for the SI input from ESFAS Function to the CTS.

M03 CTS Table 3.3-3 ACTION 19 requires that when the Containment Ventilation Isolation – Manual channels are less than the Minimum Channels OPERABLE, that operation may continue provided the containment purge supply and exhaust valves are maintained closed. ITS 3.3.6 ACTION A requires, in part, when one or more Functions with one or more manual trains are inoperable to enter the applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge and exhaust isolation valves made inoperable by isolation instrumentation. This changes the CTS by requiring the ACTIONS of LCO 3.6.3 to be entered rather than maintaining the containment purge and supply valves in a closed position.

This change is acceptable because the containment purge and exhaust valves are considered containment isolation valves. Therefore, ITS LCO 3.6.3 will provide the appropriate compensatory actions to take when one or more Containment Ventilation Isolation – Manual channels are inoperable. This change is designated as more restrictive since the ITS provides additional requirements for an inoperable Containment Ventilation Isolation – Manual channel than were required in the CTS.

M04 CTS Table 4.3-2 Functional Unit 3.c.3 requires the Containment Ventilation Isolation – Containment Purge Air Exhaust Monitor Radioactivity – High channels to have a CHANNEL CHECK, a CHANNEL FUNCTIONAL TEST, and a CHANNEL CALIBRATION. CTS Table 4.3-3 Instrument 2.a requires the Process Monitors – Containment Purge Air Exhaust Monitor Radioactivity – High channels to have a CHANNEL CHECK, a CHANNEL FUNCTIONAL TEST, and a CHANNEL CALIBRATION. ITS 3.3.6 requires similar Surveillances, but also requires the performance of a MASTER RELAY TEST every 92 days on a STAGGERED TEST BASIS (ITS SR 3.3.6.3) and a SLAVE RELAY TEST every 18 months (ITS SR 3.3.6.5). (See DOC LA01 for the discussion on moving the Surveillance Frequencies to the Surveillance Frequency Control Program.) Additionally, ITS SR 3.3.6.3 contains a Note that states, that the Surveillance is only applicable to the master relays of the ESFAS Instrumentation. This changes the CTS by adding testing requirements for the master and slave relays.

This change is acceptable because the Automatic Actuation Logic and Actuation Relays Function is required to support the OPERABILITY of the Containment Ventilation Isolation Function. The addition of SR 3.3.6.3 (MASTER RELAY TEST) and SR 3.3.6.5 (SLAVE RELAY TEST) is acceptable since they will ensure the master and slave relays are able to perform their required safety function. This change is designated as more restrictive because it adds SRs for the Automatic Actuation Logic and Actuation Relays that were not included in the CTS.

M05 CTS 3.3.3.1 ACTION a requires that when a radiation monitor channel alarm/trip setpoint exceeds the value shown in Table 3.3.6, to adjust the setpoint within 4 hours or declare the channel inoperable. ITS 3.3.6 does not contain an ACTION for adjusting a setpoint that exceeds the required valued. Instead, ITS 3.3.6 ACTION B requires that when one required radiation monitoring channel is inoperable (i.e., setpoint not within tolerance) to enter the applicable Required Actions immediately. This changes the CTS by not allowing adjustment of the setpoint in 4 hours before declaring the channel inoperable.

The purpose of CTS 3.3.3.1 ACTION a is to allow adjustment of the radiation monitor setpoint to within limits before declare the channel inoperable. Although ITS does not include this allowance, restoration such that the LCO is met, is always an option. This change is acceptable because the channel requirements in ITS 3.3.6 will ensure that the required radiation monitoring channel is OPERABLE. The proposed ITS ACTION for when one channel is inoperable will ensure that the Required Actions and Completion Times used establish remedial measures that when taken minimize risk associated with continued operation. This change is designated as more restrictive because more stringent Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M06 CTS 3.3.3.1 ACTION c and CTS 3.9.9 ACTION state, in part, that the provisions of Specification 3.0.3 are not applicable for the Containment Purge Air Radiation Monitoring Instrumentation. ITS 3.3.6 does not contain this exception. This changes the CTS by eliminating an exception to LCO 3.0.3 from the requirements for the Containment Purge Air Radiation Monitoring Instrumentation.

The purpose of CTS 3.3.3.1 and CTS 3.9.9, in part, is to provide the requirements for Containment Purge Air Radiation Monitoring Instrumentation used to alert the operators and provide an input to effect a containment ventilation isolation actuation in the event of an accident. CTS 3.0.3 would require the unit be shut down when the requirements of the LCO and the associated ACTIONS are not satisfied. This change is acceptable because ITS 3.3.6 provides the appropriate LCO requirements and ACTIONS to take when the LCO is not met. If the LCO is not met and further unit operation under the specified ACTIONS is not permitted, it is appropriate to take the ACTIONS specified in LCO 3.0.3 to place the plant in a MODE in which the Specification does not apply. Eliminating the LCO 3.0.3 exemption ensures that the operators are provided guidance regarding actions to take in the event the required Radiation Monitoring Instrumentation is inoperable and the associated ACTIONS are not satisfied within the required Completion Time. This change is designated as more restrictive because an explicit exception to the requirements of LCO 3.0.3 is eliminated from the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.3.2.1.3 requires a RESPONSE TIME TEST every 18 months on a STAGGERED TEST BASIS for CTS Table 3.3-3 Functional Unit 3.c.3), Containment Ventilation Isolation – Containment Purge Air Exhaust Monitor Radioactivity – High. CTS Table 4.3-2 Functional Unit 3.c.1 requires a refueling outage CHANNEL FUNCTIONAL TEST for the Containment Ventilation Isolation – Manual channels. CTS Table 4.3-2 Functional Unit 3.c.2 requires a monthly CHANNEL FUNCTIONAL TEST for the Containment Ventilation Isolation – Automatic Isolation Logic channels. (See DOC L03 for the change of the Frequency from monthly on a STAGGERED TEST BASIS to 92 days on a STAGGERED TEST BASIS.) CTS Table 4.3-2 Functional Unit 3.c.3 requires that the Containment Ventilation Isolation – Containment Purge Air Exhaust Monitor Radioactivity – High channels have a CHANNEL CHECK every shift, a CHANNEL FUNCTIONAL TEST every quarter, and a CHANNEL CALIBRATION every refueling outage. CTS Table 4.3-3 Instrument 2.a requires that the Process Monitors – Containment Purge Air Exhaust channels have a CHANNEL CHECK every shift, a CHANNEL FUNCTIONAL TEST every quarter, and a CHANNEL CALIBRATION every refueling outage. CTS 4.9.9 requires a verification that Containment Ventilation Isolation occurs on a manual initiation and on a high radiation test signal from each of the containment radiation monitoring instrumentation channels within 100 hours prior to the start of and at least once per 7 days during the movement of irradiated fuel assemblies within containment. (See DOC L06 for discussion on the deletion of "within 100 hours prior to the start of movement of irradiated fuel within containment.") Additionally, ITS SR 3.3.6.3 has been added to require performance of a MASTER RELAY TEST at a Frequency of 92 days on a STAGGERED TEST BASIS and SR 3.3.6.5 has been added to require the performance of a SLAVE RELAY TEST at a Frequency of 18 months. (See DOC M04 for the discussion of adding SR 3.3.6.3 and SR 3.3.6.5.) ITS SR 3.3.6.1, SR 3.3.6.2, SR 3.3.6.3, SR 3.3.6.4, SR 3.3.6.5, SR 3.3.6.6, SR 3.3.6.7, and 3.3.6.8 require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for this SR and associated Bases to the Surveillance Frequency Control Program. (See DOC M01 for discussion on changing the CHANNEL FUNCTIONAL TEST to a COT/ACTUATION LOGIC TEST.)

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-3, "Engineered Safety Feature Actuation System Instrumentation," has three columns stating various requirements for the Containment Ventilation Isolation Manual, Automatic Isolation Logic, and Containment Purge Air Exhaust Monitor Radioactivity–High. These columns are labeled "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." ITS 3.3.6 does not include the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

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

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6, "Radiation Monitoring Instrumentation," includes a column providing the measurement range of the required instrumentation. This column is labeled "MEASUREMENT RANGE." ITS 3.3.6 does not include the "MEASUREMENT RANGE" column. This changes the CTS by moving the information of the "MEASUREMENT RANGE" column to the Bases.

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

LESS RESTRICTIVE CHANGES

L01 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.3.2.1.3 states, in part, that the ESF RESPONSE TIME of each ESFAS function shall be demonstrated to be within its limit at least once per 18 months. ITS SR 3.3.6.8 Note states that the radiation detectors are excluded from response time testing. This changes the CTS by excluding the radiation monitor from the ESF RESPONSE TIME testing for the Containment Ventilation Isolation High Radiation Function.

The purpose of CTS 4.3.2.1.3 is to ensure that the actuation response times are less than or equal to the maximum values assumed in the accident analysis. UFSAR Table 7.3.1-4 specifies response times and exceptions allowed for the Containment Ventilation Isolation Function initiated by the Containment Purge Air Exhaust Radioactivity –High signal. Sequoyah License Amendment 190 and 182, for Unit 1 and Unit 2 respectively, relocated the ESFAS response time limits to the UFSAR (ADAMS Accession No. ML013300393). UFSAR Table 7.3.1-4 contains these limits listing the information in two columns, "Initiating Signal and Function," and "Response Time in Seconds." The Initiating Signals listed in UFSAR Table 7.3.1-4 includes Containment Purge Air Exhaust Radioactivity – High for Function Containment Ventilation Isolation. The Response Time column in UFSAR Table 7.3.1-4 for Containment Ventilation Isolation is modified by Note (6). UFSAR Table 7.3.1-4 Note (6) states that the radiation detectors for Containment Ventilation Isolation Function may be excluded from Response Time Testing. This Note modifies the CTS definition of an ESF RESPONSE TIME test and was removed from CTS by License Amendment 190 and 182. ITS SR 3.3.6.8 is modified by a similar Note that excludes the radiation detector from ESF RESPONSE TIME testing. This change is acceptable because ITS 3.3.6, Table 3.3.6-1 retains the CTS intent of requiring ESF RESPONSE TIME testing (ITS SR 3.3.6.8) for those ESFAS Functions listed in UFSAR Table 7.3.1-4 as modified by the associated Table 7.3.1-4 Note. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-3 ACTION 15 requires that when one channel of Containment Ventilation Isolation – Automatic Isolation Logic (Functional Unit 3.c.2) is inoperable to be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours. Additionally, CTS Table 3.3-3 ACTION 15 allows one channel of the

Containment Ventilation Isolation – Automatic Isolation Logic to be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1, provided the other channel is OPERABLE. ITS 3.3.6 ACTION A requires, in part, that with one or more Containment Ventilation Isolation automatic actuation trains inoperable, to immediately enter the applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation. This changes the CTS by allowing continued unit operation when one or more Containment Ventilation Isolation – Automatic Isolation trains are inoperable.

The purpose of the CTS Table 3.3-3 ACTION 15 requirements is to ensure that the MODE of Applicability has been exited when the Automatic Isolation Logic is inoperable. This change is acceptable because the ITS 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 ITS Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. The proposed Required Action ensures that the function of the inoperable channel is satisfied by entering the applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation. The proposed change allows the Containment Isolation Valve Specification to ensure that the containment purge supply and exhaust isolation valves are in the correct position required for containment isolation. This change is designated as less restrictive because the less stringent requirements are being applied in the ITS than were applied in the CTS.

L03 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-2 Functional Unit 3.c.2 requires a CHANNEL FUNCTIONAL TEST of the Containment Ventilation Isolation – Automatic Actuation Logic every 62 days on a STAGGERED TEST BASIS (i.e., monthly), in MODES 1, 2, 3, and 4. ITS Table 3.3.6-1 Function 2, for Automatic Actuation Logic and Actuation Relays, requires performance of an ACTUATION LOGIC TEST (SR 3.3.6.2) every 92 days on a STAGGERED TEST BASIS. (See DOC M01 for discussion on the change from the CHANNEL FUNCTION TEST to the ACTUATION LOGIC TEST.) This changes the CTS by extending the testing requirements for the Containment Ventilation Isolation Automatic Actuation Logic and Actuation Relays from monthly to 92 days on a STAGGERED TEST BASIS.

The purpose of the CHANNEL FUNCTIONAL TEST/COT/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). TVA 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 Enclosure 4 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.

L04 *(Category 2 – Relaxation of Applicability)* CTS 3.3.3.1, CTS Table 3.3-6 Instrument 2.a, and CTS Table 4.3-3 Instrument 2.a require the Containment Purge Air Instrumentation to be OPERABLE, in part, in MODE 6. CTS 3.9.9 applies during the movement of irradiated fuel within the containment. CTS 4.9.9 requires that the containment ventilation isolation system shall be demonstrated OPERABLE during movement of irradiated fuel within containment by verifying that containment ventilation isolation occurs on manual initiation and on a high radiation test signal from each of the containment radiation monitoring instrumentation channels. ITS 3.3.6 Applicability, in part, is during the movement of recently irradiated fuel assemblies within containment. ITS 3.3.6 ACTION B applies during the movement of recently irradiated fuel assemblies in containment, and requires that when one or more Functions with one or more manual actuation trains inoperable or with one required radiation monitoring channel inoperable, to immediately place and maintain the containment purge supply and exhaust valves in the closed position, or immediately enter the Conditions and Required Actions of LCO 3.9.4 for containment purge and exhaust isolation valves made inoperable by isolation instrumentation. The ITS 3.3.6 Surveillance Requirements are required to be satisfied when ITS 3.3.6 is applicable. This changes the CTS Applicability from requiring the containment purge air process monitors to be OPERABLE in MODE 6, to an Applicability of during movement of recently irradiated fuel assemblies within containment.

The purpose of CTS 3.3.3.1 and CTS 3.9.9 are to provide assurance that the Containment Ventilation Isolation System can perform its required safety functions. This change in Applicability is acceptable because the requirements continue to ensure that the structures, system and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. TVA has performed a Fuel Handling Accident Radiological Accident Analysis for SQN using the alternate source term analysis methodology described in Regulatory Guide 1.183 obtaining acceptable results. The SQN fuel handling analysis assumes, in part, that the accident occurs within 100 hours after a plant shut down, radioactive decay during the interval between shut down and movement of the first spent fuel assembly is taken into account, and a single fuel assembly is damaged. As a result of the analysis, it has been determined that the handling of spent fuel assemblies can take place with the containment open and the Auxiliary Building Gas Treatment System out of service (i.e., no credit for filtration of releases) when handling fuel that has not occupied part of a critical reactor core within the previous 100 hours. The NRC approved use of this analysis for SQN under License Amendment 288/278 (Unit 1/Unit 2) (ADAMS Accession No. ML033070057). This change is designated as less restrictive because the LCO is applicable in fewer operating conditions under the ITS than under the CTS.

L05 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.9.9 includes a Surveillance Frequency of "once per 7 days" during conditions specified in the Applicability for performing Surveillances of the Containment Ventilation Isolation System on the manual initiation channels and the high radiation monitoring instrumentation channels. The ITS SR 3.3.6.4 requires the performance of a COT on the Containment Purge Air Radiation Monitoring Instrumentation, every 92 days. ITS SR 3.3.6.6 requires the performance of a TADOT on the manual initiation channels every 18 months. This changes the CTS by changing the Surveillance Frequency from 7 days to 92 days for the Containment Purge Air Radiation monitoring channels and 18 months for the manual initiation channels. (See DOC LA01 for a discussion on moving the Surveillance Frequencies to the Surveillance Frequency Control Program.)

The purpose of CTS 4.9.9 is to verify the equipment required to meet the LCO is OPERABLE. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Containment ventilation isolation instrumentation testing is still required, but at a Frequency consistent with the testing Frequency for containment isolation instrumentation required in CTS Table 4.3-2 and CTS Table 4.3-3. This Frequency provides an appropriate degree of assurance that the instruments are OPERABLE. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L06 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.9.9 states, in part, that the Containment Ventilation isolation system shall be demonstrated OPERABLE within 100 hours prior to the start of movement of irradiated fuel within containment. ITS SR 3.3.6.2 and ITS SR 3.3.6.4 do not include the Frequency of within 100 hours prior to the start of movement of irradiated fuel within containment. ITS SR 3.0.1 states "SRs shall be met during the MODES or other specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR." Therefore, the ITS requires the Surveillance be met prior to initiation of movement of recently irradiated fuel. (See DOC L04 for discussion on changing the Applicability from during movement of irradiated fuel to during movement of recently irradiated fuel.) This changes the CTS by eliminating the stipulation that the Surveillances be met within 100 hours prior to entering the conditions specified in the Applicability.

The purpose of CTS 4.9.9 is to verify that the Containment Ventilation Isolation System is OPERABLE. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The periodic Surveillance Frequency for verifying that Containment Ventilation isolation occurs is acceptable during the conditions specified in the Applicability, and is also acceptable during the period prior to entering the conditions specified in the Applicability. This change is designated as less restrictive because Surveillance will be performed less frequently under the ITS than under the CTS.

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

3.3 INSTRUMENTATION

3.3.6~~A~~ Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.2.1
3.3.3.1
3.9.9

LCO 3.3.6 The Containment ~~Purge and Exhaust~~ Ventilation Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE. ①

3.3.2.1 Applicability, 3.3.3.1 Applicability, 3.9.9 Applicability

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

DOC A06

---NOTE---
Separate Condition entry is allowed for each Function.

3.3.2.1 ACTION a, ACTION b; Table 3.3-3 ACTION 15, ACTION 19; Table 3.3-6 ACTION 28

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A.~~ ~~One radiation monitoring channel inoperable.~~	~~A.1~~ ~~Restore the affected channel to OPERABLE status.~~	~~4 hours~~ ②
~~B~~A. ------------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~~ One required radiation monitoring channel~~s~~ inoperable. ② ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	~~B~~A.1 Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation. ②	Immediately ②

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.6~~A~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-6 ACTION 28, 3.9.9 ACTION ~~C~~ B. ------------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~~ One required radiation monitoring channel~~s~~ inoperable. ~~OR~~ ~~Required Action and associated Completion Time for Condition A not met.~~	~~C~~ B.1 Place and maintain containment purge supply and exhaust valves in closed position. OR ~~C~~ B.2 Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately ② ③ Immediately ② ② ②

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ ①

SURVEILLANCE REQUIREMENTS

4.3.2.1.1, 4.3.3.1

-----NOTE-----
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment ~~Purge and Exhaust~~ Ventilation Isolation Function. ①

Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a

SURVEILLANCE	FREQUENCY
SR 3.3.6.1 Perform CHANNEL CHECK.	~~[12 hours~~ ④ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ④
~~SR 3.3.6.2 Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤
~~SR 3.3.6.3 Perform MASTER RELAY TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
~~-------------------------------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.~~ ~~--~~			⑥
Table 4.3-2 Function 3.c.2 ~~[~~SR 3.3.6.~~4~~ 2	------------------------------NOTE------------------------------ This Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. --		③ ⑤
	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS]~~ ~~OR~~	④
		In accordance with the Surveillance Frequency Control Program ~~]~~	④

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.6~~A~~

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.~~ ~~--~~			⑥
DOC M04	~~[~~SR 3.3.6.~~5~~ 3	------------------------------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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	③ ⑤ ④ ④ ③
Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a, 4.9.9	SR 3.3.6.~~6~~ 4	Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.6~~A~~

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M04	SR 3.3.6.~~7~~ 5	Perform SLAVE RELAY TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
DOC A07 Table 4.3-2 Function 3.c.1, 4.9.9	SR 3.3.6.~~8~~ 6	-----NOTE----- Verification of setpoint is not required. ----- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a	SR 3.3.6.~~9~~ 7	Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

INSERT 1 ②

② **INSERT 1**

4.3.2.1.3 DOC L01	SR 3.3.6.8	-----------------------------NOTE------------------------------ Radiation detectors are excluded from response time testing. --- Verify ESF RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.6~~A~~

Table 3.3.6-1 (page 1 of 1)
Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ①

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.1	1. Manual Initiation	1,2,3,4, (a)	2	SR 3.3.6.~~8~~ 6	NA	⑤
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.2	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.~~4]~~ 2 ~~[~~SR 3.3.6.~~5]~~ 3 SR 3.3.6.~~7~~ 5	NA	⑤
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.3, and Table 3.3-6 Instrument 2.a	3. ~~[~~ Containment Purge Air Radiation Monitor					
	~~a. Gaseous~~	1,2,3,4~~, (a)~~	~~[~~1~~]~~	SR 3.3.6.1 SR 3.3.6.~~6~~ 4 SR 3.3.6.~~9~~ 7 SR 3.3.6.8	≤ ~~[2 x background]~~ 8.5 x 10^{-3} μCi/cc	⑤
	INSERT 2					
	~~b. Particulate~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]~~	③
	~~c. Iodine~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]~~	
	~~d. Area Radiation~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]]~~	
DOC M02	4. ~~Containment Isolation - Phase A~~ Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function ~~3.a~~ 1., for all initiation functions and requirements.				②

(a) During movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. ③

③ **INSERT 2**

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
	(a)	1	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	$\leq 8.5 \times 10^{-3}$ µCi/cc

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.6~~A~~

3.3 INSTRUMENTATION

3.3.6~~A~~ Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.2
3.3.1
3.9.9

LCO 3.3.6 The Containment ~~Purge and Exhaust~~ Ventilation Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE. ①

3.3.2 Applicability, 3.3.1 Applicability, 3.9.9 Applicability

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

---NOTE---

DOC A06

Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A.~~ ~~One radiation monitoring channel inoperable.~~	~~A.1~~ ~~Restore the affected channel to OPERABLE status.~~	~~4 hours~~ ②
~~B~~A. ------------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~~ One required radiation monitoring channel~~s~~ inoperable. ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	~~B~~A.1 Enter applicable Conditions and Required Actions of LCO 3.6.3, "Containment Isolation Valves," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately

3.3.2 ACTION a, ACTION b; Table 3.3-3 ACTION 15, ACTION 19; Table 3.3-6 ACTION 28

② ② ②

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ ①

ACTIONS (continued)

Table 3.3-6 ACTION 28, 3.9.9 ACTION

CONDITION	REQUIRED ACTION		COMPLETION TIME
~~C~~ B. ------------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~~ One required radiation monitoring channel~~s~~ inoperable. ~~OR~~ ~~Required Action and associated Completion Time for Condition A not met.~~	~~C~~ B.1	Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
	OR		
	~~C~~ B.2	Enter applicable Conditions and Required Actions of LCO 3.9.4, "Containment Penetrations," for containment purge supply and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately

② ③ ② ② ②

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.6~~A~~

SURVEILLANCE REQUIREMENTS

---NOTE---

4.3.2.1.1, 4.3.3.1

Refer to Table 3.3.6-1 to determine which SRs apply for each Containment ~~Purge and Exhaust~~ Ventilation Isolation Function. ①

	SURVEILLANCE		FREQUENCY
Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a	SR 3.3.6.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ ④ In accordance with the Surveillance Frequency Control Program ~~]~~ ④
	~~SR 3.3.6.2~~	~~Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤
	~~SR 3.3.6.3~~	~~Perform MASTER RELAY TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ ①

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
~~-----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.~~ ~~-----~~ ⑥		
Table 4.3-2 Function 3.c.2 ~~[~~SR 3.3.6.~~4~~ 2	------NOTE------ This Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. ------ ③ ⑤ Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS]~~ ④ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~ ④

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.6~~A~~

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.~~ ~~--------~~		⑥
DOC M04	~~[~~SR 3.3.6.~~5~~ 3 --------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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	③ ⑤ ④ ④ ③
Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a, 4.9.9	SR 3.3.6.~~6~~ 4 Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.6~~A~~

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
DOC M04	SR 3.3.6.~~7~~ 5	Perform SLAVE RELAY TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
DOC A07 Table 4.3-2 Function 3.c.1, 4.9.9	SR 3.3.6.~~8~~ 6	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a	SR 3.3.6.~~9~~ 7	Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

INSERT 1 ②

② INSERT 1

4.3.2.1.3 DOC L01	SR 3.3.6.8	------------------------------NOTE------------------------------ Radiation detectors are excluded from response time testing. -- Verify ESF RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ ①

Table 3.3.6-1 (page 1 of 1)
Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ①

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.1	1. Manual Initiation	1,2,3,4, (a)	2	SR 3.3.6.~~8~~ 6	NA	⑤
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.2	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.~~4~~ 2~~]~~ ~~[~~SR 3.3.6.~~5~~ 3~~]~~ SR 3.3.6.~~7~~ 5	NA	⑤
Tables 3.3-3, 4.3-2, and 3.3-4, Function 3.c.3, and Table 3.3-6 Instrument 2.a	3. ~~[~~ Containment Purge Air Radiation Monitor					⑤ ③
	~~a. Gaseous~~	1,2,3,4~~, (a)~~	~~[~~1~~]~~	SR 3.3.6.1 SR 3.3.6.~~6~~ 4 SR 3.3.6.~~9~~ 7 SR 3.3.6.8	≤ ~~[2 x background]~~ 8.5 x 10^{-3} μCi/cc	
	INSERT 2					
	~~b. Particulate~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]~~	
	~~c. Iodine~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]~~	
	~~d. Area Radiation~~	~~1,2,3,4, (a)~~	~~[1]~~	~~SR 3.3.6.1~~ ~~SR 3.3.6.6~~ ~~SR 3.3.6.9~~	~~≤ [2 x background]]~~	
DOC M02	4. ~~Containment Isolation - Phase A~~ Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function ~~3.a~~ 1., for all initiation functions and requirements.				②

(a) During movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. ③

③ INSERT 2

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
	(a)	1	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	≤ 8.5 x 10^{-3} µCi/cc

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS 3.3.6B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Containment Purge and Exhaust Isolation Instrumentation" to " Containment Ventilation Isolation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have a Containment Purge and Exhaust Isolation Instrumentation.

2. 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.

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

4. ISTS SR 3.3.6.1, SR 3.3.6.4, SR 3.3.6.5, SR 3.3.6.6, SR 3.3.6.7, SR 3.3.6.8 and SR 3.3.6.9 (ITS SR 3.3.6.1, SR 3.3.6.2, SR 3.3.6.3, SR 3.3.6.4, SR 3.3.6.5, SR 3.3.6.6, and SR 3.3.6.7, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

5. The ACTUATION LOGIC TEST and MASTER RELAY TEST for SQN are processed through the Solid State Protection System. Since ISTS SR 3.3.6.4 and ISTS SR 3.3.6.5 are the appropriate Surveillances for the ACTUATION LOGIC TEST and MASTER RELAY TEST when they are processed through the Solid State Protection System, ISTS SR 3.3.6.2 and SR 3.3.6.3 have been deleted and the subsequent Surveillance Requirements have been renumbered.

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

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

B 3.3 INSTRUMENTATION

B 3.3.6A Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

Containment ~~purge and exhaust~~ Ventilation isolation instrumentation closes the containment isolation valves in the ~~Mini Purge System and the Shutdown~~ Containment Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The ~~Mini~~ Containment Purge System may be in use during reactor operation and ~~the Shutdown Purge System will be in use~~ with the reactor shutdown. ① ② ②

Containment ~~purge and exhaust~~ Ventilation 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 of SI signals. ① ②

~~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.~~ ②

~~Each of the~~ The containment purge system~~s~~ 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~~ ventilation isolation, which closes both inner and outer containment isolation valves in the ~~Mini Purge System and the Shutdown~~ Containment Purge System. Th~~ese~~is system~~s~~ ~~are~~ is described in the Bases for LCO 3.6.3, "Containment Isolation Valves." ②

APPLICABLE SAFETY ANALYSES

The safety analyses assume that the containment remains intact with containment purge ~~penetrations unnecessary for core cooling~~ isolated early in the event, within approximately ~~60~~ 300 seconds. ~~The isolation of the purge valves has not been analyzed mechanistically in the dose calculations, although its~~ ②

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~rapid isolation is assumed.~~ The containment ~~purge and exhaust~~ ventilation isolation radiation monitors, in addition ~~act as backup~~ to the SI signal, ~~to~~ ensure closing of the containment purge supply 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 (10 CFR 50.67 limits for a fuel handling accident). ~~[~~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~~ 100 hours).~~]~~ ① ② ② ② ③ ③

The containment ~~purge and exhaust~~ ventilation isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment ~~Purge and Exhaust~~ Ventilation Isolation, listed in Table 3.3.6-1, is OPERABLE. ①

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate Containment ~~Purge~~ Ventilation Isolation at any time by using INSERT 1 ~~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. ① ②

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~~ selector switch and the interconnecting wiring to the actuation logic cabinet. ②

2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

② **INSERT 1**

one of three sets of manual initiation switches in the control room. Either of the two Phase A and Containment Ventilation Isolation switches (HS-30-63A and HS-30-63B) or, both Phase B and Containment Ventilation Isolation switches (HS-30-64A and HS-30-64B), or both Phase B Containment Isolation switches (HS-30-68A and HS-30-68B), will actuate both trains of CVI.

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~~ ventilation isolation portion of ~~these Functions are~~ the SI Function is different and less restrictive than those for the~~ir Phase A isolation and~~ SI role~~s~~. If one or more of the SI ~~or Phase A isolation~~ Functions becomes inoperable in such a manner that only the Containment ~~Purge~~ Ventilation Isolation Function is affected, the Conditions applicable to the~~ir~~ SI ~~and Phase A isolation~~ Functions need not be entered. The less restrictive Actions specified for inoperability of the Containment ~~Purge~~ Ventilation Isolation Functions specify sufficient compensatory measures for this case. ②

3. Containment Radiation

The LCO specifies ~~four~~ one required channel~~s~~ of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment ~~Purge~~ Ventilation Isolation remains OPERABLE. ② ②

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY ~~may~~ also requires correct valve lineup~~s,~~ and 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. ②

4. ~~Containment Isolation - Phase A~~ Safety Injection (SI)

Refer to LCO 3.3.2, Function ~~3.a~~ 1., for all initiating Functions and requirements. ④

APPLICABILITY

The Manual Initiation, Automatic Actuation Logic and Actuation Relays, ~~Containment Isolation - Phase A~~ Safety Injection, 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~~ 100 hours)~~]~~ within containment. Under these conditions, the potential exists for an accident that could release significant fission product radioactivity into containment. Therefore, the containment ~~purge and exhaust~~ Ventilation isolation instrumentation must be OPERABLE in these MODES. ④ ③ ①

INSERT 2 ④

② **INSERT 2**

Since the movement of recently irradiated fuel assemblies in containment can only occur in MODE 6 or with the unit defueled, only one Containment Purge Air Radiation Monitor is required to be OPERABLE during the movement of recently irradiated fuel assemblies in containment.

BASES

APPLICABILITY (continued)

While in MODES 5 and 6 without fuel handling in progress, the containment ~~purge and exhaust~~ ventilation 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. ①

The Applicability for the containment ~~purge and exhaust~~ ventilation isolation on the ESFAS ~~Containment Isolation-Phase A~~ 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~~ Safety Injection Function Applicability. ① ④ ④

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. ②

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 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.~~ ④

BASES

ACTIONS (continued)

~~B~~A.1 ④

Condition ~~B~~ A applies to all Containment ~~Purge and Exhaust~~ Ventilation Isolation Functions and addresses the train orientation of the Solid State Protection System (SSPS) and the 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~~. ④ ① ④

If a train is inoperable~~,~~ or 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. ④

A Note is added stating that Condition ~~B~~ A is only applicable in MODE 1, 2, 3, or 4. ④

~~C~~B.1 and ~~C~~B.2 ④

Condition ~~C~~ B applies to all Containment ~~Purge and Exhaust~~ Ventilation Isolation Functions and addresses the train orientation of the SSPS and the master and slave relays for these Functions. It also addresses the failure of ~~multiple~~ the single required radiation monitoring channel~~s, 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~~ or the required radiation monitoring channel is 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~~ ventilation isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately. ④ ① ④ ①

A Note states that Condition ~~C~~ B is applicable during movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. ④ ③

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~~ Ventilation Isolation Functions. ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 months 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.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~ ⑥
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.6.2~~

~~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.~~

~~OR~~

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

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

~~SR 3.3.6.3~~

~~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.~~

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~ ④

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

~~[~~ SR 3.3.6.~~4~~2 ③ ④

SR 3.3.6.~~4~~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 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 2.~~

~~OR~~ ⑤

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

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~~3 ④

SR 3.3.6.~~5~~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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~

~~OR~~ ⑤

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑥

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the EFAS Instrumentation. ~~]~~ ③

SR 3.3.6.~~6~~4 ④

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. ~~[The Frequency of 92 days is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 3).~~

~~OR~~ ⑤

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑥

BASES

SURVEILLANCE REQUIREMENTS (continued)

This test verifies the capability of the instrumentation to provide the containment ~~purge and exhaust~~ ventilation system isolation. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ①

SR 3.3.6.~~7~~5 ④

SR 3.3.6.~~7~~5 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. ~~[The Frequency of 92 days is acceptable based on instrument reliability and industry operating experience.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑥
~~---]~~

SR 3.3.6.~~8~~6 ④

SR 3.3.6.~~8~~6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions. 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 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. ②

[~~The Frequency of 18 months is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---~~] ⑥

SR 3.3.6.~~9~~7 ④

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

[~~The Frequency of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑤

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑥

INSERT 3 ②

REFERENCES

1. 10 CFR 100.11.
2. ~~WCAP-15376, Rev. 0, October 2000.~~ UFSAR Table 7.3.1-4 ②
3. ~~NUREG-1366, [date].~~ WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995 ②

②

INSERT 3

SR 3.3.6.8

This SR ensures the individual channel 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 Updated Final Safety Analysis Report, Table 7.3.1-4 (Ref. 2). 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 to the point at which the equipment in both trains reaches the required functional state (e.g., valves in full open or closed position).

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 signal processing and actuation logic response times with actual response time tests on the remainder of the channel.

WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 3) 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 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.

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

SR 3.3.6.8 is modified by a Note stating that radiation detectors are excluded from response time testing.

B 3.3 INSTRUMENTATION

B 3.3.6A Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

Containment ~~purge and exhaust~~ Ventilation isolation instrumentation closes the containment isolation valves in the ~~Mini Purge System and the Shutdown~~ Containment Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The ~~Mini~~ Containment Purge System may be in use during reactor operation and ~~the Shutdown Purge System will be in use~~ with the reactor shutdown. ① ② ②

Containment ~~purge and exhaust~~ Ventilation 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 of SI signals. ① ②

~~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.~~ ②

~~Each of the~~ The containment purge system~~s~~ 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~~ ventilation isolation, which closes both inner and outer containment isolation valves in the ~~Mini Purge System and the Shutdown~~ Containment Purge System. Th~~ese~~is system~~s~~ ~~are~~ is described in the Bases for LCO 3.6.3, "Containment Isolation Valves." ②

APPLICABLE SAFETY ANALYSES

The safety analyses assume that the containment remains intact with ~~penetrations unnecessary for core cooling~~ containment purge isolated early in the event, within approximately ~~60~~ 300 seconds. ~~The isolation of the purge valves has not been analyzed mechanistically in the dose calculations, although its~~ ②

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~rapid isolation is assumed.~~ The containment ~~purge and exhaust~~ ventilation isolation radiation monitors, in addition ~~act as backup~~ to the SI signal, ~~to~~ ensure closing of the containment purge supply 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 (10 CFR 50.67 limits for a fuel handling accident). ~~[~~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~~ 100 hours).~~]~~ ① ② ② ② ③ ③

The containment ~~purge and exhaust~~ ventilation isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment ~~Purge and Exhaust~~ Ventilation Isolation, listed in Table 3.3.6-1, is OPERABLE. ①

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate Containment ~~Purge~~ Ventilation Isolation at any time by using ~~either of two switches in the control room. Either switch actuates both trains.~~ INSERT 1 This action will cause actuation of all components in the same manner as any of the automatic actuation signals. ① ②

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~~ selector switch and the interconnecting wiring to the actuation logic cabinet. ②

2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

② INSERT 1

one of three sets of manual initiation switches in the control room. Either of the two Phase A and Containment Ventilation Isolation switches (HS-30-63A and HS-30-63B) or, both Phase B and Containment Ventilation Isolation switches (HS-30-64A and HS-30-64B), or both Phase B Containment Isolation switches (HS-30-68A and HS-30-68B), will actuate both trains of CVI.

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~~ ventilation isolation portion of ~~these Functions are~~ the SI Function is different and less restrictive than those for the~~ir Phase A isolation and~~ SI role~~s~~. If one or more of the SI ~~or Phase A isolation~~ Functions becomes inoperable in such a manner that only the Containment ~~Purge~~ Ventilation Isolation Function is affected, the Conditions applicable to the~~ir~~ SI ~~and Phase A isolation~~ Functions need not be entered. The less restrictive Actions specified for inoperability of the Containment ~~Purge~~ Ventilation Isolation Functions specify sufficient compensatory measures for this case. ②

3. <u>Containment Radiation</u>

The LCO specifies ~~four~~ one required channel~~s~~ of radiation monitors to ② ensure that the radiation monitoring instrumentation necessary to initiate Containment ~~Purge~~ Ventilation Isolation remains OPERABLE. ②

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY ~~may~~ also requires correct valve lineup~~s,~~ and 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. ②

4. ~~<u>Containment Isolation - Phase A</u>~~ Safety Injection (SI) ④

Refer to LCO 3.3.2, Function ~~3.a~~1., for all initiating Functions and requirements.

APPLICABILITY

The Manual Initiation, Automatic Actuation Logic and Actuation Relays, ~~Containment Isolation - Phase A~~ Safety Injection, 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~~ 100 hours)~~]~~ within containment. Under these conditions, the potential exists for an accident that could release significant fission product radioactivity into containment. Therefore, the containment ~~purge and exhaust~~ Ventilation isolation instrumentation must be OPERABLE in these MODES. ④ ③ ①

INSERT 2 ④

② INSERT 2

Since the movement of recently irradiated fuel assemblies in containment can only occur in MODE 6 or with the unit defueled, only one Containment Purge Air Radiation Monitor is required to be OPERABLE during the movement of recently irradiated fuel assemblies in containment.

BASES

APPLICABILITY (continued)

While in MODES 5 and 6 without fuel handling in progress, the containment ~~purge and exhaust~~ ventilation 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. ①

The Applicability for the containment ~~purge and exhaust~~ ventilation isolation on the ESFAS ~~Containment Isolation-Phase A~~ 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~~ Safety Injection Function Applicability. ① ④ ④

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. ②

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 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.~~ ④

BASES

ACTIONS (continued)

~~B~~A.1 ④

Condition ~~B~~ A applies to all Containment ~~Purge and Exhaust~~ Ventilation Isolation Functions and addresses the train orientation of the Solid State Protection System (SSPS) and the 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~~. ④ ① ④

If a train is inoperable~~,~~ or 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. ④

A Note is added stating that Condition ~~B~~ A is only applicable in MODE 1, 2, 3, or 4. ④

~~C~~B.1 and ~~C~~B.2 ④

Condition ~~C~~ B applies to all Containment ~~Purge and Exhaust~~ Ventilation Isolation Functions and addresses the train orientation of the SSPS and the master and slave relays for these Functions. It also addresses the failure of ~~multiple~~ the single required radiation monitoring channel~~s, 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~~ or the required radiation monitoring channel is 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~~ ventilation isolation valves in their closed position is met or the applicable Conditions of LCO 3.9.4, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately. ④ ① ④ ①

A Note states that Condition ~~C~~ B is applicable during movement of ~~[~~recently~~]~~ irradiated fuel assemblies within containment. ④ ③

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~~ Ventilation Isolation Functions. ①

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 months 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.~~

~~OR~~ ⑤

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~

~~OR~~

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

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

④

~~SR 3.3.6.3~~

~~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.~~

~~OR~~

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

④

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

~~[~~ SR 3.3.6.~~4~~2 ③ ④

SR 3.3.6.~~4~~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 92 days on a STAGGERED TEST BASIS. The Surveillance interval is justified in Reference 2.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

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~~3 ④

SR 3.3.6.~~5~~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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑥
~~--]~~

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the EFAS Instrumentation. ~~]~~ ③

SR 3.3.6.~~6~~4 ④

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. ~~[The Frequency of 92 days is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 3).~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑥
~~--]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

This test verifies the capability of the instrumentation to provide the containment ~~purge and exhaust~~ ventilation system isolation. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ①

SR 3.3.6.~~7~~5 ④

SR 3.3.6.~~7~~5 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. ~~[The Frequency of 92 days is acceptable based on instrument reliability and industry operating experience.~~

~~OR~~ ⑤

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

SR 3.3.6.~~8~~6 ④

SR 3.3.6.~~8~~6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions. 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 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. ②

~~[The Frequency of 18 months is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~ ⑤

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑥
~~---]~~

SR 3.3.6.~~9~~ 7 ④

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑤

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑥

INSERT 3 ②

REFERENCES

1. 10 CFR 100.11.
2. ~~WCAP-15376, Rev. 0, October 2000.~~ UFSAR Table 7.3.1-4 ②
3. ~~NUREG-1366, [date].~~ WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995 ②

②
INSERT 3

SR 3.3.6.8

This SR ensures the individual channel 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 Updated Final Safety Analysis Report, Table 7.3.1-4 (Ref. 2). 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 to the point at which the equipment in both trains reaches the required functional state (e.g., valves in full open or closed position).

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 signal processing and actuation logic response times with actual response time tests on the remainder of the channel.

WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," (Ref. 3) 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 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.

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

SR 3.3.6.8 is modified by a Note stating that radiation detectors are excluded from response time testing.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.6 BASES, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS B 3.3.6B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Containment Purge and Exhaust Isolation Instrumentation" to " Containment Ventilation Isolation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have a Containment Purge and Exhaust Isolation Instrumentation.

2. 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.

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

4. Changes are made to be consistent with changes made to the Specification.

5. ISTS SR 3.3.6.1, SR 3.3.6.4, SR 3.3.6.5, SR 3.3.6.6, SR 3.3.6.7, SR 3.3.6.8 and SR 3.3.6.9 (ITS SR 3.3.6.1, SR 3.3.6.2, SR 3.3.6.3, SR 3.3.6.4, SR 3.3.6.5, SR 3.3.6.6, and SR 3.3.6.7, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 7

ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

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

3/4.3.3 MONITORING INSTRUMENTATION

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION A02

~~RADIATION MONITORING~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

CREVS actuation A02

LCO 3.3.7

3.3.3.1 The ~~radiation monitoring~~ instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

Applicability

APPLICABILITY: As shown in Table 3.3-6.

Add proposed ACTIONS Note A03

ACTION:

M01

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

CREVS actuation instrumentation A02

ACTION A, ACTION B, ACTION C, ACTION D, ACTION E

b. With one or more ~~radiation monitoring~~ channels inoperable, take the ACTION shown in Table 3.3-6.

M02

c. ~~The provisions of Specification 3.0.3 are not applicable.~~

SURVEILLANCE REQUIREMENTS

CREVS actuation A02

SR Table Note

4.3.3.1 Each ~~radiation monitoring~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-3.

CHANNEL OPERATIONAL TEST (COT) M03

Table 3.3.7-1

TABLE 3.3-6
CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION ~~RADIATION MONITORING~~ INSTRUMENTATION

A02

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION	LA01
1. AREA MONITOR						
a. Fuel Storage Pool Area	1	*	≤ 151 mR/hr	10^{-1} - 10^{4} mR/hr	26	See ITS 3.3.8
2. PROCESS MONITORS						
a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤ 8.5x 10^{-3} µCi/cc	10 - 10^{7} cpm	28	See ITS 3.3.6
b. Containment						See ITS 3.4.15
i. Deleted						
ii. Particulate Activity						
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27	
Function 3 c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	~~10 - 10^{7} cpm~~	29	LA01

Add proposed Table 3.3.7-1 Function 1 M04

Add proposed Table 3.3.7-1 Function 2 M05

Add proposed Table 3.3.7-1 Function 4 M06

* With fuel in the storage pool or building See ITS 3.3.8

Footnote (b) ** Equivalent to 1.0 x 10^{-5} µCi/cc.

A01

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (MODE 6) and 3.3.2.1 (MODES 1, 2, 3, and 4).

See ITS 3.3.6

ACTION 29 - a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION A

ACTION C

Add proposed ACTIONS D and E

M07

b. With two channels inoperable, ~~within 1 hour~~ initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Immediately

L01

ACTION B

Or

Immediately

L01

place both trains in the recirculation mode of operation ~~within one hour~~.

ACTION C

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION D

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, ~~suspend core alterations~~ and suspend movement of irradiated fuel assemblies.

L02

ACTION E

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

Add proposed Required Actions for Table 3.3.7-1 Function 1

M04

ITS

A01

ITS 3.3.7

Table 3.3.7-1

TABLE 4.3-3

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION — A02

~~RADIATION MONITORING~~ INSTRUMENTATION SURVEILLANCE REQUIREMENTS

COT — M03

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~	MODES FOR WHICH SURVEILLANCE REQUIRED
1. AREA MONITOR				
a. Fuel Storage Pool Area	S	R	Q	*
2. PROCESS MONITORS				
a. Containment Purge Air Exhaust	S	R	Q	1, 2, 3, 4 & 6
b. Containment				
i. Deleted				
ii. Particulate Activity				
RCS Leakage Detection	S	R	Q	1, 2, 3, & 4
c. Control Room Isolation	~~S~~ SR 3.3.7.1	~~R~~ SR 3.3.7.7	~~Q~~ SR 3.3.7.2	ALL MODES

See ITS 3.3.8 (1.a)

See ITS 3.3.6 (2.a)

See ITS 3.4.15 (2.b)

Function 3 (2.c)

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.6 for Table 3.3.7-1 Function 1 at a Frequency of ~~18 months~~ — M04

*With fuel in the storage pool or building. — See ITS 3.3.8

Add proposed SR 3.3.7.3 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ — M05

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.4 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ — M05

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.5 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days~~ — M05

INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION A02

~~RADIATION MONITORING~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

CREVS actuation A02

LCO 3.3.7 3.3.3.1 The ~~radiation monitoring~~ instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

Applicability APPLICABILITY: As shown in Table 3.3-6.

Add proposed ACTIONS Note A03

ACTION:

M01

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

CREVS actuation instrumentation A02

ACTION A, ACTION B, ACTION C, ACTION D, ACTION E

b. With one or more ~~radiation monitoring~~ channels inoperable, take the ACTION shown in Table 3.3-6.

M02

c. ~~The provisions of Specification 3.0.3 are not applicable.~~

SURVEILLANCE REQUIREMENTS

CREVS actuation A02

SR Table Note 4.3.3.1 Each ~~radiation monitoring~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-3.

CHANNEL OPERATIONAL TEST (COT) M03

ITS

A01

ITS 3.3.7

Table 3.3.7-1

TABLE 3.3-6

~~RADIATION MONITORING~~ INSTRUMENTATION

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION

A02

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION	
					LA01		
	1. AREA MONITOR						
	a. Fuel Storage Pool Area	1	*	≤151 mR/hr	10^{-1} - 10^{4} mR/hr	26	See ITS 3.3.8
	2. PROCESS MONITORS						
	a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤8.5 x 10^{-3} µCi/cc	10 - 10^{7} cpm	28	See ITS 3.3.6
	b. Containment						
	i. Deleted						
	ii. Particulate Activity						See ITS 3.4.15
	RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27	
Function 3	c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	~~10 - 10^{7} cpm~~	29	LA01

Add proposed Table 3.3.7-1 Function 1 — M04

Add proposed Table 3.3.7-1 Function 2 — M05

Add proposed Table 3.3.7-1 Function 4 — M06

* With fuel in the storage pool or building — See ITS 3.3.8

Footnote (b) ** Equivalent to 1.0 x 10^{-5} µCi/cc.

A01

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

See ITS 3.3.8

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (MODE 6) and 3.3.2 (MODES 1, 2, 3, and 4).

See ITS 3.3.6

ACTION 29 -

a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION A

ACTION C

Add proposed ACTIONS D and E — M07

b. With two channels inoperable, ~~within 1 hour~~ initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Immediately — L01

ACTION B

Or

place both trains in the recirculation mode of operation ~~within one hour~~.

Immediately — L01

ACTION C

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION D

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, ~~suspend core alterations~~ and suspend movement of irradiated fuel assemblies.

L02

ACTION E

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

Add proposed Required Actions for Table 3.3.7-1 Function 1 — M04

ITS

A01

ITS 3.3.7

Table 3.3.7-1

TABLE 4.3-3

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION — A02

~~RADIATION MONITORING~~ INSTRUMENTATION SURVEILLANCE REQUIREMENTS

COT — M03

	INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~ COT	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
	1. AREA MONITOR					See ITS 3.3.8
	a. Fuel Storage Pool Area	S	R	Q	*	
	2. PROCESS MONITORS					
	a. Containment Purge Air Exhaust	S	R	Q	1, 2, 3, 4 & 6	See ITS 3.3.6
	b. Containment					See ITS 3.4.15
	i. Deleted					
	ii. Particulate Activity					
	RCS Leakage Detection	S	R	Q	1, 2, 3 & 4	
Function 3	c. Control Room Isolation	~~S~~ SR 3.3.7.1	~~R~~ SR 3.3.7.7	~~Q~~ SR 3.3.7.2	ALL MODES	

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.6 for Table 3.3.7-1 Function 1 at a Frequency of ~~18 months~~ — M04

Add proposed SR 3.3.7.3 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ — M05

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.4 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days on a STAGGERED TEST BASIS~~ — M05

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* With fuel in the storage pool or building. — See ITS 3.3.8

In accordance with the Surveillance Frequency Control Program — LA02

Add proposed SR 3.3.7.5 for Table 3.3.7-1 Function 2 at a Frequency of ~~92 days~~ — M05

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.3.1 requires, in part, the radiation monitoring instrumentation channels shown in Table 3.3-6 to be OPERABLE. CTS 3.3.3.1 ACTIONS a and b provide the Required Actions and associated Completion Time for when the radiation monitoring instrumentation is inoperable. CTS 4.3.3.1 requires, in part, that each radiation monitoring instrumentation channel be demonstrated OPERABLE. CTS Table 3.3-6 lists the instruments required to be OPERABLE, the Applicable MODES, and the appropriate ACTIONS to take for the Radiation Monitoring Instrumentation. ITS LCO 3.3.7 requires, in part, that the Control Room Emergency Ventilation System (CREVS) actuation instrumentation for each Function in Table 3.3.7-1 to be OPERABLE. ITS 3.3.7 ACTIONS A, B, C, D, and E provide the Required Actions and associated Completion Time for when the CREVS actuation instrumentation is inoperable. ITS SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.3, SR 3.3.7.4, SR 3.3.7.5, SR 3.3.7.6, and SR 3.3.7.7 provide the testing requirements for each CREVS actuation instrument in Table 3.3.7-1. This changes the CTS by having a separate Specification for the CREVS actuation instrumentation, in lieu of including them in the Radiation Monitoring Instrumentation Specification.

This change is acceptable because the technical requirements for the radiation monitoring instrumentation are maintained with the change in format. The CREVS Actuation Instrumentation continues to require the OPERABILITY of the radiation monitoring instrumentation. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 The ACTIONS for CTS 3.3.3.1 do not contain a specific Note that allows separate Condition entry for each instrument. ITS 3.3.7 ACTIONS contains a Note which states that separate Condition entry is allowed for each Function. This changes the CTS by specifically allowing separate Condition entry for each specified Function.

This change is acceptable because it clearly states the current requirement. The CTS considers each radiation monitoring instrument Function to be separate and independent. This change is designated as administrative because it does not result in a technical change to the CTS.

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.1 ACTION a requires that when a radiation monitor channel alarm/trip setpoint exceeds the value shown in Table 3.3-6, to adjust the setpoint within 4 hours or declare the channel inoperable. ITS 3.3.7 does not contain an ACTION for adjusting a setpoint that exceeds the required valued. Instead, ITS 3.3.7 ACTION A requires that when one required radiation monitoring channel is inoperable (i.e., setpoint not within tolerance) to enter the applicable Required Actions immediately. This changes the CTS by not allowing adjustment of the setpoint in 4 hours before declaring the channel inoperable.

The purpose of CTS 3.3.3.1 ACTION a is to allow adjustment of the radiation monitor setpoint to within limits before declaring the channel inoperable. Although ITS does not include this allowance, restoration such that the LCO is met, is always an option. This change is acceptable because the channel requirements in ITS 3.3.7 will ensure that the required radiation monitoring channel is OPERABLE. The proposed ITS ACTION for when one channel is inoperable will ensure that the Required Actions and Completion Times used establish remedial measures that when taken minimize risk associated with continued operation. This change is designated as more restrictive because more stringent Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M02 CTS 3.3.3.1 ACTION c states that the provisions of Specification 3.0.3 are not applicable for the radiation monitoring instrumentation in CTS Table 3.3-6. ITS 3.3.7 does not contain this exception. This changes the CTS by not allowing an exception to CTS Specification 3.0.3.

CTS 3.0.3 requires the unit to be shut down when the requirements of the LCO and the associated ACTIONS are not satisfied. This change is acceptable because ITS 3.3.7 does not provide an exception to LCO 3.0.3 for the radiation monitoring instrumentation used for control room isolation. Eliminating the CTS 3.0.3 exemption ensures that the operators are provided guidance regarding actions to take in the event the required radiation monitoring instrumentation is inoperable and the associated ACTIONS are not satisfied within the required time periods. This change is designated as more restrictive because an explicit exception provided in the CTS is eliminated.

M03 CTS 4.3.3.1 requires, in part, that the radiation monitoring instrumentation on Table 4.3-3 be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST. CTS Table 4.3-3 Instrument 2.c (Process Monitors – Control Room Isolation) requires a CHANNEL FUNCTIONAL TEST. ITS Table 3.3.7-1 Function 3 (Control Room Radiation – Control Room Air Intakes) requires the performance of ITS SR 3.3.7.2. ITS SR 3.3.7.2 requires the performance of a CHANNEL OPERATIONAL TEST (COT). This changes the CTS by requiring a COT instead of a CHANNEL FUNCTIONAL TEST.

This change is acceptable because the COT continues to perform tests similar to the current CHANNEL FUNCTIONAL TEST. The CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS, a CHANNEL

FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The COT provides similar tests with the addition that the COT includes adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires additional acceptance criteria that is not currently required in the CTS.

M04 CTS Table 3.3-6 and CTS Table 4.3-3 do not contain requirements for a manual initiation of the CREVS actuation instrumentation. ITS Table 3.3.7-1 Function 1 contains the applicable MODES, Required Channels, and Surveillance Requirements for the manual initiation of CREVS. ITS 3.3.7 ACTIONS provide the compensatory actions to take when ITS Table 3.3.7-1 Function 1 is not satisfied. Additionally, ITS SR 3.3.7.6 has been added to provide the testing requirements for manual initiation of the CREVS. This changes the CTS by adding requirements for the manual initiation function of the CREVS.

This change is acceptable because the manual initiation Function is necessary to ensure that the operator has manual initiation capability for CREVS at any time from the control room. Initiation of CREVS can be accomplished by manual initiation of Safety Injection. The safety injection function refers the operator to LCO 3.3.2 for all of the Safety Injection initiation functions and requirements. This change is designated as more restrictive because additional functions are required in the ITS than were in the CTS.

M05 CTS Table 3.3-6 Instrument 2.c does not contain a requirement for the Automatic Actuation Logic and Actuation Relays associated with the Control Room Isolation. CTS Table 4.3-3 Instrument 2.c does not provide Surveillance Requirements for Actuation Logic testing and Master and Slave relay testing of the Automatic Actuation Logic and Actuation Relays associated with the Control Room Isolation. ITS Table 3.3.7-1 Function 2 provides the requirements for the 2 trains of Automatic Actuation Logic and Actuation Relays in MODES 1, 2, 3, 4, 5, 6 and during movement of irradiated fuel assemblies. If one train of the Automatic Actuation Logic and Actuation Relays Function is inoperable, ACTION A specifies that one train of CREVS be placed in the recirculation mode in 7 days. If two trains of the Automatic Actuation Logic and Actuation Relays Function are inoperable, ACTION B specifies that one train of CREVS be placed in the recirculation mode immediately and the applicable Conditions are Required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation be entered immediately. Otherwise, both trains of CREVS are required to be placed in the recirculation mode immediately. If the Required

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

Actions and Completion Times of Condition A or B are not met in MODES 1, 2, 3, or 4, ACTION C specifies that the unit be placed in MODE 3 in 6 hours and MODE 5 in 36 hours. If the Required Actions and Completion Times of Condition A or B are not met during the movement of irradiated fuel assemblies, ACTION D specifies to immediately suspend the movement of fuel assemblies. If the Required Actions and Completion Times of Condition A or B are not met in MODES 5 or 6, ACTION E specifies to immediately initiate action to restore one CREVS train to OPERABLE status. Additionally, ITS Table 3.3.7-1 requires the following Surveillance Requirements for the Automatic Actuation Logic and Actuation Relays: an ACTUATION LOGIC TEST (SR 3.3.7.3) every 92 days on a STAGGERED TEST BASIS; a MASTER RELAY TEST (SR 3.3.7.4) every 92 days on a STAGGERED TEST BASIS; and a SLAVE RELAY TEST (SR 3.3.7.5) every 92 days. This changes the CTS by adding requirements for the CREVS Automatic Actuation Logic and Actuation Relays Function.

The Automatic Actuation Logic and Actuation Relays are required to support the OPERABILITY of the CREVS actuation instrumentation. Requiring two trains of Automatic Actuation Logic and Actuation Relays will ensure CREVS will actuate to terminate the supply of unfiltered outside air to the control room, initiate filtration, and pressurize the control room in the event of a design basis accident concurrent with a single failure. The specified Actions will ensure that the CREVS actuation instrumentation Function is accomplished or the unit is placed in a condition where the LCO requirements are not applicable. The addition of the proposed Surveillance Requirements will verify the OPERABILITY of the Automatic Actuation Logic and Actuation Relays. This change is designated as more restrictive because additional functions are required in the ITS than were in the CTS.

M06 CTS 3.3.3.1 states, "The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be OPERABLE." Table 3.3-6 lists the radiation monitors required for the Control Room Isolation. ITS LCO 3.3.7 states, "The Control Room Emergency Ventilation System (CREVS) actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE." ITS Table 3.3.7-1 lists all required CREVS instrument functions which includes the Safety Injection signal. The ITS Table 3.3.7-1 specification of the Safety Injection signal includes a reference to the requirements for the Safety Injection signal being specified in ITS 3.3.2, Engineered Safety Feature Actuation (EFAS) instrumentation. This changes the CTS by specifying an additional instrumentation actuation function for the CREVS.

ITS 3.3.7 is a system related instrumentation specification that includes all the required instrumentation for the CREVS. The Safety Injection signal, although specified in ITS 3.3.2, EFAS instrumentation, provides an actuation of CREVS that is credited in the LOCA safety analysis. The proposed change provides a more complete listing of the required CREVS actuations in a single specification. If the Safety Injection Function is inoperable, such that only the CREVS function is affected, the less restrictive Actions of ITS 3.3.7 would be applicable. The other credited CREVS actuation instrumentation provides a complete list of required CREVS instrumentation with a common set of Actions to assure the plant is placed in a safe condition when the required instrumentation is inoperable. Thus, the proposed change ensures the control room doses after a design basis event are maintained within the required limits. This change is designated as more restrictive because additional functions are required in the ITS than were in the CTS.

M07 CTS Table 3.3-6 ACTION 29a requires when one channel of the control room isolation instrumentation is inoperable and a CREVS train is not placed in the recirculation mode of operation within 7 days, to be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours in all MODES and during movement of irradiated fuel assemblies. ITS ACTION D requires when one channel of the control room isolation is inoperable (during movement of irradiated fuel assemblies) and a CREVS train is not placed in the recirculation mode of operation within 7 days, to immediately suspend movement of irradiated fuel assemblies. ITS ACTION E requires that when one channel of the control room isolation is inoperable and a CREVS train is not placed in the recirculation mode of operation within 7 days (in MODE 5 or 6) to initiate action to immediately restore one CREVS train to OPERABLE status. This changes the CTS by adding Required Actions if one channel of control room isolation is inoperable and a CREVS train is not placed in the recirculation mode of operation within 7 days when in MODE 5 or 6 and during movement of irradiated fuel assemblies.

The purpose of CTS Table 3.3-6 ACTION 29a is to provide the compensatory actions to take when one or more instrumentation channels of CREVS are inoperable. ITS 3.3.7 ACTIONS D and E provide new compensatory actions to take during the movement of irradiated fuel assemblies and in MODE 5 or 6. This change is acceptable because these compensatory actions are commensurate with the Applicable MODES of operation or other specified conditions. During the movement of irradiated fuel assemblies, suspending the movement of irradiated fuel assemblies alone will reduce the risk of an accident that would require CREVS actuation. Furthermore, because the requirements for MODES 5 and 6 are to ensure adequate isolation capabilities in the event of a fuel handling accident, ITS 3.3.7 ACTION E, to initiate action to restore one CREVS train to OPERABLE status, is the correct action to take. This change is considered more restrictive because additional Required Actions are being applied in ITS that were not applied in CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6 for Radiation Monitoring Instrumentation has five columns stating various requirements for the radiation monitoring instruments. These columns are labeled "MINIMUM CHANNELS OPERABLE," "APPLICABLE MODES," "ALARM/TRIP SETPOINT," "MEASUREMENT

RANGE," AND "ACTION." ITS Table 3.3.7-1 does not contain the column titled "MEASUREMENT RANGE." This changes the CTS by moving this information to the Bases.

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

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS Table 4.3-3 Instrument 2.c requires a CHANNEL CHECK every shift (12 hours), a CHANNEL FUNCTIONAL TEST every quarter (92 days), and a CHANNEL CALIBRATION every refueling cycle (18 months). ITS SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.3, SR 3.3.7.6, and SR 3.3.7.7 require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for this SR and associated Bases to the Surveillance Frequency Control Program. (See DOC M03 for discussion on changing the CHANNEL FUNCTIONAL TEST to a COT. See DOC M05 for the addition of ITS SR 3.3.7.3, SR 3.3.7.4, and SR 3.3.7.5. See DOC M04 for the addition of ITS SR 3.3.7.6.)

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-6 ACTION 29b requires that when two channels of the Control Room Isolation instrumentation are inoperable, to initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation within one hour or to place both trains in the recirculation mode of operation within one hour. ITS 3.3.7 ACTION B requires the same actions, but specifies the Completion Time as "Immediately." This changes the CTS by allowing additional time to complete ITS 3.3.7 ACTION B.

The purpose of CTS Table 3.3-6 ACTION 29b is to ensure that the CREVS will be able to perform its required safety function. This change is acceptable because the Required Actions have not changed, just the Completion Time. When the Completion Time of "Immediately" is used in the ITS, it requires that the Required Action should be pursued without delay and in a controlled manner. Depending on plant conditions, the Required Action could be completed within one hour or may take longer than one hour. The ITS 3.3.7 ACTION B Completion Time is acceptable because it will be completed without delay. This change is designated as less restrictive because less stringent Required Actions are being applied in ITS than were applied in CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-6 ACTION 29b provides compensatory actions to take when the completion time of the specified actions cannot be met during the movement of irradiated fuel assemblies. One of the compensatory actions is to suspend core alterations. ITS 3.3.7 ACTION D does not require suspension of core alterations, but instead only requires the suspension of the movement of irradiated fuel assemblies. This changes the CTS by deleting the requirement to suspend core alterations.

The purpose of CTS Table 3.3-6 ACTION 29 is to reduce the risk of an accident that would require the CREVS to operate. CORE ALTERATIONS is defined in CTS 1.1, in part, as "the movement of any fuel, sources, reactivity control components, or other components affecting reactivity within the reactor vessel with the vessel head removed and fuel in the vessel." The accidents postulated to happen during core alterations, are fuel handling accidents, inadvertent criticality (due to control rod removal error or continuous control rod withdrawal error during refueling or boron dilution), and the inadvertent loading of, and subsequent operation with, a fuel assembly in an improper location. This change is acceptable because the only accident that can occur during CORE ALTERATIONS that results in a significant radioactive release is the fuel handling accident. ITS 3.3.7 Required Action D.1 requires the immediate suspension of movement of irradiated fuel assemblies, thereby reducing the risk of an accident that would require the actuation of CREVS. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

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

3.3 INSTRUMENTATION

3.3.7~~A~~ Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~VS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.1 LCO 3.3.7 The CRE~~F~~VS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE. ①

3.3.3.1 Applicability APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

DOC A03
---NOTE---
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Table 3.3-6 ACTION 29a	A. One or more Functions with one channel or train inoperable.	A.1 ~~--------------NOTE--------------~~ ~~[Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.]~~ ~~-------------------------------------~~ Place one CRE~~F~~VS train in ~~emergency [radiation protection]~~ recirculation mode.	7 days	② ① ③ ②
Table 3.3-6 ACTION 29b	B. One or more Functions with two channels or two trains inoperable.	~~--------------------NOTE--------------------~~ ~~[Place in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.]~~ ~~---~~ B.1.1 Place one CRE~~F~~VS train in ~~emergency [radiation protection]~~ recirculation mode. AND	Immediately	② ① ③ ②

CTS

CRE~~F~~VS Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.7A

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Table 3.3-6 ACTION 29.b		B.1.2 Enter applicable Conditions and Required Actions for one CRE~~F~~VS train made inoperable by inoperable CRE~~F~~VS actuation instrumentation. OR B.2 Place both trains in ~~emergency [radiation protection]~~ recirculation mode.	Immediately Immediately	① ① ③ ②
Table 3.3-6 ACTIONS 29a and 29b	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 M07, Table 3.3-6 ACTION 29b	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	② ②
DOC M07, Table 3.3-6 ACTION 29b	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 CRE~~F~~VS train to OPERABLE status.	Immediately ~~]~~	② ①

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~
V
3.3.7~~A~~ ①

SURVEILLANCE REQUIREMENTS

V

---NOTE---

4.3.3.1 Refer to Table 3.3.7-1 to determine which SRs apply for each CRE~~F~~S Actuation Function. ①

	SURVEILLANCE	FREQUENCY	
Table 4.3-3 Instrument 2.c	SR 3.3.7.1 Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	④ ④
Table 4.3-3 Instrument 2.c	SR 3.3.7.2 Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	④ ④
	~~SR 3.3.7.3 Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	④

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
	~~SR 3.3.7.4 Perform MASTER RELAY TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	⑤
	~~-------------------------------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.~~ ~~--~~		⑥
DOC M05	SR 3.3.7.~~5~~ 3 -----------------------------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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program~~]~~	⑤ ④ ④

CTS

CRE~~F~~S V Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.7~~A~~ 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.~~ ~~-----~~		⑥
DOC M05	SR 3.3.7.~~6~~ 4 -----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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
DOC M05	SR 3.3.7.~~7~~ 5 Perform SLAVE RELAY TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
V
3.3.7A

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M04	SR 3.3.7.~~8~~ 6	------------------------------NOTE----------------------------- Verification of setpoint is not required. -- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
Table 4.3-3 Instrument 2.c	SR 3.3.7.~~9~~ 7	Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~
V

3.3.7~~A~~ ①

Table 3.3.7-1 (page 1 of 1)
V
CRE~~F~~S Actuation Instrumentation ①

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
DOC M04	1. Manual Initiation	1, 2, 3, 4, ~~[~~5, 6~~]~~, (a)	2 trains	SR 3.3.7.~~8~~ 6	NA	② ⑤
DOC M05	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~~ 3 SR 3.3.7.~~6~~ 4 SR 3.3.7.~~7~~ 5	NA	② ⑤
Table 4.3-3 Instrument 2.c	3. Control Room Radiation					③
	a. ~~Control Room Atmosphere~~	~~1, 2, 3, 4 [5, 6], (a)~~	~~[2]~~	~~SR 3.3.7.1~~ ~~SR 3.3.7.2~~ ~~SR 3.3.7.9~~	~~≤ [2] mR/hr~~	⑤
	~~b.~~ Control Room Air Intakes	1, 2, 3, 4, ~~[~~5, 6~~]~~, (a)	~~[~~2~~]~~	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.~~9~~ 7	400 cpm (b) ≤ ~~[2] mR/hr~~	⑤ ② ③ ⑤
DOC M06	4. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.				

Table 4.3-3 Instrument 2.c — (a) During movement of ~~[recently]~~ irradiated fuel assemblies. ②

Table 3.3-6 Footnote ** — (b) Equivalent to 1.0×10^{-5} µCi/cc. ③

3.3 INSTRUMENTATION

3.3.7~~A~~ Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~VS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.1 LCO 3.3.7 The CRE~~F~~VS actuation instrumentation for each Function in Table 3.3.7-1 shall be OPERABLE. ①

3.3.3.1 Applicability APPLICABILITY: According to Table 3.3.7-1.

ACTIONS

DOC A03
---NOTE---
Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Table 3.3-6 ACTION 29a	A. One or more Functions with one channel or train inoperable.	A.1 ~~--------------NOTE--------------~~ ~~[Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.]~~ ~~--~~		②
		Place one CRE~~F~~VS train in ~~emergency [radiation protection]~~ recirculation mode.	7 days	① ③ ②
Table 3.3-6 ACTION 29b	B. One or more Functions with two channels or two trains inoperable.	~~--------------------NOTE--------------------~~ ~~[Place in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.]~~ ~~--~~		②
		B.1.1 Place one CRE~~F~~VS train in ~~emergency [radiation protection]~~ recirculation mode. AND	Immediately	① ③ ②

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
V
3.3.7A

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Table 3.3-6 ACTION 29.b		B.1.2 Enter applicable Conditions and Required Actions for one CRE~~F~~S train made inoperable by inoperable CRE~~F~~S actuation instrumentation. V V OR B.2 Place both trains in ~~emergency [radiation protection]~~ recirculation mode.	Immediately Immediately	① ① ③ ②
Table 3.3-6 ACTIONS 29a and 29b	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 M07, Table 3.3-6 ACTION 29b	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	② ②
DOC M07, Table 3.3-6 ACTION 29b	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 CRE~~F~~S train to OPERABLE status. V	Immediately]	② ①

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ V ①
3.3.7A

SURVEILLANCE REQUIREMENTS

V

--NOTE--

4.3.3.1 Refer to Table 3.3.7-1 to determine which SRs apply for each CRE~~F~~S Actuation Function. ①

	SURVEILLANCE		FREQUENCY	
Table 4.3-3 Instrument 2.c	SR 3.3.7.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	④ ④
Table 4.3-3 Instrument 2.c	SR 3.3.7.2	Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	④ ④
	~~SR 3.3.7.3~~	~~Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~	④

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
V
3.3.7A

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.3.7.4 Perform MASTER RELAY TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ ⑤
~~-----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.~~ ~~-----~~ ⑥	
DOC M05 SR 3.3.7.~~5~~ 3 ⑤ -----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~~ ~~OR~~ ④ In accordance with the Surveillance Frequency Control Program ~~]~~ ④

CTS

CRE~~F~~VS Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.7~~A~~ 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.~~ ~~--~~			⑥
DOC M05	SR 3.3.7.~~6~~ 4	------------------------------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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
DOC M05	SR 3.3.7.~~7~~ 5	Perform SLAVE RELAY TEST.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
V
3.3.7A

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
DOC M04	SR 3.3.7.~~8~~ 6	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④
Table 4.3-3 Instrument 2.c	SR 3.3.7.~~9~~ 7	Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ④ ④

CTS

CRE~~F~~VS Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.7~~A~~

Table 3.3.7-1 (page 1 of 1) ①
CRE~~F~~VS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
DOC M04	1. Manual Initiation	1, 2, 3, 4, ~~[~~5, 6~~]~~, (a)	2 trains	SR 3.3.7.~~8~~6	NA	② ⑤
DOC M05	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~~3 SR 3.3.7.~~6~~4 SR 3.3.7.~~7~~5	NA	② ⑤
Table 4.3-3 Instrument 2.c	3. Control Room Radiation					③
	a. ~~Control Room Atmosphere~~	~~1, 2, 3, 4 [5, 6], (a)~~	~~[2]~~	~~SR 3.3.7.1~~ ~~SR 3.3.7.2~~ ~~SR 3.3.7.9~~	~~≤ [2] mR/hr~~	⑤
	~~b.~~ Control Room Air Intakes	1, 2, 3, 4, ~~[~~5, 6~~]~~, (a)	~~[~~2~~]~~	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.~~9~~7	≤ ~~[2] mR/hr~~ 400 cpm [(b)]	⑤ ② ③ ⑤
DOC M06	4. Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.				

Table 4.3-3 Instrument 2.c — (a) During movement of ~~[recently]~~ irradiated fuel assemblies. ②

Table 3.3-6 Footnote ** — (b) Equivalent to 1.0 x 10^{-5} μCi/cc. ③

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS 3.3.7B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Control Room Emergency Filtration System (CREFS) Actuation Instrumentation" to " Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have a CREFS.

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

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.

4. ISTS SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.5, SR 3.3.7.6, SR 3.3.7.7, SR 3.3.7.8, and SR 3.3.7.9 (ITS SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.3, SR 3.3.7.4, SR 3.3.7.5, SR 3.3.7.6, and SR 3.3.7.7) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

5. The ACTUATION LOGIC TEST and MASTER RELAY TEST for SQN are processed through the Solid State Protection System. Since ISTS SR 3.3.7.5 and ISTS SR 3.3.7.6 are the appropriate Surveillance for the ACTUATION LOGIC TEST and MASTER RELAY TEST when they are processed through the Solid State Protection System, ISTS SR 3.3.7.3 and SR 3.3.7.4 have been deleted and the subsequent Surveillance Requirements have been renumbered.

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

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

B 3.3 INSTRUMENTATION

B 3.3.7~~A~~ Control Room Emergency ~~Filtration~~Ventilation System (CRE~~F~~VS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The CRE~~F~~VS provides an enclosed control room environment from which ①
the unit can be operated following an uncontrolled release of radioactivity.
During normal operation, the ~~Auxiliary~~Control Building Ventilation System ②
provides control room ventilation. Upon receipt of an actuation signal, the
CRE~~F~~VS initiates filtered ventilation and pressurization of the control room. ①
This system is described in the Bases for LCO 3.7.10, "Control Room
Emergency ~~Filtration~~Ventilation System (CREVS)." ③

The actuation instrumentation consists of redundant radiation monitors in
the air intake~~s and control room area~~. A high radiation signal from any ~~of~~ ②
~~these~~ detector~~s~~ will initiate ~~both~~its associated train~~s~~ of the CRE~~F~~VS. The control room
operator can also initiate CRE~~F~~VS trains by manual switches in the control ①
room. The CRE~~F~~VS 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."

APPLICABLE SAFETY ANALYSES

The control room must be kept habitable for the operators stationed there during accident recovery and post accident operations.

The CRE~~F~~VS acts to terminate the supply of unfiltered outside air to the ①
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.

In MODES 1, 2, 3, and 4, the radiation monitor actuation of the CRE~~F~~VS is ①
a backup for the SI signal actuation. This ensures initiation of the CRE~~F~~VS
during a loss of coolant accident or ~~steam generator tube rupture~~main steam line break. ①

The radiation monitor actuation of the CRE~~F~~VS in MODES 5 and 6, and ①
during movement of ~~[recently]~~ irradiated fuel assemblies are the primary ④
means to ensure control room habitability in the event of a fuel handling ②
~~or waste gas decay tank rupture~~ accident.

The CRE~~F~~VS actuation instrumentation satisfies Criterion 3 of ①
10 CFR 50.36(c)(2)(ii).

BASES

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CRE~~F~~VS is OPERABLE. ①

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the CRE~~F~~VS 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. ①

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~~ hand switch and the interconnecting wiring to the actuation logic cabinet. ②

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 CRE~~F~~VS portion of these functions are ① 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 CRE~~F~~VS function is affected, the Conditions ① applicable to their SI function need not be entered. The less restrictive Actions specified for inoperability of the CRE~~F~~VS Functions ① specify sufficient compensatory measures for this case.

3. Control Room Radiation

The LCO specifies ~~two required Control Room Atmosphere Radiation Monitors and~~ two required Control Room Air Intake Radiation ⑤ Monitors to ensure that the radiation monitoring instrumentation necessary to initiate the CRE~~F~~VS remains OPERABLE. ①

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY ~~may~~ also requires correct valve lineups, and 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~~.

BASES

LCO (continued)

4. Safety Injection

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

APPLICABILITY

The CRE~~F~~ V S Functions must be OPERABLE in MODES 1, 2, 3, 4, 5, and 6, 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. ① ④ ②

The Applicability for the CRE~~F~~ V S 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. 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 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. ②

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.

A.1

Condition A applies to the actuation logic train Function of the CRE~~F~~ V S, the radiation monitor channel Functions, and the manual channel Functions. ①

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 CRE~~F~~VS train must be placed in the ~~emergency radiation protection~~ recirculation mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation. ① ⑤

~~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.~~ ⑤

B.1.1, B.1.2, and B.2

Condition B applies to the failure of two CRE~~F~~VS actuation trains, two radiation monitor channels, or two manual channels. The first Required Action is to place one CRE~~F~~VS train in the ~~emergency [radiation protection]~~ recirculation 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 CRE~~F~~VS 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. ① ① ⑤ ①

Alternatively, both trains may be placed in the ~~emergency [radiation protection]~~ recirculation mode. This ensures the CRE~~F~~VS function is performed even in the presence of a single failure. ⑤ ①

~~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.~~ ⑤

BASES

ACTIONS (continued)

C.1 and C.2

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.

D.1

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met when ~~[recently]~~ irradiated fuel assemblies are being moved. Movement of ~~[recently]~~ irradiated fuel assemblies must be suspended immediately to reduce the risk of accidents that would require CRE~~F~~S actuation. ④ ①

V

E.1

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~~ fuel handling accident. ②

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 CRE~~F~~S Actuation Functions. ①

V

SR 3.3.7.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 of 12 hours 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.~~ ⑥

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑦
~~--~~]

SR 3.3.7.2

A COT is performed 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 CRE~~F~~VS 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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ~~[The Frequency of 92 days is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.~~ ① ⑥

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

⑦

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

⑤

~~SR 3.3.7.3~~

~~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.~~

~~OR~~

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.7.4~~ ⑤

~~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.~~

~~OR~~

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

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

~~[~~ SR 3.3.7.~~5~~ 3 ② ⑤

SR 3.3.7.~~5~~ 3 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.~~ ⑥

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑦

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~~ 4 ② ⑤

SR 3.3.7.~~6~~ 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 Surveillance interval is justified in Reference 1.~~

~~OR~~ ⑥

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

~~----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑦

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the ESFAS Instrumentation.~~]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.~~7~~5 ⑤

SR 3.3.7.~~7~~5 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.~~

~~OR~~ ⑥

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑦

SR 3.3.7.~~8~~6 ⑤

SR 3.3.7.~~8~~6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions. 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.).

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 of 18 months is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~ ⑥

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑦
~~---]~~

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 3.3.7.~~9~~ 7 ⑤

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.

There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑥

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑦

REFERENCES ~~1. WCAP-15376, Rev. 0, October 2000.~~ None ⑤

B 3.3 INSTRUMENTATION

B 3.3.7~~A~~ Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~VS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The CRE~~F~~VS provides an enclosed control room environment from which the unit can be operated following an uncontrolled release of radioactivity. ① During normal operation, the ~~Auxiliary~~ Control Building Ventilation System ② provides control room ventilation. Upon receipt of an actuation signal, the CRE~~F~~VS initiates filtered ventilation and pressurization of the control room. ① This system is described in the Bases for LCO 3.7.10, "Control Room Emergency ~~Filtration~~ Ventilation System (CREVS)." ③

The actuation instrumentation consists of redundant radiation monitors in the air intake~~s and control room area~~. A high radiation signal from any ~~of these~~ detector~~s~~ will initiate ~~both~~ its associated train~~s~~ of the CRE~~F~~VS. ② The control room operator can also initiate CRE~~F~~VS trains by manual switches in the control room. The CRE~~F~~VS is also actuated by a safety injection (SI) signal. ① The SI Function is discussed in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation."

APPLICABLE SAFETY ANALYSES

The control room must be kept habitable for the operators stationed there during accident recovery and post accident operations.

The CRE~~F~~VS acts to terminate the supply of unfiltered outside air to the control room, initiate filtration, and pressurize the control room. ① 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.

In MODES 1, 2, 3, and 4, the radiation monitor actuation of the CRE~~F~~VS is ① a backup for the SI signal actuation. This ensures initiation of the CRE~~F~~VS during a loss of coolant accident or ~~steam generator tube rupture~~ main steam line break. ①

The radiation monitor actuation of the CRE~~F~~VS in MODES 5 and 6, and ① during movement of ~~[recently]~~ irradiated fuel assemblies are the primary ④ means to ensure control room habitability in the event of a fuel handling ~~or waste gas decay tank rupture~~ accident. ②

The CRE~~F~~VS actuation instrumentation satisfies Criterion 3 of ① 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CRE~~F~~VS is OPERABLE. ①

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the CRE~~F~~VS 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. ①

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~~ hand switch and the interconnecting wiring to the actuation logic cabinet. ②

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 CRE~~F~~VS 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 CRE~~F~~VS function is affected, the Conditions applicable to their SI function need not be entered. The less restrictive Actions specified for inoperability of the CRE~~F~~VS Functions specify sufficient compensatory measures for this case. ① ① ①

3. Control Room Radiation

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 CRE~~F~~VS remains OPERABLE. ⑤ ①

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY ~~may~~ also requires correct valve lineups~~,~~ and 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~~.

BASES

LCO (continued)

4. Safety Injection

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

APPLICABILITY

The CRE~~F~~VS Functions must be OPERABLE in MODES 1, 2, 3, 4, 5, and 6, 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. ① ④ ②

The Applicability for the CRE~~F~~VS 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. 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 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. ②

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.

A.1

Condition A applies to the actuation logic train Function of the CRE~~F~~VS, the radiation monitor channel Functions, and the manual channel Functions. ①

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 CRE~~F~~VS train ① must be placed in the ~~emergency radiation protection~~ recirculation mode of operation. ⑤ This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation.

~~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.~~ ⑤

<u>B.1.1, B.1.2, and B.2</u>

Condition B applies to the failure of two CRE~~F~~VS actuation trains, two ① radiation monitor channels, or two manual channels. The first Required Action is to place one CRE~~F~~VS train in the ~~emergency [radiation protection]~~ recirculation ① ⑤ 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 CRE~~F~~VS train made ① 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.

Alternatively, both trains may be placed in the ~~emergency [radiation protection]~~ recirculation mode. This ensures the CRE~~F~~VS function is performed even in ⑤ ① the presence of a single failure.

~~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.~~ ⑤

BASES

ACTIONS (continued)

C.1 and C.2

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.

D.1

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met when ~~[recently]~~ irradiated fuel assemblies are being moved. Movement of ~~[recently]~~ irradiated fuel assemblies must be suspended immediately to reduce the ④ risk of accidents that would require CRE~~F~~VS actuation. ①

E.1

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~~ fuel handling accident. ②

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 CRE~~F~~VS Actuation Functions. ①

SR 3.3.7.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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 of 12 hours 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.~~ ⑥

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑦

SR 3.3.7.2

A COT is performed 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 CRE~~F~~S 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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ~~[The Frequency of 92 days is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.~~ V ① ⑥

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑦

~~SR 3.3.7.3~~

~~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.~~

~~OR~~ ⑤

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.7.4~~ ⑤

~~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.~~

~~OR~~

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

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

3

~~[~~ SR 3.3.7.~~5~~ ② ⑤

3

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.~~ ⑥

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--~~ ~~]~~ ⑦

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~~4 ② ⑤

SR 3.3.7.~~6~~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 Surveillance interval is justified in Reference 1.~~ ⑥

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--~~ ~~]~~ ⑦

The SR is modified by a Note stating that the Surveillance is only applicable to the master relays of the ESFAS Instrumentation. ~~]~~ ②

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7. 5 ~~7~~ ⑤

SR 3.3.7. 5 ~~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.~~ ⑥

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑦

SR 3.3.7. 6 ~~8~~ ⑤

SR 3.3.7. 6 ~~8~~ is the performance of a TADOT. This test is a check of the Manual Actuation Functions. 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.).

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 of 18 months is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.~~ ⑥

~~OR~~

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

~~----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑦
~~--]~~

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 3.3.7.~~9~~7 ⑤

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.

There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑥

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

⑦

REFERENCES ~~1. WCAP-15376, Rev. 0, October 2000.~~ None ⑤

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.7 BASES, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS B 3.3.7B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Control Room Emergency Filtration System (CREFS) Actuation Instrumentation" to " Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have a CREFS.

2. 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.

3. Changes are made to be consistent with changes made to other Specifications.

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

5. Changes are made to be consistent with changes made to the Specification.

6. ISTS SR 3.3.7.1, SR 3.3.7.2, SR 3.3.7.5, SR 3.3.7.6, SR 3.3.7.7, SR 3.3.7.8, and SR 3.3.7.9 Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 8

ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

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

3/4.3.3 MONITORING INSTRUMENTATION

Auxiliary Building Gas Treatment System (ABGTS) ACTUATION

A02

~~RADIATION MONITORING~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

Auxiliary Building Gas Treatment System (ABGTS) actuation

A02

LCO 3.3.8

3.3.3.1 The ~~radiation monitoring~~ instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3-6.

Applicability

ACTION:

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~

M01

ACTION B

b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3-6.

ACTIONS Note 1

c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

ABGTS actuation

A02

SR Table Note

4.3.3.1 Each ~~radiation monitoring~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-3.

CHANNEL OPERATIONAL TEST (COT)

M02

A01

Table 3.3.8-1

TABLE 3.3-6

Auxiliary Building Gas Treatment System (ABGTS) — A02

~~RADIATION MONITORING~~ INSTRUMENTATION

LA01

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION
Add proposed Table 3.3.8-1 Function 1 — M03					
1. AREA MONITOR — A01					
Function 2 a. Spent Fuel ~~Storage~~ Pool Area	1 (b)	*	≤ 151 mR/hr	~~10^{-1} - 10^{4} mR/hr~~ LA01	26
2. PROCESS MONITORS — M04					
a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤ 8.5x 10^{-3} µCi/cc	10 - 10^{7} cpm	28
b. Containment					
i. Deleted					
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29

See ITS 3.3.6

See ITS 3.4.15

See ITS 3.3.7

Add proposed Table 3.3.8-1 Function 3 — M05

Add proposed Table 3.3.8-1 Footnote (b) — M04

Applicability * ~~With fuel in the storage pool or building~~

During movement of recently irradiated fuel assemblies in the auxiliary building — L01

** Equivalent to 1.0 x 10^{-5} µCi/cc. — See ITS 3.3.7

A01

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

Add proposed ACTION Note 2 A03

Add proposed ACTION B M06

ACTION B

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, ~~perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.~~

Add proposed ACTION C for Function 2 M07

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (MODE 6) and 3.3.2.1 (MODES 1, 2, 3, and 4).

See ITS 3.3.6

ACTION 29 -

a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two channels inoperable, within 1 hour initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Or

place both trains in the recirculation mode of operation within one hour.

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, suspend core alterations and suspend movement of irradiated fuel assemblies.

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

See ITS 3.3.7

Add proposed ACTIONS A, B, C, and D for Function 1 M03

A01

Table 3.3.8-1

TABLE 4.3-3

Auxiliary Building Gas Treatment System (ABGTS) A02

~~RADIATION MONITORING~~ INSTRUMENTATION SURVEILLANCE REQUIREMENTS

COT M02

Add proposed SR 3.3.8.3 for Table 3.3.8-1 Function 1 at a Frequency of ~~18 months~~ M03

In accordance with the Surveillance Frequency Control Program LA02

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~ COT	MODES FOR WHICH SURVEILLANCE REQUIRED
1. AREA MONITOR				
Function 2 a. Fuel ~~Storage~~ Spent Pool Area	~~S~~ SR 3.3.8.1	~~R~~ SR 3.3.8.4	~~Q~~ SR 3.3.8.2	*
2. PROCESS MONITORS				
a. Containment Purge Air Exhaust	S	R	Q	1, 2, 3, 4 & 6
b. Containment				
i. Deleted				
ii. Particulate Activity				
RCS Leakage Detection	S	R	Q	1, 2, 3, & 4
c. Control Room Isolation	S	R	Q	ALL MODES

A01

See ITS 3.3.6

See ITS 3.4.15

See ITS 3.3.7

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*~~With fuel in the storage pool or building~~.

During movement of recently irradiated fuel assemblies in the auxiliary building L01

A01

INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Auxiliary Building Gas Treatment System (ABGTS) Actuation A02

~~RADIATION MONITORING~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

Auxiliary Building Gas Treatment System (ABGTS) actuation A02

LCO 3.3.8 3.3.3.1 The ~~radiation monitoring~~ instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

Applicability APPLICABILITY: As shown in Table 3.3-6.

ACTION:

a. ~~With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.~~ M01

ACTION B b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3-6.

ACTIONS Note 1 c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

ABGTS actuation A02

SR Table Note 4.3.3.1 Each ~~radiation monitoring~~ instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-3.

CHANNEL OPERATIONAL TEST (COT) M02

ITS

A01

ITS 3.3.8

Table 3.3.8-1

TABLE 3.3-6
~~RADIATION MONITORING~~ INSTRUMENTATION

Auxiliary Building Gas Treatment System (ABGTS) A02

LA01

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	~~MEASUREMENT RANGE~~	ACTION
1. AREA MONITOR					
a. Spent Fuel ~~Storage~~ Pool Area	1 (b)	*	≤151 mR/hr	~~10^{-1} - 10^{4} mR/hr~~	26
2. PROCESS MONITORS					
a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤8.5 x 10^{-3} µCi/cc	10 - 10^{7} cpm	28
b. Containment					
i. Deleted					
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29

Add proposed Table 3.3.8-1 Function 1 M03

Function 2

Spent A01

(b) M04

LA01

See ITS 3.3.6

See ITS 3.4.15

See ITS 3.3.7

Add proposed Table 3.3.8-1 Function 3 M05

Add proposed Table 3.3.8-1 Footnote (b) M04

Applicability

* ~~With fuel in the storage pool or building~~

During movement of recently irradiated fuel assemblies in the auxiliary building L01

** Equivalent to 1.0 x 10^{-5} µCi/cc.

See ITS 3.3.7

A01

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

Add proposed ACTION Note 2 A03

Add proposed ACTION B M06

ACTION B

ACTION 26 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, ~~perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours~~.

Add proposed ACTION C for Function 2 M07

ACTION 27 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

See ITS 3.4.15

ACTION 28 - With the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9 (MODE 6) and 3.3.2 (MODES 1, 2, 3, and 4).

See ITS 3.3.6

ACTION 29 -

a. With one channel inoperable, place the associated control room emergency ventilation system (CREVS) train in recirculation mode of operation within 7 days or be at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two channels inoperable, within 1 hour initiate and maintain operation of one CREVS train in the recirculation mode of operation and enter the required Actions for one CREVS train made inoperable by inoperable CREVS actuation instrumentation.

Or

place both trains in the recirculation mode of operation within one hour.

If the completion time of Action 29b cannot be met in Modes 1, 2, 3, and 4, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

If the completion time of Action 29b cannot be met during the movement of irradiated fuel assemblies, suspend core alterations and suspend movement of irradiated fuel assemblies.

If the completion time of Action 29b cannot be met in Modes 5 and 6, initiate action to restore one CREVS train.

See ITS 3.3.7

Add proposed ACTIONS A, B, C, and D for Function 1 M03

ITS

A01

ITS 3.3.8

Table 3.3.8-1

TABLE 4.3-3

Auxiliary Building Gas Treatment System (ABGTS) — A02

~~RADIATION MONITORING~~ INSTRUMENTATION SURVEILLANCE REQUIREMENTS

COT — M02

Add proposed SR 3.3.8.3 for Table 3.3.8-1 Function 1 at a Frequency of ~~18 months~~ — M03

In accordance with the Surveillance Frequency Control Program — LA02

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	~~CHANNEL FUNCTIONAL TEST~~	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. AREA MONITOR				
Function 2 — a. Fuel ~~Storage~~ Pool Area (Spent)	~~S~~ SR 3.3.8.1	~~R~~ SR 3.3.8.4	~~Q~~ SR 3.3.8.2	*
2. PROCESS MONITORS (A01)				
a. Containment Purge Air Exhaust	S	R	Q	1, 2, 3, 4 & 6
b. Containment				
i. Deleted				
ii. Particulate Activity RCS Leakage Detection	S	R	Q	1, 2, 3 & 4
c. Control Room Isolation	S	R	Q	ALL MODES

See ITS 3.3.6 (item 2.a)

See ITS 3.4.15 (item 2.b)

See ITS 3.3.7 (item 2.c)

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* ~~With fuel in the storage pool or building~~.

During movement of recently irradiated fuel assemblies in the auxiliary building — L01

DISCUSSION OF CHANGES
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.3.3.1 requires, in part, the Radiation Monitoring Instrumentation channels to be OPERABLE. CTS 3.3.3.1 ACTIONS a and b provide the Required Actions and associated Completion Time for when the Radiation Monitoring Instrumentation is inoperable. CTS 4.3.3.1 requires, in part, that each Radiation Monitoring Instrumentation channel be demonstrated OPERABLE.
CTS Table 3.3-6 lists the instruments required to be OPERABLE, the Applicable MODE, and the appropriate ACTIONS to take for inoperable Radiation Monitoring Instrumentation. CTS Table 4.3-3 provides the Surveillance Requirements for the Radiation Monitoring Instrumentation. ITS LCO 3.3.8 requires that the Auxiliary Building Gas Treatment System (ABGTS) Actuation Instrumentation for each Function in Table 3.3.8-1 to be OPERABLE. ITS 3.3.8 ACTIONS A, B, C, and D provide the Required Actions and associated Completion Time for when the ABGTS actuation instrumentation is inoperable. ITS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.3, and SR 3.3.8.4 provide the testing requirements for each ABGTS actuation instrument in Table 3.3.8-1. ITS Table 3.3.8-1 lists the instruments that are required to be OPERABLE, the Applicable MODE, and the appropriate ACTIONS to take for inoperable ABGTS instrumentation. This changes the CTS by having a separate Specification for the ABGTS actuation instrumentation in lieu of including it in the Radiation Monitoring Instrumentation Specifications.

This change is acceptable because the technical requirements for the Radiation Monitoring Instrumentation are maintained with the change in format. The ABGTS Actuation Instrumentation continues to require the OPERABILITY of the Radiation Monitoring instrumentation. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 The ACTIONS for CTS 3.3.3.1 do not contain a Note allowing separate Condition entry for each Function. ITS 3.3.8 ACTIONS Note 2 states that separate Condition entry is allowed for each Function. This changes the CTS by specifically allowing separate Condition entry for each Function in ITS Table 3.3.8-1.

This change is acceptable because it clearly states the current requirement. The CTS considers each Radiation Monitoring Instrument Function to be separate and independent. This change is designated as administrative because it does not result in a technical change to the CTS.

DISCUSSION OF CHANGES
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

MORE RESTRICTIVE CHANGES

M01 CTS 3.3.3.1 ACTION a requires that when a radiation monitor channel alarm/trip setpoint exceeds the value shown in Table 3.3-6, to adjust the setpoint within 4 hours or declare the channel inoperable. ITS 3.3.8 does not contain an ACTION for adjusting a setpoint that exceeds the required valued. Instead, ITS 3.3.8 ACTION B requires that when one required radiation monitoring channel is inoperable (i.e., setpoint not within tolerance) to enter the applicable Required Actions immediately. This changes the CTS by not allowing adjustment of the setpoint in 4 hours before declaring the channel inoperable.

The purpose of CTS 3.3.3.1 ACTION a is to allow adjustment of the radiation monitor setpoint to within limits before declaring the channel inoperable. Although ITS does not include this allowance, restoration such that the LCO is met, is always an option. This change is acceptable because the channel requirements in ITS 3.3.8 will ensure that the required radiation monitoring channel is OPERABLE. The proposed ITS ACTION for when one channel is inoperable will ensure that the Required Actions and Completion Times used establish remedial measures that when taken minimize risk associated with continued operation. This change is designated as more restrictive because more stringent Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M02 CTS 4.3.3.1 requires, in part, that the Radiation Monitoring Instrumentation on Table 4.3-3 be demonstrated OPERABLE by performance of CHANNEL FUNCTIONAL TEST. CTS Table 4.3-3 Instrument 1.a (Area Monitor – Fuel Storage Pool Area) requires a CHANNEL FUNCTIONAL TEST. ITS Table 3.3.8-1 Function 2 (Spent Fuel Pool Area Radiation Monitor) requires the performance of ITS SR 3.3.8.2. ITS SR 3.3.8.2 requires the performance of a CHANNEL OPERATIONAL TEST (COT). This changes the CTS by requiring a COT instead of a CHANNEL FUNCTIONAL TEST.

This change is acceptable because the COT continues to perform a test similar to the current CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for Digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. This does not include the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The COT provides a similar test and includes adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires additional acceptance criteria that is not required in the CTS.

DISCUSSION OF CHANGES
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

M03 CTS 3.3.3.1 does not contain a requirement for the manual initiation of ABGTS. ITS Table 3.3.8-1 Function 1 requires two channels of manual initiation for ABGTS to be OPERABLE in MODES 1, 2, 3, and 4 and during movement of recently irradiated fuel assemblies in the auxiliary building. ITS Table 3.3.8-1 Function 1 also requires performance of SR 3.3.8.3. ITS SR 3.3.8.3 requires performance of a TADOT every 18 months. (See DOC LA02 for the discussion related to moving the Surveillance Frequency to the Surveillance Frequency Control Program.) Additionally, ITS SR 3.3.8.3 contains a Note stating that verification of the setpoint is not required. Furthermore, ITS 3.3.8 contains compensatory actions to take if one or both ABGTS manual initiation channels are inoperable. ITS 3.3.8 ACTION A requires, in part, that with one manual initiation channel inoperable, to place one ABGTS train in operation. ITS 3.3.8 ACTION B requires, in part, that with two manual initiation channels inoperable, to place one train of ABGTS in operation immediately and to immediately enter the applicable Conditions and Required Actions of LCO 3.7.12. ITS 3.3.8 ACTION C requires that when the Required Action and associated Completion Time for Condition A or B are not met during movement of recently irradiated fuel assemblies in the auxiliary building, to immediately suspend movement of recently irradiated fuel assemblies in the auxiliary building. ITS 3.3.8 ACTION D requires that when the Required Action and associated Completion Time for Condition A or B are not met in MODE 1, 2, 3, or 4, to be in MODE 3 in 6 hours and in MODE 5 in 36 hours. This changes the CTS by requiring a new Function, Applicability, ACTIONS and Surveillance Requirement for the manual initiation of ABGTS.

The purpose the ABGTS manual initiation is to allow the operator to initiate ABGTS at any time. This change is acceptable because the addition of ABGTS manual initiation requirements will ensure that proper redundancy is maintained. This change is designated as more restrictive because additional requirements are being added to the ITS that were not required in the CTS.

M04 CTS Table 3.3-6 Minimum Channels OPERABLE column requires one channel for Functional Unit 1.a (Area Monitor, Fuel Storage Pool Area). ITS Table 3.3.8-1 Required Channels column requires one channel OPERABLE for Function 2 (Spent Fuel Pool Area Radiation Monitor) modified by footnote (b) that states the Required Channel shall be associated with the ABGTS train required OPERABLE by LCO 3.7.12. This changes the CTS by specifying that the required Spent Fuel Pool Area Radiation Monitor shall be associated with the OPERABLE ABGTS train.

The purpose of CTS Table 3.3-6 Functional Unit 1.a (Area Monitor, Fuel Storage Pool Area) is to provide an indication of abnormal radiation levels and actuate ABGTS if necessary. This change is acceptable because it ensures the required radiation monitoring channel is associated with the OPERABLE ABGTS train. Thus if the radiation monitor's setpoint is exceeded a train of ABGTS will be available to start to mitigate any potential release. This change is designated as more restrictive because additional limitations are placed on what constitutes a required channel.

DISCUSSION OF CHANGES
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

M05 CTS 3.3.3.1 states that the Radiation Monitoring Instrumentation channels shown in Table 3.3-6 shall be OPERABLE. CTS Table 3.3-6 lists the radiation monitor required for the fuel storage pool area. ITS LCO 3.3.8 states that the ABGTS actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE. ITS Table 3.3.8-1 lists the required ABGTS instrument Functions which includes Containment Isolation – Phase A (Function 3). ITS Table 3.3.8-1 Function 3 provides a statement referring to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a for all initiation functions and requirements. This changes the CTS by specifying an additional instrumentation actuation Function for the ABGTS.

The purpose of CTS 3.3.3.1 and Table 3.3-6 is to specify the required Functions and instrumentation to ensure the ABGTS actuates as assumed in the accident analysis. The Containment Isolation – Phase A signal from the ESFAS provides an actuation of ABGTS that is credited in the loss of coolant accident. This change is acceptable because it will result in a more complete listing of the Functions that actuate ABGTS. The inclusion of the Containment Isolation – Phase A signal with the other credited ABGTS instrumentation provides a complete list of the required ABGTS instrumentation with a common set of Actions to assure the unit is placed in a safe condition when the required instrumentation is inoperable. Therefore, the proposed change ensures the radioactive materials in the Auxiliary Building Secondary Containment Enclosure atmosphere following an accident are filtered and adsorbed prior to being exhausted to the environment. This change is designated as more restrictive because more ABGTS actuation instrumentation will be required in ITS than was required in CTS.

M06 CTS Table 3.3-6 "MINIMUM CHANNELS OPERABLE" column, for Instrument 1.a, only requires one Area Monitor – Fuel Storage Pool Area channel to be OPERABLE with fuel in the storage pool or building. CTS Table 3.3-6 ACTION 26 applies when the number of OPERABLE channels is less than required by the Minimum Channels OPERABLE requirement. ACTION 26 requires the performance of an area survey of the monitored area with portable monitoring instrumentation at least once per 24 hours. ITS Table 3.3.8-1 Function 2 requires one Spent Fuel Pool Area Radiation Monitor to be OPERABLE during movement of irradiated fuel assemblies in the auxiliary building. ITS 3.3.8 ACTION B requires that when one required channel is inoperable, to place one ABGTS train in operation and to enter the applicable Conditions and Required Action for LCO 3.7.12 for one train made inoperable by inoperable actuation instrumentation. This changes the CTS by requiring more stringent ACTIONS for the inoperable channels. (See DOC L01 for a discussion on the change to the Applicability.)

The purpose of the Spent Fuel Pool Area Radiation Monitor is to provide indication of high radiation in the Fuel Storage Pool area. This change is acceptable because when one required Spent Fuel Pool Area Radiation Monitor channel is inoperable, placing the ABGTS in operation accomplishes the Spent Fuel Pool Area Radiation Monitor instrument function. Additionally, entering the Conditions and Required Actions for the ABGTS Specification (ITS 3.7.12) will allow 7 days to restore one inoperable ABGTS train to OPERABLE status. This change is designated as more restrictive because more stringent Required Actions and Completion Times are required in the ITS than were required in the CTS.

M07 CTS 3.3.3.1, Table 3.3-6, ACTION 26, is associated with Functional Unit 1.a (Area Monitor, Fuel Storage Pool Area) and requires that with the number of OPERABLE channels less than required by the Minimum Channels OPERABLE requirement, to perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours. ITS 3.3.8 ACTION C requires if the Required Action and associated Completion Time for Condition B, one required radiation monitor inoperable, is not met during movement of recently irradiated fuel assemblies in the auxiliary building, to immediately suspend movement of recently irradiated fuel assemblies in the auxiliary building. This changes the CTS by adding explicit Required Actions to exit the MODE of Applicability if remedial action cannot be completed within the allotted time.

The purpose of Required Actions is 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 acceptable because it provides Required Actions to exit the MODE of Applicability that must be taken if the time allotted to establish the required remedial measures or complete the repair of inoperable features is exceeded. This change is designated as more restrictive because more stringent Required Actions and Completion Times are required in the ITS than were required in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.3-6 for Radiation Monitoring Instrumentation has five columns stating various requirements for the Radiation Monitoring Instrumentation. These columns are labeled "MINIMUM CHANNELS OPERABLE," "APPLICABLE MODES," ALARM/TRIP SETPOINT," "MEASUREMENT RANGE," AND "ACTION." ITS Table 3.3.8-1 does not contain the "MEASUREMENT RANGE" column. This changes the CTS by moving the information of the "MEASUREMENT RANGE" column to the Bases.

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

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS Table 4.3-3 Instrument 1.a requires a CHANNEL CHECK every shift (12 hours), a CHANNEL FUNCTIONAL TEST every quarter (92 days), and a CHANNEL CALIBRATION every refueling cycle (18 months). In addition, SR 3.3.8.3 has been added for ITS Table 3.3.8-1 Function 1 with a Frequency of 18 months as discussed in DOC M03. ITS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.3, and SR 3.3.8.4 require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-6 Instrument 1.a (Area Monitor – Fuel Storage Pool Area) and CTS Table 4.3-3 Instrument 1.a (Area Monitor – Fuel Storage Pool Area) state that the requirements of the Fuel Storage Pool Area Monitors are applicable when there is fuel in the storage pool or building. ITS Table 3.3.8-1 Function 2 states that the Applicable MODE is during movement of recently irradiated fuel assemblies in the auxiliary building. This changes the CTS by only requiring the Spent Fuel Pool Monitors to be OPERABLE when there is a potential for a fuel handling accident in the auxiliary building (i.e., during movement of recently irradiated fuel assemblies in the auxiliary building).

DISCUSSION OF CHANGES
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

The purpose of CTS Table 3.3-6 Functional Unit 1.a is to ensure that the Fuel Storage Pool Area Monitors are OPERABLE to mitigate the consequences of a fuel handling accident. This change is acceptable because the requirements continue to ensure that the structures, system and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. The Sequoyah Nuclear Plant (SQN) fuel handling analysis for the auxiliary building has been analyzed using the methodology from Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors." The SQN fuel handling analysis assumes, in part, that the accident occurs 100 hours after a plant shutdown, radioactive decay during the interval between shutdown and placement of the first spent fuel assembly into the spent fuel pool is taken into account, and a single fuel assembly is damaged with acceptable results. The ITS Bases define a recently irradiated fuel assembly as having occupied part of a critical reactor within the previous 100 hours. Therefore, the ITS imposes the controls on the ABGTS Actuation Instrumentation during movement of recently irradiated fuel assemblies in the auxiliary building. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

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

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.8~~A~~

3.3 INSTRUMENTATION

3.3.8~~A~~ ~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (~~FBACS~~ ABGTS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.1 LCO 3.3.8 The ~~FBACS~~ ABGTS actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE. ①

3.3.3.1 Applicability APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

---NOTES---

3.3.3.1 ACTION c 1. LCO 3.0.3 is not applicable.

DOC A03 2. Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M03	A. One ~~or more Functions with one~~ manual initiation channel ~~or train~~ inoperable.	A.1 Place one ~~FBACS~~ ABGTS train in operation.	7 days	② ①
DOC M03	B. ~~One or more Functions with two~~ Two manual initiation channels ~~or two trains~~ inoperable.	B.~~1.~~1 Place one ~~FBACS~~ ABGTS train in operation.	Immediately	③ ① ②
		AND		
3.3.3.1 ACTION b Table 3.3-6 ACTION 26	OR One required radiation monitoring channel inoperable.	B.~~1.~~2 Enter applicable Conditions and Required Actions of LCO 3.7.~~13~~12, "~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (~~FBACS~~ ABGTS)," for one train made inoperable by inoperable actuation instrumentation.	Immediately	② ③ ④ ①
		~~OR~~		
		~~B.2 Place both trains in emergency [radiation protection] mode.~~	~~Immediately~~	③

CTS

ACTIONS (continued)

	CONDITION		REQUIRED ACTION	COMPLETION TIME	
DOC M03 DOC M07	C. Required Action and associated Completion Time for Condition A or B not met during movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building.	C.1	Suspend movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building.	Immediately	⑤ ② ⑤ ②
DOC M03	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	⑤
		AND			
		D.2	Be in MODE 5.	36 hours ~~]~~	⑤

SURVEILLANCE REQUIREMENTS

---NOTE---

4.3.3.1 Refer to Table 3.3.8-1 to determine which SRs apply for each ~~FBACS~~ ABGTS Actuation Function. ①

	SURVEILLANCE		FREQUENCY	
Table 4.3-3 Instrument 1.a	SR 3.3.8.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.8~~A~~ ①

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY	
Table 4.3-3 Instrument 1.a	SR 3.3.8.2	Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
	~~SR 3.3.8.3~~	~~[Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~	⑤
DOC M03	SR 3.3.8.~~4~~ 3	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ⑥ ⑥

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.8A ①

SURVEILLANCE REQUIREMENTS (continued)

Table 4.3-3
Instrument 1.a

SURVEILLANCE	FREQUENCY
SR 3.3.8.~~5~~ 4 Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑤ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.8~~A~~ ①

Table 3.3.8-1 (page 1 of 1)
~~FBACS~~ ABGTS Actuation Instrumentation ①

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
DOC M03	1. Manual Initiation	~~[~~1,2,3,4~~]~~, (a)	2	SR 3.3.8.~~4~~ 3	NA	⑤
	~~2. [Automatic Actuation Logic and Actuation Relays~~	~~1,2,3,4, (a)~~	~~2 trains~~	~~SR 3.3.8.3~~	~~NA]~~	⑤
Table 3.3-6 Instrument 1.a	~~3~~ 2. Spent Fuel Pool Area ~~Building~~ Radiation Monitor					⑤ ④
	~~a. Gaseous~~	~~[1,2,3,4],~~ (a)	~~[2]~~ 1 (b)	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.~~5~~ 4	≤ ~~[2]~~ 151 mR/hr	⑤ ⑦
	~~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~~	⑧
DOC M05	3. Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a for all initiation functions and requirements.				

(a) During movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building. ⑤ ④

DOC M04 (b) Required Channel shall be associated with the ABGTS train required OPERABLE per LCO 3.7.12 ②

3.3 INSTRUMENTATION

3.3.8~~A~~ ~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (~~FBACS~~ ABGTS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

3.3.3.1 LCO 3.3.8 The ~~FBACS~~ ABGTS actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE. ①

3.3.3.1 Applicability APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

---NOTES---

3.3.3.1 ACTION c 1. LCO 3.0.3 is not applicable.

DOC A03 2. Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M03	A. One ~~or more~~ manual initiation ~~Functions with one~~ channel ~~or train~~ inoperable.	A.1 Place one ~~FBACS~~ ABGTS train in operation.	7 days	② ①
DOC M03	B. ~~One or more~~ Two manual initiation ~~Functions with two~~ channels ~~or two trains~~ inoperable.	B.~~1.~~1 Place one ~~FBACS~~ ABGTS train in operation.	Immediately	③ ① ②
3.3.3.1 ACTION b Table 3.3-6 ACTION 26	OR One required radiation monitoring channel inoperable.	AND		
		B.~~1.~~2 Enter applicable Conditions and Required Actions of LCO 3.7.~~13~~ 12, "~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (~~FBACS~~ ABGTS)," for one train made inoperable by inoperable actuation instrumentation.	Immediately	② ③ ④ ①
		~~OR~~		
		~~B.2 Place both trains in emergency [radiation protection] mode.~~	~~Immediately~~	③

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.8~~A~~

ACTIONS (continued)

CTS	CONDITION	REQUIRED ACTION		COMPLETION TIME	
DOC M03 DOC M07	C. Required Action and associated Completion Time for Condition A or B not met during movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building.	C.1	Suspend movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building.	Immediately	⑤ ② ⑤ ②
DOC M03	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	⑤
		AND			
		D.2	Be in MODE 5.	36 hours ~~]~~	⑤

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------

4.3.3.1 Refer to Table 3.3.8-1 to determine which SRs apply for each ~~FBACS~~ ABGTS Actuation Function. ①

CTS	SURVEILLANCE		FREQUENCY	
Table 4.3-3 Instrument 1.a	SR 3.3.8.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
Table 4.3-3 Instrument 1.a	SR 3.3.8.2	Perform COT.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
	~~SR 3.3.8.3~~	~~[Perform ACTUATION LOGIC TEST.~~	~~[31 days on a STAGGERED TEST BASIS~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]]~~	⑤
DOC M03	SR 3.3.8.~~4~~ 3	------------------------------NOTE------------------------------ Verification of setpoint is not required. --- Perform TADOT.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑤ ⑥ ⑥

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.8~~A~~ ①

SURVEILLANCE REQUIREMENTS (continued)

Table 4.3-3
Instrument 1.a

SURVEILLANCE	FREQUENCY
SR 3.3.8.~~5~~ 4 Perform CHANNEL CALIBRATION.	~~[[18] months~~ ⑤ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

CTS

~~FBACS~~ ABGTS Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①
3.3.8~~A~~

Table 3.3.8-1 (page 1 of 1)
~~FBACS~~ ABGTS Actuation Instrumentation ①

	FUNCTION	APPLICABLE MODES OR SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT	
DOC M03	1. Manual Initiation	~~[~~1,2,3,4~~]~~, (a)	2	SR 3.3.8.~~4~~ 3	NA	⑤
	~~2. [Automatic Actuation Logic and Actuation Relays~~	~~1,2,3,4, (a)~~	~~2 trains~~	~~SR 3.3.8.3~~	~~NA]~~	⑤
Table 3.3-6 Instrument 1.a	~~3~~ 2. Spent Fuel ~~Building~~ Pool Area Radiation Monitor					⑤ ④
	~~a. Gaseous~~	~~[1,2,3,4],~~ (a)	~~[2]~~ 1 (b)	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.~~5~~ 4	≤ ~~[2]~~ 151 mR/hr	⑤ ⑦ ⑧
	~~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~~	
DOC M05	3. Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a for all initiation functions and requirements.				

(a) During movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building. ⑤ ④

DOC M04 (b) Required Channel shall be associated with the ABGTS train required OPERABLE per LCO 3.7.12 ②

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS 3.3.8B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation" to "Auxiliary Building Gas Treatment System (ABGTS) Actuation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have an FBACS.

2. 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.

3. ISTS 3.3.8 Required Action B.2 provides an option of placing both trains of the FBACS in the emergency [radiation protection] mode immediately when one or more Functions in ISTS Table 3.3.8-1 with two channels or two trains are inoperable. ITS 3.3.8 does not contain this Required Action since the ABGTS does not have an emergency mode of operation. Furthermore, ISTS 3.3.8 Required Actions B.1.1 and B.1.2 have been renumbered as ITS 3.3.8 Required Actions B.1 and B.2 to reflect the removal of the ISTS option. Additionally, the "AND" logic connector has been moved to the correct position due to the deletion of ISTS 3.3.8 Required Action B.2.

4. Changes are made to be consistent with changes made to ISTS LCO 3.7.13. The Title and the number for this specification were changed and are reflected in ITS 3.3.8.

5. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed, the proper plant specific information/value is inserted to reflect the current licensing basis, and subsequent items are renumbered as required.

6. ISTS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.4, and SR 3.3.8.5 (ITS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.3, and SR 3.3.8.4) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

7. ISTS Table 3.3.8-1 Function 3 specifies two Gaseous Radiation Monitors (Function 3.a) and two Particulate Radiation Monitors (Function 3.b) for the Fuel Storage Radiation Function. ITS Table 3.3.8-1 Function 2 only requires one Spent Fuel Pool Area Radiation Monitor for Table 3.3.8-1 Function 2. This change is acceptable because the fuel storage pool area radiation monitor is the monitor used in the current licensing bases for the ABGTS actuation.

8. Changes are made to ISTS Table 3.3.8-1 to reflect that the ABGTS receives a signal from Containment Isolation – Phase A which is part of ITS 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation."

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

B 3.3 INSTRUMENTATION

B 3.3.8~~A~~ ~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (~~FBACS~~ ABGTS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The ~~FBACS~~ ABGTS ensures that radioactive materials in the ~~fuel~~ auxiliary 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~~ 12, "~~Fuel Building Air Cleanup~~ Auxiliary Building Gas Treatment System (ABGTS)." The system initiates filtered ventilation of ~~the fuel building~~ INSERT 1 automatically following receipt of a spent fuel pool area high radiation signal ~~(gaseous or particulate)~~ or a ~~safety injection (SI)~~ Containment Phase A Isolation signal. Initiation may also be performed manually as needed from the main control room. ① ② ③ ④

High ~~gaseous and particulate~~ area radiation, ~~each~~ monitored by either of two monitors, provides ~~FBACS~~ ABGTS initiation. Each ~~FBACS~~ ABGTS 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~~ the required monitor or ~~an SI~~ Containment Phase A Isolation signal from the Engineered Safety Features Actuation System (ESFAS) initiates ~~fuel~~ auxiliary building isolation and starts the ~~FBACS~~ ABGTS. These actions function to prevent exfiltration of contaminated air by initiating filtered ventilation, which imposes a negative pressure on the ~~fuel building~~ Auxiliary Building Secondary Containment Enclosure (ABSCE). ~~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.~~ ④ ① ④ ① ④

APPLICABLE SAFETY ANALYSES

The ~~FBACS~~ ABGTS ensures that radioactive materials in the ~~fuel building~~ ABSCE 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~~ auxiliary building exhaust following a LOCA or fuel handling accident so that offsite doses remain within the limits specified in 10 CFR 100 (Ref. 1) for LOCA or 10 CFR 50.67 (Ref. 2) for fuel handling accident. ① ④ ② ④ ④

The ~~FBACS~~ ABGTS actuation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The LCO requirements ensure that instrumentation necessary to initiate the ~~FBACS~~ ABGTS is OPERABLE. ①

④ INSERT 1

exhaust air from the fuel handling area, ECCS pump rooms, and waste packaging area

BASES

LCO (continued)

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the ~~FBACS~~ ABGTS at any time by using ~~either of two switches in the control room~~ INSERT 2. This action will cause actuation of all components in the same manner as any of the automatic actuation signals. ① 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~~ hand switch and the interconnecting wiring to the actuation logic cabinet. ④

~~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.~~ ⑤

~~3~~ 2. Spent Fuel ~~Building~~ Pool Area Radiation ⑤ ④

The LCO specifies ~~two~~ one ~~required~~ Spent Fuel Pool Area ~~Gaseous~~ Radiation Monitor channel~~s and two required Particulate Radiation Monitor channels~~ to ensure that the radiation monitoring instrumentation necessary to initiate the ~~FBACS~~ ABGTS remains OPERABLE. INSERT 3 ④ ① ④

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. INSERT 4 ⑤

④ INSERT 2

one of two sets of manual initiation hand switches in the control room. Each Auxiliary Building Isolation (ABI) manual hand switch will initiate its respective train of ABGTS.

④ INSERT 3

One radiation monitor is dedicated to each train of ABGTS.

⑤ INSERT 4

The measurement range for the Spent Fuel Pool Area Monitors is 10^{-1} to 10^{4} mR/hr.

The Required Channels value is modified by a footnote stating that the Required Channel shall be associated with the ABGTS train required OPERABLE per LCO 3.7.12. This ensures a valid actuation signal will start a train of ABGTS.

3. Containment Isolation - Phase A

Refer to LCO 3.3.2, Function 3.a., for all initiating Functions and requirements.

BASES

LCO (continued)

Only the Trip Setpoint is specified for each ~~FBACS~~ ABGTS Function in the LCO. The Trip Setpoint limits account for instrument uncertainties, which are defined in ~~the Unit Specific Setpoint Calibration~~ TI-18, Radiation Monitoring Procedure (Ref. ~~2~~ 3). ① ④

APPLICABILITY

The manual ~~FBACS~~ ABGTS initiation must be OPERABLE in MODES [1, 2, 3, and 4] and when moving [recently] irradiated fuel assemblies in the ~~fuel~~ auxiliary building, to ensure the ~~FBACS~~ ABGTS operates to remove fission products associated with leakage after a LOCA or a fuel handling accident [involving handling recently irradiated fuel]. The automatic ~~FBACS~~ ABGTS 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. ① ② ④ ① ① ② ④

High radiation initiation of the ~~FBACS~~ ABGTS must be OPERABLE in any MODE during movement of [recently] irradiated fuel assemblies in the ~~fuel~~ auxiliary building to ensure automatic initiation of the ~~FBACS~~ ABGTS when the potential for the limiting fuel handling accident exists. [Due to radioactive decay, the ~~FBACS~~ ABGTS 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~~ 100 hours).] ① ② ④ ① ② ① ②

While in MODES 5 and 6 without fuel handling [involving handling recently irradiated fuel] in progress, the ~~FBACS~~ ABGTS instrumentation need not be OPERABLE since a fuel handling accident [involving handling recently irradiated fuel] cannot occur. ① ②

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. ④

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since recently 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 recently irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving recently 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. ⑤ ⑤

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.

<u>A.1</u>

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~~ channel cannot be restored to OPERABLE status, one ~~FBACS~~ ABGTS 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~~ 12. ⑤ ① ③

<u>B.~~1.~~1~~,~~ and B.~~1.~~2~~, B.2~~</u> ⑤

Condition B applies to the failure of ~~two FBACS actuation logic trains,~~ one reqired ~~two~~ radiation monitor~~s,~~ or two manual channels. The Required Action is to place one ~~FBACS~~ ABGTS 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~~ 12 must also be entered for the ~~FBACS~~ ABGTS 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~~ 12. ⑤ ① ③ ① ③

~~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.~~ ⑤

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~~]~~ ② irradiated fuel assemblies are being moved in the ~~fuel~~ auxiliary building. Movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building must ④ ② be suspended immediately to eliminate the potential for events that could require ~~FBACS~~ ABGTS actuation. ①

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.

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~~ ABGTS Actuation Functions. ⑥ ①

SR 3.3.8.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 hours 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.~~ ⑦

~~OR~~

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

~~-------------------------------REVIEWER'S NOTE-------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑧

SR 3.3.8.2

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. This test verifies the capability of the instrumentation to provide the ~~FBACS~~ ABGTS actuation. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ①

~~[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.~~ ⑦

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~---------------------------------REVIEWER'S NOTE----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

~~SR 3.3.8.3~~

~~[SR 3.3.8.3 is the performance of an ACTUATION LOGIC TEST. All possible logic combinations, with and without applicable permissives, are tested for each protection function. [The actuation logic is tested every 31 days on a STAGGERED TEST BASIS. 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.~~

~~OR~~

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

~~---------------------------------REVIEWER'S NOTE----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]]~~ ⑤

SR 3.3.8.~~4~~ 3 ⑤

SR 3.3.8.~~4~~ 3 is the performance of a TADOT. This test is a check of the manual actuation functions. 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 ⑤

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑦

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~ ⑧
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

The 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~~4 ⑤

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of [18] months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑦

~~OR~~

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

①

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

⑧

REFERENCES

1. 10 CFR 100.11.

2. 10 CFR 50.67

3 ~~2~~. ~~Unit Specific Setpoint Calibration~~ TI-18, Radiation Monitoring Procedure.

④

④ ①

B 3.3 INSTRUMENTATION

B 3.3.8A ~~Fuel Building~~ Auxiliary Building Gas Treatment ~~Air Cleanup~~ System (~~FBACS~~ ABGTS) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The ~~FBACS~~ ABGTS ensures that radioactive materials in the ~~fuel~~ auxiliary 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~~ 12, "~~Fuel Building~~ Auxiliary Building Gas Treatment ~~Air Cleanup~~ System (ABGTS)." The system initiates filtered ventilation of INSERT 1 ~~the fuel building~~ automatically following receipt of a spent fuel pool area high radiation signal ~~(gaseous or particulate)~~ or a ~~safety injection (SI)~~ Containment Phase A Isolation signal. Initiation may also be performed manually as needed from the main control room. ① ② ③ ④

High ~~gaseous and particulate~~ area radiation, ~~each~~ monitored by either of two monitors, provides ~~FBACS~~ ABGTS initiation. Each ~~FBACS~~ ABGTS 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~~ the required monitor or ~~an SI~~ Containment Phase A Isolation signal from the Engineered Safety Features Actuation System (ESFAS) initiates ~~fuel~~ auxiliary building isolation and starts the ~~FBACS~~ ABGTS. These actions function to prevent exfiltration of contaminated air by initiating filtered ventilation, which imposes a negative pressure on the ~~fuel building~~ Auxiliary Building Secondary Containment Enclosure (ABSCE). ~~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.~~ ④ ① ④ ① ④

APPLICABLE SAFETY ANALYSES

The ~~FBACS~~ ABGTS ensures that radioactive materials in the ~~fuel building~~ ABSCE 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~~ auxiliary building exhaust following a LOCA or fuel handling accident so that offsite doses remain within the limits specified in 10 CFR 100 (Ref. 1) for LOCA or 10 CFR 50.67 (Ref. 2) for fuel handling accident. ① ④ ② ④ ④

The ~~FBACS~~ ABGTS actuation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). ①

LCO

The LCO requirements ensure that instrumentation necessary to initiate the ~~FBACS~~ ABGTS is OPERABLE. ①

④ INSERT 1

exhaust air from the fuel handling area, ECCS pump rooms, and waste packaging area

BASES

LCO (continued)

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the ~~FBACS~~ ABGTS at any time by using ~~either of two switches in the control room~~ INSERT 2. This action will cause actuation of all components in the same manner as any of the automatic actuation signals. ① 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~~ hand switch and the interconnecting wiring to the actuation logic cabinet. ④

~~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.~~ ⑤

~~3~~ 2. Spent Fuel ~~Building~~ Pool Area Radiation ⑤ ④

The LCO specifies ~~two required Gaseous~~ one Spent Fuel Pool Area Radiation Monitor channel~~s and two required Particulate Radiation Monitor channels~~ to ensure that the radiation monitoring instrumentation necessary to initiate the ~~FBACS~~ ABGTS remains OPERABLE. INSERT 3 ④ ① ④

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. INSERT 4 ⑤

④ INSERT 2

one of two sets of manual initiation hand switches in the control room. Each Auxiliary Building Isolation (ABI) manual hand switch will initiate its respective train of ABGTS.

④ INSERT 3

One radiation monitor is dedicated to each train of ABGTS.

⑤ INSERT 4

The measurement range for the Spent Fuel Pool Area Monitors is 10^{-1} to 10^{4} mR/hr.

The Required Channels value is modified by a footnote stating that the Required Channel shall be associated with the ABGTS train required OPERABLE per LCO 3.7.12. This ensures a valid actuation signal will start a train of ABGTS.

3. Containment Isolation - Phase A

Refer to LCO 3.3.2, Function 3.a., for all initiating Functions and requirements.

BASES

LCO (continued)

Only the Trip Setpoint is specified for each ~~FBACS~~ ABGTS Function in the LCO. The Trip Setpoint limits account for instrument uncertainties, which are defined in ~~the Unit Specific Setpoint Calibration~~ TI-18, Radiation Monitoring Procedure (Ref. ~~2~~ 3). ① ④

APPLICABILITY

The manual ~~FBACS~~ ABGTS initiation must be OPERABLE in MODES ~~[~~1, 2, 3, and 4~~]~~ and when moving ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building, to ensure the ~~FBACS~~ ABGTS operates to remove fission products associated with leakage after a LOCA or a fuel handling accident ~~[~~involving handling recently irradiated fuel~~]~~. The automatic ~~FBACS~~ ABGTS 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. ① ② ④ ① ① ② ④

High radiation initiation of the ~~FBACS~~ ABGTS must be OPERABLE in any MODE during movement of ~~[~~recently~~]~~ irradiated fuel assemblies in the ~~fuel~~ auxiliary building to ensure automatic initiation of the ~~FBACS~~ ABGTS when the potential for the limiting fuel handling accident exists. ~~[~~Due to radioactive decay, the ~~FBACS~~ ABGTS 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~~ 100 hours).~~]~~ ① ② ④ ① ② ① ②

While in MODES 5 and 6 without fuel handling ~~[~~involving handling recently irradiated fuel~~]~~ in progress, the ~~FBACS~~ ABGTS instrumentation need not be OPERABLE since a fuel handling accident ~~[~~involving handling recently irradiated fuel~~]~~ cannot occur. ① ②

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. ④

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since recently 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 recently irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving recently 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. ⑤ ⑤

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~~ channel cannot be restored to OPERABLE status, one ~~FBACS~~ ABGTS 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~~12. ⑤ ① ③

B.~~1.~~1~~,~~ and B.~~1.~~2~~, B.2~~ ⑤

Condition B applies to the failure of ~~two FBACS actuation logic trains,~~ one reqired ~~two~~ radiation monitor~~s,~~ or two manual channels. The Required Action is to place one ~~FBACS~~ ABGTS 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~~12 must also be entered for the ~~FBACS~~ ABGTS 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~~12. ⑤ ① ③ ① ③

~~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.~~ ⑤

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~~]~~ ② irradiated fuel assemblies are being moved in the ~~fuel~~ auxiliary building. ④ Movement of ~~[~~recently~~]~~ ② irradiated fuel assemblies in the ~~fuel~~ auxiliary building must be suspended immediately to eliminate the potential for events that could require ~~FBACS~~ ABGTS actuation. ①

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.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that table 3.3.8-1 ⑥ determines which SRs apply to which ~~FBACS~~ ABGTS Actuation Functions. ①

SR 3.3.8.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the 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 of 12 hours 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.~~ ⑦

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑧
~~---]~~

SR 3.3.8.2

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. This test verifies the capability of the instrumentation to provide the ~~FBACS~~ ABGTS actuation. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology. ①

~~[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.~~ ⑦

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

~~SR 3.3.8.3~~

~~[SR 3.3.8.3 is the performance of an ACTUATION LOGIC TEST. All possible logic combinations, with and without applicable permissives, are tested for each protection function. [The actuation logic is tested every 31 days on a STAGGERED TEST BASIS. 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.~~

~~OR~~

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

~~----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]]~~ ⑤

SR 3.3.8.~~4~~ 3 ⑤

SR 3.3.8.~~4~~ 3 is the performance of a TADOT. This test is a check of the manual actuation functions. 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 ⑤

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 of 18 months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑦

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~ ⑧
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

The 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~~ 4 ⑤

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. There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

~~[The Frequency of [18] months is based on operating experience and is consistent with the typical industry refueling cycle.~~ ⑦

~~OR~~

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

8

REFERENCES

1. 10 CFR 100.11.

2. 10 CFR 50.67

3

~~2~~. ~~Unit Specific Setpoint Calibration~~ TI-18, Radiation Monitoring Procedure.

4

4 1

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.8 BASES, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS B 3.3.8B (with Setpoint Control Program Specification) is not used and is not shown. Furthermore, the title of the Specification has been changed from "Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation" to "Auxiliary Building Gas Treatment System (ABGTS) Actuation Instrumentation" since Sequoyah Nuclear Plant (SQN) does not have an FBACS.

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

3. Changes are made to be consistent with changes made to ISTS LCO 3.7.13. The Title and the number for this specification were changed and are reflected in the Bases of ITS B 3.3.8.

4. 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.

5. Changes are made to be consistent with changes made to the Specification.

6. Typographical/grammatical error corrected.

7. ISTS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.4, and SR 3.3.8.5 (ITS SR 3.3.8.1, SR 3.3.8.2, SR 3.3.8.3, and SR 3.3.8.4) Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.8, AUXILIARY BUILDING GAS TREATMENT SYSTEM (ABGTS) ACTUATION INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 9

ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION (BDMI)

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

3/4.3 INSTRUMENTATION

BORON DILUTION MONITORING A02

3/4.3.1 ~~REACTOR TRIP SYSTEM~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

boron dilution monitoring A02

LCO 3.3.9 3.3.1.1 As a minimum, the ~~reactor trip system~~ instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

See ITS 3.3.1

Applicability APPLICABILITY: As shown in Table 3.3-1.

Add proposed Applicability Note L01

ACTION:

ACTION B As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

boron dilution monitoring A02

See ITS 3.3.1

SR 3.3.9.1, SR 3.3.9.2, SR 3.3.9.3 4.3.1.1.1 Each ~~reactor trip system~~ instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-1.

CHANNEL OPERATIONAL TEST (COT) M01

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

See ITS 3.3.1

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.

See ITS 3.3.1

A01

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION	
							LA01
	1. Manual Reactor Trip	2	1	2	1, 2, and *	1	
	2. Power Range, Neutron Flux	4	2	3	1, 2	2	
	3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2	See ITS 3.3.1
	4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2	
	5. Intermediate Range, Neutron Flux	2	1	2	1, 2, and *	3, 17	
	6. Source Range, Neutron Flux						
	A. Startup	2	1	2	$2^{\#\#}$, and *	4	See ITS 3.3.1
LCO 3.3.9, Applicability, ACTION A	B. Shutdown	~~2~~	~~0~~	1	3, 4 and 5	5	LA01
	7. Overtemperature ΔT Four Loop Operation	4	2	3	1, 2	6	
	8. Overpower ΔT Four Loop Operation	4	2	3	1, 2	6	
	9. Pressurizer Pressure-Low	4	2	3	1, 2	6	See ITS 3.3.1
	10. Pressurizer Pressure—High	4	2	3	1, 2	6	
	11. Pressurizer Water Level—High	3	2	2	1, 2	6	

A01

TABLE 3.3-1 (Continued)

See ITS 3.3.1

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.

d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

ACTION A

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with ~~the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable~~, within 1 hour and at least once per 12 hours thereafter.

Add proposed Required Actions A.1, A.2.1, and A.2.2.1

SR 3.1.1.1

A03

M02

See ITS 3.3.1

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours.

A01

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01

COT

	FUNCTIONAL UNIT	CHANNEL CHECK SR 3.3.9.1	CHANNEL CALIBRATION SR 3.3.9.3	~~CHANNEL FUNCTIONAL TEST~~ SR 3.3.9.2	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1.	Manual Reactor Trip	N.A.	N.A.	S/U(1)and R(9)	1, 2, and *
2.	Power Range, Neutron Flux	S	D(2), (3) and Q(6)	Q	1, 2
3.	Power Range, Neutron Flux, High Positive Rate	N.A.	R(6)	Q	1, 2
4.	Power Range, Neutron Flux, High Negative Rate	N.A.	R(6)	Q	1, 2
5.	Intermediate Range, Neutron Flux	S	R(6)	S/U(1)	1, 2, and *
SR 3.3.9.1, SR 3.3.9.2, SR 3.3.9.3 6.	Source Range, Neutron Flux	~~S~~(7)	~~R~~(6)	~~M and S/U(1)~~	2, 3, 4, 5, and *
7.	Overtemperature Delta T	S	R	Q	1, 2
8.	Overpower Delta T	S	R	Q	1, 2
9.	Pressurizer Pressure--Low	S	R	Q	1, 2
10.	Pressurizer Pressure--High	S	R	Q	1, 2
11.	Pressurizer Water Level—High	S	R	Q	1, 2
12.	Loss of Flow - Single Loop	S	R	Q	1
13.	Loss of Flow - Two Loops	S	R	N.A.	1
14.	Steam Generator Water Level--Low-Low				
	A. Steam Generator Water Level--Low-Low (Adverse)	S	R	Q	1, 2
	B. Steam Generator Water Level--Low-Low (EAM)	S	R	Q	1, 2
	C. RCS Loop ΔT	S	R	Q	1, 2
	D. Containment Pressure (EAM)	S	R	Q	1, 2

See ITS 3.3.1

See ITS 3.3.1

L02

L03

~~184 days~~

In accordance with the Surveillance Frequency Control Program

LA02

See ITS 3.3.1

May 30, 1995

A01

TABLE 4.3-1 (Continued)

NOTATION

* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

** - Above the P-9 (Power Range Neutron Flux) interlock.

See ITS 3.3.1

~~(1) - If not performed in previous 31 days.~~

L02

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is $\geq$ 15% RTP.

(4) - Deleted.

(5) - Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.

See ITS 3.3.1

SR 3.3.9.3 Note

(6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

(9) - The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.

(10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(11) - Automatic and manual undervoltage trip.

(12) - Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.

See ITS 3.3.1

Add proposed SR 3.3.9.2 Note

L04

3/4.3 INSTRUMENTATION

BORON DILUTION MONITORING

A02

3/4.3.1 ~~REACTOR TRIP SYSTEM~~ INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

boron dilution monitoring

A02

LCO 3.3.9 3.3.1 As a minimum, the ~~reactor trip system~~ instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

See ITS 3.3.1

Applicability APPLICABILITY: As shown in Table 3.3-1.

Add proposed Applicability Note

L01

ACTION:

ACTION B As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

boron dilution monitoring

A02

See ITS 3.3.1

SR 3.3.9.1, SR 3.3.9.2, SR 3.3.9.3 4.3.1.1.1 Each ~~reactor trip system~~ instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ operations for the MODES and at the frequencies shown in Table 4.3-1.

CHANNEL OPERATIONAL TEST (COT)

M01

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

See ITS 3.3.1

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.

See ITS 3.3.1

ITS

A01

ITS 3.3.9

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

LA01

FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2, and *	1
2. Power Range, Neutron Flux	4	2	3	1, 2	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2
4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2
5. Intermediate Range, Neutron Flux	2	1	2	1, 2, and *	3, 17
6. Source Range, Neutron Flux					
A. Startup	2	1	2	$2^{\#\#}$, and *	4
B. Shutdown	~~2~~	~~0~~	1	3, 4 and 5	5
7. Overtemperature ΔT Four Loop Operation	4	2	3	1, 2	6
8. Overpower ΔT Four Loop Operation	4	2	3	1, 2	6
9. Pressurizer Pressure-Low	4	2	3	1, 2	6
10. Pressurizer Pressure—High	4	2	3	1, 2	6
11. Pressurizer Water Level—High	3	2	2	1, 2	6

See ITS 3.3.1

See ITS 3.3.1

LCO 3.3.9, Applicability, ACTION A

LA01

See ITS 3.3.1

A01

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.

d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

See ITS 3.3.1

ACTION A

ACTION 5 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, verify compliance with ~~the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable~~, within 1 hour and at least once per 12 hours thereafter.

Add proposed Required Actions A.1, A.2.1, and A.2.2.1

M02

SR 3.1.1.1

A03

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours.

See ITS 3.3.1

.

A01

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01

	FUNCTIONAL UNIT	CHANNEL CHECK SR 3.3.9.1	CHANNEL CALIBRATION SR 3.3.9.3	~~CHANNEL FUNCTIONAL TEST~~ COT SR 3.3.9.2	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1.	Manual Reactor Trip	N.A.	N.A.	S/U(1)and R(9)	1, 2, and *
2.	Power Range, Neutron Flux	S	D(2), (3) and Q(6)	Q	1, 2
3.	Power Range, Neutron Flux, High Positive Rate	N.A	R(6)	Q	1, 2
4.	Power Range, Neutron Flux, High Negative Rate	N.A	R(6)	Q	1, 2
5.	Intermediate Range, Neutron Flux	S	R(6)	S/U(1)	1, 2, and *
SR 3.3.9.1, SR 3.3.9.2 SR 3.3.9.3 6.	Source Range, Neutron Flux	~~S~~(7)	~~R~~(6)	~~M and S/U(1)~~	2, 3, 4, 5, and *
7.	Overtemperature ΔT	S	R	Q	1, 2
8.	Overpower ΔT	S	R	Q	1, 2
9.	Pressurizer Pressure--Low	S	R	Q	1, 2
10.	Pressurizer Pressure--High	S	R	Q	1, 2
11.	Pressurizer Water Level—High	S	R	Q	1, 2
12.	Loss of Flow - Single Loop	S	R	Q	1
13.	Loss of Flow - Two Loops	S	R	N.A.	1
14.	Steam Generator Water Level--Low-Low				
	A. Steam Generator Water Level--Low-Low (Adverse)	S	R	Q	1, 2
	B. Steam Generator Water Level--Low-Low (EAM)	S	R	Q	1, 2
	C. RCS Loop ΔT	S	R	Q	1, 2
	D. Containment Pressure (EAM)	S	R	Q	1, 2

See ITS 3.3.1

See ITS 3.3.1

L02

L03

~~184 days~~

In accordance with the Surveillance Frequency Control Program

LA02

See ITS 3.3.1

A01

Table 4.3-1 (Continued)

NOTATION

* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

** - Above the P-9 (Power Range Neutron Flux) interlock.

See ITS 3.3.1

~~(1) - If not performed in previous 31 days.~~

L02

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is ≥ 15% RTP.

(4) - Deleted.

(5) - Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.

See ITS 3.3.1

SR 3.3.9.3 Note

(6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

(9) - The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.

(10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(11) - Automatic and manual undervoltage trip.

(12) - Prior to exceeding the P-9 interlock whenever the unit has been in HOT STANDBY.

See ITS 3.3.1

Add proposed SR 3.3.9.2 Note

L04

DISCUSSION OF CHANGES
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) 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. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS LCOs 3.3.1.1 (Unit 1) and 3.3.1 (Unit 2), requires the Reactor Trip System Instrumentation channels and interlocks shown in Table 3.3-1 to be OPERABLE and requires that each channel be demonstrated OPERABLE by performance of the tests specified in CTS Table 4.3-1, including Functional Unit 6.B (Source Range, Neutron Flux, Shutdown). ITS 3.3.9, "Boron Dilution Monitoring Instrumentation (BDMI)," provides similar OPERABILITY and testing requirements for the source range neutron flux monitoring channels. This changes the CTS by providing a separate Specification for the Source Range, Neutron Flux, Shutdown Function (Boron Dilution Monitoring Instrumentation), in lieu of including it with the Reactor Trip System Instrumentation Specification.

This change is acceptable because the technical requirements for the Source Range, Neutron Flux, Shutdown Instrumentation are maintained with the change in format. The Boron Dilution Monitoring Instrumentation Specification continues to require the OPERABILITY and testing of the source range neutron flux monitoring instrumentation. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS Table 3.3-1 ACTION 5, which is the ACTION referenced in Table 3.3-1 for Functional Unit 6.B (Source Range, Neutron Flux – Shutdown), requires within one hour and every twelve hours thereafter, that when both channels are inoperable in MODES 3, 4, and 5 to verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable. ITS 3.3.9 Required Action A.2.2.2 requires, in part, that when the required source range neutron flux monitoring channel is inoperable, to perform SR 3.1.1.1. This changes the CTS by changing the presentation of how to perform the verification of compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2.

This change is acceptable because the requirement have not changed. In CTS, the SHUTDOWN MARGIN specification was in two separate Specifications. CTS 3.1.1.1 contained the requirements for the SHUTDOWN MARGIN when T_{avg} was greater than or equal to 200 degrees Fahrenheit. CTS 3.1.1.2 contained the requirements for the SHUTDOWN MARGIN when T_{avg} was less than or equal to 200 degrees Fahrenheit. The ITS combined these two CTS Specifications into ITS 3.1.1, "SHUTDOWN MARGIN." Therefore, stating in ITS 3.3.9 Required Action A.2.2.2, to perform SR 3.1.1.1 is the same as the CTS Table 3.3-1 ACTION 5 statement to verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable. This change is considered a change in presentation and, therefore, is considered as an administrative change since it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.3.1.1.1 requires, in part, the reactor trip system instrumentation shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST for the MODES and Frequencies shown in Table 4.3-1. Table 4.3-1 Functional Unit 6 requires a CHANNEL FUNCTIONAL TEST of the Source Range Neutron Flux. ITS SR 3.3.9.1 requires performance of a CHANNEL OPERABILITY TEST (COT) for each source range neutron flux monitoring channel. This changes the CTS by requiring a COT instead of a CHANNEL FUNCTIONAL TEST.

This change is acceptable because the COT continues to perform a test similar to the current CHANNEL FUNCTIONAL TEST. CTS defines a CHANNEL FUNCTIONAL TEST based on the type of channel. In CTS a CHANNEL FUNCTIONAL TEST shall be: for Analog channels, the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY including alarm and/or trip functions; for Bistable channels, the injection of a simulated signal into the sensor to verify OPERABILITY including alarm and/or trip functions; and for digital channels, the injection of a simulated signal into the channel as close to the sensor input to the process racks as practicable to verify OPERABILITY including alarm and/or trip functions. The CHANNEL OPERATIONAL TEST (COT) provides a similar test with the addition that the COT includes adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires additional acceptance criteria that is not required in the CTS.

M02 CTS Table 3.3-1 ACTION 5, which is the ACTION referenced in Table 3.3-1 for Functional Unit 6.B (Source Range, Neutron Flux – Shutdown), requires when both channels are inoperable in MODES 3, 4, and 5 to verify compliance with the SHUTDOWN MARGIN requirements within one hour and every 12 hours thereafter. ITS 3.3.9 ACTION A requires that when the required source range neutron flux monitoring channel is inoperable, to suspend operations involving positive reactivity additions immediately except when plant temperature changes are accounted for in the calculated SDM (Required Action A.1). ITS 3.3.9 ACTION A also requires either the restoration of the required source range neutron flux monitoring channel to OPERABLE status within one hour OR to initiate action to close one combination of unborated water source isolation valves and perform SR 3.1.1.1 within one hour (Required Actions A.2.1, A.2.2.1 and A.2.2.2, respectively). This changes the CTS by adding Required Actions (Required Actions A.1 and A.2.2.1) when the required channel is inoperable.

The purpose of Table 3.3-1 ACTION 5 is to verify that SHUTDOWN MARGIN is still within the required limits when the required source range channel is not available to monitor for changes in core reactivity. This change is acceptable because the added 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. Furthermore, the Required Actions are consistent with safe operation under the specified Conditions. This change is considered more restrictive because additional Required Actions are required in the ITS that were 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 3.3-1, "Reactor Trip System Instrumentation," includes three columns stating various requirements for the Source Range Neutron Flux Shutdown Function. These columns are labeled "TOTAL NO. OF CHANNELS," "CHANNELS TO TRIP," and "MINIMUM CHANNELS OPERABLE." For CTS Table 3.3.1 Functional Unit 6.B, the "CHANNELS TO TRIP COLUMN" is "0" (i.e., the Function is required to provide an indication only function and is not required to have a trip function). ITS 3.3.9 does not include the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns. This changes the CTS by moving the information of the "TOTAL NO. OF CHANNELS" and "CHANNELS TO TRIP" columns to the Bases.

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

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.3.1.1.1 requires that each reactor trip system instrumentation channel be demonstrated OPERABLE by performance of a CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST for the MODES and Frequencies shown in Table 4.3-1. CTS Table 4.3-1 Functional Unit 6 requires performance of a CHANNEL CHECK every 12 hours, a CHANNEL CALIBRATION every refueling outage, and a CHANNEL FUNCTIONAL TEST every month for the source range neutron flux monitors during MODES 3, 4, and 5. ITS SR 3.3.9.1, SR 3.3.9.2, and SR 3.3.9.3 require similar Surveillances and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." (See DOC M01 for the discussion on changing the

DISCUSSION OF CHANGES
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION

CHANNEL FUNCTIONAL TEST to a COT. Also, see DOC L01 for discussion on changing the COT Surveillance Frequency from monthly to 184 days.) This changes the CTS by moving the specified Frequencies for the SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies 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 existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS 3.3.1.1 [3.3.1 Unit 2] Applicability states that the Applicability of each Functional Unit is as shown in Table 3.3-1. For CTS Table 3.3-1 Functional Unit 6.B (Source Range, Neutron Flux, Shutdown) the "Applicable MODES" column lists MODES 3, 4, and 5. ITS 3.3.9, Boron Dilution Monitoring Instrumentation, provides requirements for the Source Range Neutron Flux instruments. ITS 3.3.9 Applicability similarly lists MODES 3, 4, and 5 but is modified by a Note that states, "The high flux at shutdown alarm may be blocked in MODE 3 during reactor startup." This changes the CTS Mode of Applicability for the high flux at shutdown alarm by allowing blocking of the alarm in MODE 3 during reactor startup.

The purpose of CTS Table 3.3-1 Functional Unit 6.B (Source Range, Neutron Flux, Shutdown) is to provide indication of a dilution accident in sufficient time for the operators to respond and mitigate the accident. This change is acceptable because the requirements continue to ensure that the operators would be made aware of a dilution accident in sufficient time to respond and mitigate the accident. A reactor startup is a controlled activity where operator's attention is focused on the reactivity condition of the reactor core. Boron concentration is also monitored as one of the inputs to the estimated critical position calculation. In addition, the source range and intermediate range nuclear instruments are monitored closely specifically looking for indications of an unplanned reactivity rate of change. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

DISCUSSION OF CHANGES
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION

L02 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table 4.3-1 Functional Unit 6 requires a CHANNEL FUNCTIONAL TEST of the Source Range Neutron Flux at startup if not performed within the previous 31 days. The ITS does not require the "during startup if not performed within the previous 31 days" test. This changes the CTS by deleting the requirement to perform the startup Surveillance on the Source Range Neutron Flux.

The purpose of a CHANNEL FUNCTIONAL TEST is to ensure the instrumentation is functioning properly. This change is acceptable because the normal periodic CHANNEL FUNCTIONAL TEST (See DOC M01 for discussion on changing the channel FUNCTIONAL TEST to a COT) Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. This change deletes the requirement to perform the startup Surveillance on the Source Range Neutron Flux channels. ITS SR 3.0.4 requires the periodic Surveillances to be performed and be current prior to entry into the applicability. Once the applicable conditions are entered, the normal, periodic Surveillance Frequency provides adequate assurance of OPERABILITY. Therefore, the removal of this Frequency is considered acceptable. This change is designated as less restrictive because Surveillances will be performed less frequently under ITS than under the CTS.

L03 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 4.3-1 requires a CHANNEL FUNCTIONAL TEST on a monthly bases (M) for Functional Unit 6 (Source Range Neutron Flux). ITS SR 3.3.9.2 requires performance of a COT every 184 days. (See DOC LA02 for discussion on relocating the Surveillance Frequency to the Surveillance Frequency Control Program.) This changes the CTS by changing the frequency of the Surveillances from monthly to 184 days.

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). TVA 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 Enclosure 4 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.

L04 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1, in part, requires a FUNCTIONAL TEST for Functional Unit 6.B (Source Range, Neutron Flux, Shutdown) in MODES 2, 3, 4, 5, and with the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. When in the required MODES, the FUNCTIONAL TEST is required to be performed on a monthly basis (M) and prior to startup (S/U) if not performed in the previous 31 days (Note (1)). ITS SR 3.3.9.2 requires a CHANNEL OPERATIONAL TEST

(COT) for the required Boron Dilution Monitoring Instrumentation (Source Range Neutron Flux Monitoring Channel) in MODE 3, 4, and 5. ITS SR 3.3.9.2 is modified by a note stating, "Not required to be performed prior to entering MODE 3 from MODE 2 until 24 hours after entry into MODE 3." This changes the CTS by allowing for a delay in performance of the surveillance.

The purpose of the CTS FUNCTIONAL TEST for the Source Range Neutron Flux Function is to ensure the channel will perform the intended Function. This change is acceptable because the delay in surveillance performance is similar to that allowed under SR 3.0.3 when it is determined a surveillance has been missed. The function of the Source Range Neutron flux monitoring channel is to provide the operators indication of a dilution accident with sufficient time for operator action to mitigate the accident (i.e., greater than 15 minutes). The addition of the Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 and prevents entry into Required Actions, which are probably unnecessary, should an unplanned reactor trip occur. ITS SR 3.3.9.3 requires a channel calibration of these instrument every 18 months. ITS SR 3.3.9.2 requires a COT performed on the required channel every 184 days when in MODES 3, 4, or 5. ITS SR 3.3.9.1 requires a CHANNEL CHECK be performed every 12 hours while in MODES 3, 4, or 5. Before exiting MODE 6 and entering MODE 5 the required channel's testing must be current and maintained current until MODE 3 is exited and MODE 2 entered. Once in MODE 2 and then MODE 1, the instruments are no longer in their MODE of Applicability and in accordance with ITS SR 3.0.1 the surveillance requirements are not required to be meet. Entry into MODE 3 from MODE 2 without performance of SR 3.3.9.2 is similar to discovery of a Surveillance not being performed within its specified Frequency. Similarly, ITS SR 3.3.1.7 Note and ITS SR 3.0.3, under the condition of a missed surveillance, allows 24 hours to perform surveillance requirements. In addition, the operators will be monitoring the source range nuclear instruments during the plant shutdown performing a qualitative assessment of the channel's behavior where any unusual behavior will be identified and evaluated. This change is designated as less restrictive because a Surveillance will be performed less frequently under the ITS than under the CTS.

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

3.3 INSTRUMENTATION

3.3.9~~A~~ Boron Dilution ~~Protection System~~ Monitoring Instrumentation (BD~~PS~~ MI) ~~(Without Setpoint Control Program)~~ ①

3.3.1.1, Table 3.3-1 Function 6.B — LCO 3.3.9~~A~~ ~~Two trains of the BDPS~~ One source range neutron flux monitoring channel shall be OPERABLE. ②

Applicability, Table 3.3-1 Function 6.B — APPLICABILITY: MODES ~~[2,]~~ 3, 4, and 5. ③

DOC L01

---NOTE---

The ~~boron dilution flux doubling signal~~ high flux at shutdown alarm may be blocked in MODE~~S 2 and~~ 3 during reactor startup. ④

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A.~~ ~~One train inoperable~~.	~~A.1~~ ~~Restore train to OPERABLE status.~~	~~72 hours~~ ②
~~B~~A. ~~Two trains~~ One required channel inoperable. ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	~~B~~A.1 --------------NOTE-------------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. ② ------------------------------------- Suspend operations involving positive reactivity additions.	 Immediately
	AND	
	~~B~~A.2.1 Restore ~~one train~~ required channel to OPERABLE status. ②	1 hour
	OR	

Table 3.3-1 ACTION 5 DOC M02

DOC M02

DOC M02

CTS

BD~~PS (Without Setpoint Control Program)~~ MI
3.3.9~~A~~ ①

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC M02		~~B~~ A .2.2.1 Initiate action to ~~C~~lose one combination of unborated water source isolation valves. AND	~~1 hour~~ Immediately	② ④
Table 3.3-1 ACTION 5		~~B~~ A .2.2.2 Perform SR 3.1.1.1.	1 hour AND Once per 12 hours thereafter	②

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
Table 4.3-1 Function 6	SR 3.3.9.1 Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥
Table 4.3-1 Function 6, DOC M01, DOC L01 DOC L04	SR 3.3.9.2 -----NOTE----- Not required to be performed prior to entering MODE 3 from MODE 2 until 24 hours after entry into MODE 3 ----- Perform COT.	~~[[184] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑦ ⑥ ⑥

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
Table 4.3-1 Function 6 and Note (6)	SR 3.3.9.3 -------------------------------NOTE------------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	⑥ ⑥

3.3 INSTRUMENTATION

3.3.9~~A~~ Boron Dilution Monitoring Instrumentation ~~Protection System~~ (BD MI ~~PS~~) ~~(Without Setpoint Control Program)~~ ①

3.3.1.1, Table 3.3-1 Function 6.B

LCO 3.3.9~~A~~ One source range neutron flux monitoring channel ~~Two trains of the BDPS~~ shall be OPERABLE. ②

Applicability, Table 3.3-1 Function 6.B

APPLICABILITY: MODES ~~[2,]~~ 3, 4, and 5. ③

DOC L01

--NOTE--
The high flux at shutdown alarm ~~boron dilution flux doubling signal~~ may be blocked in MODE~~S 2 and~~ 3 during reactor startup. ④

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
	~~A. One train inoperable.~~	~~A.1 Restore train to OPERABLE status.~~	~~72 hours~~	②
Table 3.3-1 ACTION 5 DOC M02	A ~~B~~. One required channel ~~Two trains~~ inoperable. ~~OR~~ ~~Required Action and associated Completion Time of Condition A not met.~~	A ~~B~~.1 --------------NOTE-------------- Plant temperature changes are allowed provided the temperature change is accounted for in the calculated SDM. -------------------------------------		②
DOC M02		Suspend operations involving positive reactivity additions.	Immediately	
		AND		
DOC M02		A ~~B~~.2.1 Restore required channel ~~one train~~ to OPERABLE status.	1 hour	②
		OR		

CTS

BD MI ~~PS (Without Setpoint Control Program)~~ ①
3.3.9A

ACTIONS (continued)

DOC M02 ② ④

Table 3.3-1 ACTION 5 ②

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~B~~ A.2.2.1 Initiate action to Close one combination of unborated water source isolation valves. AND ~~B~~ A.2.2.2 Perform SR 3.1.1.1.	Immediately ~~1 hour~~ 1 hour AND Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

Table 4.3-1 Function 6

Table 4.3-1 Function 6, DOC M01, DOC L01

DOC L04

SURVEILLANCE	FREQUENCY
SR 3.3.9.1 Perform CHANNEL CHECK.	~~[12 hours~~ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥
SR 3.3.9.2 Perform COT. -----NOTE----- Not required to be performed prior to entering MODE 3 from MODE 2 until 24 hours after entry into MODE 3 -----	~~[[184] days~~ ⑦ ⑥ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ ⑥

SURVEILLANCE REQUIREMENTS (continued)

Table 4.3-1 Function 6 and Note (6)

SURVEILLANCE		FREQUENCY
SR 3.3.9.3	------------------------------NOTE----------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

⑥ ⑥

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION (BDMI)

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS 3.3.9B (with Setpoint Control Program Specification) is not used and is not shown. Additionally, the title of the Specification has been changed from "Boron Dilution Protection System (BDPS)" to "Boron Dilution Monitoring Instrumentation (BDMI)" since an actual "Protection System" does not exist at SQN.

2. ISTS 3.3.9A is not applicable to the SQN design or licensing bases. The BDPS as described in the ISTS is a two train system that provides automatic protection against boron dilution accidents by switching the charging pump suction to the RWST upon a specified high flux signal. Such a system is not part of the SQN plant design. The SQN units rely on detection of the event and operator action to mitigate the accident in MODES 3, 4, and 5.

   CTS 3.3.1.1, Reactor Trip System Instrumentation requires a single channel of source range instrumentation OPERABLE in MODES 3, 4, and 5. This requirement provides the only TS required means to monitor core reactivity under the specified plant condition. The requirement includes MODE 3 where the monitoring function serves as the only "required" means to detect a boron dilution event in progress. Although the source range channel does not actuate a system designed to mitigate a boron dilution event, it does provide the only TS required means of directly indicating neutron flux in the specified MODES. Therefore, the CTS Table 3.3-4 Functional Unit 6.B requirement for a single OPERABLE source range indication channel in MODES 3, 4, and 5 is being retained in ITS 3.3.9. The proposed LCO and ACTIONS have been changed to reflect the current requirement of one source range monitoring instrument channel to identify a possible boron dilution event.

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

4. ISTS 3.3.9A contains an Applicability Note which states that the boron dilution flux doubling signal may be blocked in MODES 2 and 3 during reactor startup. ITS 3.3.9 Applicability does not include MODE 2 and SQN does not have a boron dilution flux doubling signal but a High Flux at Shutdown alarm. Therefore, this information was changed to reflect the SQN design.

5. 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.

6. ISTS SR 3.3.9.1, SR 3.3.9.2 and SR 3.3.9.3 (ITS SR 3.3.9.1, SR 3.3.9.2 and SR 3.3.9.3) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program.

7. A Note has been added to ISTS SR 3.3.9.2 similar to the Note included in ITS 3.3.1.7 to delay performance of the surveillance when entering MODE 3 from

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION (BDMI)

MODE 2 allowing time for performed without entering the Required Actions for an inoperable required channel.

8. CTS Table 3.3.1 ACTION 5 is associated with Functional Unit 6.B (Source Range, Neutron Flux – Shutdown) and requires that with the number of Source Range channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter. TVA proposes to add a requirement, under this condition, to initiate action to one combination of unborated water source isolation valves immediately. This changes the ISTS requirements on closing the unborated water source isolation valve within one hour to initiating action to close one combination of unborated water source isolation valves immediately. This change from ISTS is justified because the CTS requirements are being retained and completion of the closure of the required isolation valves is being performed in a reasonable time. Requiring one hour for isolation of numerous isolation valves during a plant shutdown with shutdown margin confirmed and monitored is considered unnecessary.

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

B 3.3 INSTRUMENTATION

B 3.3.9~~A~~ Boron Dilution ~~Protection System~~ Monitoring Instrumentation (BD~~PS~~ MI) ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The primary purpose of the BD~~PS~~ MI is to INSERT 1 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)~~. ① ② ②

INSERT 2 ~~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.~~ ②

~~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.~~

APPLICABLE SAFETY ANALYSES

The BD~~PS~~ MI 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)~~. INSERT 3 ~~The accident analyses rely on automatic BDPS actuation to mitigate the consequences of inadvertent boron dilution events.~~ ① ②

The BD~~PS~~ MI satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

LCO 3.3.9 provides the requirements for OPERABILITY ~~of the~~ INSERT 4 ~~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. ②

~~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.~~

② INSERT 1

provide an indication of inadvertent positive reactivity changes when the reactor is in a shutdown condition (i.e., MODES 3, 4, and 5). Based on this indication, operator action can be taken to

② INSERT 2

The required BDMI consists of one OPERABLE channel of the two channels of source range instrumentation. The requirement for an OPERABLE source range channel ensures the capability to monitor core reactivity and detect a boron dilution event. In order to promptly detect the event in MODES 3, 4, and 5 the required source range instrumentation must provide visual, audible (count rate indication), and alarm in the control room.

The source range neutron flux monitors are used to monitor the core reactivity condition. The installed source range neutron flux monitors are part of the Nuclear Instrumentation System (NIS). These detectors are located external to the reactor vessel and detect neutrons leaking from the core.

The installed source range neutron flux monitors are dual chamber unguarded fission chamber detectors. The detectors monitor the neutron flux in counts per second. The instrument range covers six decades of neutron flux (1E+6 cps). The detectors also provide continuous visual indication in the control room, an audible count rate (selectable between the two source range neutron flux channels), and a high flux at shutdown alarm to alert operators to a possible dilution accident.

② INSERT 3

One OPERABLE source range neutron flux channel is required to provide a signal to alert the operator to unexpected changes in core reactivity. Following reactor shutdown the high flux at shutdown alarm setting will be automatically adjusted downward to a nominal value of 3 times the background count rate as the background count rate reduces. The operator does not depend entirely on this alarm setpoint but has audible indication of increasing neutron flux from the audible count rate drawer and visual indication from counts per second meters for each channel on the main control board and source range drawer. The audible count rate from the source range neutron flux monitors provides prompt and definite indication of any boron dilution. The count rate increase is proportional to the subcritical multiplication factor and allows operators to promptly recognize the initiation of a boron dilution event. Two cases are analyzed for a boron dilution accident following reactor shutdown, beginning of life (BOL) with equilibrium xenon and BOL with a clean core. The analysis shows that for both cases > 15 minutes following the high flux at shutdown alarm for operator action time is available before reaching a keff of 1.0. Therefore, the acceptance criterion for this event is met. The source range neutron flux monitoring channel is credited in the boron dilution accident in UFSAR Section 15.2.4 (Ref. 1).

②

INSERT 4

for instrumentation necessary to detect a boron dilution event and monitor core reactivity. In the applicable plant condition, the specified instrumentation is required to provide a core reactivity monitoring function and is not required to provide a trip function. Therefore, in MODES 3, 4, and 5 a single OPERABLE source range channel with visual, audible (count rate indication), and alarm in the control room is required to provide prompt indication of an inadvertent boron dilution.

APPLICABILITY

The BD~~PS~~ MI must be OPERABLE in MODES ~~[2],~~ 3, 4, and 5 because the safety analysis identifies this system as the primary means INSERT 5 to mitigate an inadvertent boron dilution of the RCS. ① ③ ②

The BD~~PS~~ MI 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." ① ③

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~~ high flux at shutdown alarm to be blocked during reactor startup in MODE~~S 2 and~~ 3. Blocking the ~~flux doubling signal~~ high flux at shutdown alarm is acceptable during startup while in MODE 3, provided the reactor trip breakers are closed with the intent to withdraw rods for startup. ②

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~~ channel is ~~less conservative than~~ outside the tolerance specified by the calibration procedure, the channel must be ~~declared inoperable immediately~~ evaluated and the appropriate Condition entered.

~~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.~~ ④

② INSERT 5

to indicate the need for operator action

BASES

ACTIONS (continued)

A

~~B~~.1, ~~B~~.2.1, ~~B~~.2.2.1, and ~~B~~.2.2.2 ④

the required channel

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. ② ④ ②

A

the required channel

in one of the required valve combinations

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 BD~~PS 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. ② ④ ② ①

A

MI is

the required channel

are required to immediately take action

A

A

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 BD~~PS~~ 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. ④ ①

MI

A

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. ④ ⑤

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

~~The BDPS trains are subject to a COT and a CHANNEL CALIBRATION.~~ ②

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. 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.

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 ~~senor~~ sensor or the signal processing equipment has drifted outside its limit. ⑥

~~[The Frequency of 12 hours 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.~~ ⑦

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ ⑧
~~--]~~

SR 3.3.9.2

SR 3.3.9.2 requires the performance of a COT to ensure that ~~each train~~ the required channel of the BD~~PS~~ MI and associated ~~trip~~ alarm 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~~ High Flux at Shutdown alarm setpoint is ~~equal to or less than an increase of twice the count rate within a 10 minute period~~ three times the background count rate. ① ②
There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found ~~setting~~ settings are consistent with those established by the setpoint methodology. ⑥

~~[The Frequency of [184] days is consistent with the requirements for source range channels in WCAP-15376 (Ref. 2).~~ ⑦

~~OR~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

SR 3.3.9.3

SR 3.3.9.3 is the performance of a CHANNEL CALIBRATION. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor ~~except the neutron detector of the SRM circuit~~. ② There is a plant specific program which verifies that the instrument channel functions as required by verifying and as-left and as-found setting are consistent with those established by the setpoint methodology. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. ~~For the BDPS,~~ the CHANNEL

INSERT 6

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.~~ ②

~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~

~~OR~~ ⑦

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

REFERENCES

1. U FSAR, Section ~~Chapter~~ ~~[~~15 2.4 ~~]~~. ② ③

~~2. WCAP-15376, Revision 0, October 2000.~~ ②

② INSERT 6

checking the discriminator voltage and adjusting if necessary.

This SR is modified by a Note that states that neutron detectors are excluded from the CHANNEL CALIBRATION.

B 3.3 INSTRUMENTATION

B 3.3.9~~A~~ Boron Dilution ~~Protection~~ Monitoring Instrumentation ~~System~~ (BD~~PS~~ MI) ~~(Without Setpoint Control Program)~~ ①

BASES

BACKGROUND

The primary purpose of the BD~~PS~~ MI is to INSERT 1 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)~~. ① ② ②

INSERT 2 ~~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.~~ ②

~~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.~~

APPLICABLE SAFETY ANALYSES

The BD~~PS~~ MI 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)~~. INSERT 3 ~~The accident analyses rely on automatic BDPS actuation to mitigate the consequences of inadvertent boron dilution events.~~ ① ②

The BD~~PS~~ MI satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

LCO 3.3.9 provides the requirements for OPERABILITY INSERT 4 ~~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. ②

~~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.~~

② INSERT 1

provide an indication of inadvertent positive reactivity changes when the reactor is in a shutdown condition (i.e., MODES 3, 4, and 5). Based on this indication, operator action can be taken to

② INSERT 2

The required BDMI consists of one OPERABLE channel of the two channels of source range instrumentation. The requirement for an OPERABLE source range channel ensures the capability to monitor core reactivity and detect a boron dilution event. In order to promptly detect the event in MODES 3, 4, and 5 the required source range instrumentation must provide visual, audible (count rate indication), and alarm in the control room.

The source range neutron flux monitors are used to monitor the core reactivity condition. The installed source range neutron flux monitors are part of the Nuclear Instrumentation System (NIS). These detectors are located external to the reactor vessel and detect neutrons leaking from the core.

The installed source range neutron flux monitors are dual chamber unguarded fission chamber detectors. The detectors monitor the neutron flux in counts per second. The instrument range covers six decades of neutron flux (1E+6 cps). The detectors also provide continuous visual indication in the control room, an audible count rate (selectable between the two source range neutron flux channels), and a high flux at shutdown alarm to alert operators to a possible dilution accident.

② INSERT 3

One OPERABLE source range neutron flux channel is required to provide a signal to alert the operator to unexpected changes in core reactivity. Following reactor shutdown the high flux at shutdown alarm setting will be automatically adjusted downward to a nominal value of 3 times the background count rate as the background count rate reduces. The operator does not depend entirely on this alarm setpoint but has audible indication of increasing neutron flux from the audible count rate drawer and visual indication from counts per second meters for each channel on the main control board and source range drawer. The audible count rate from the source range neutron flux monitors provides prompt and definite indication of any boron dilution. The count rate increase is proportional to the subcritical multiplication factor and allows operators to promptly recognize the initiation of a boron dilution event. Two cases are analyzed for a boron dilution accident following reactor shutdown, beginning of life (BOL) with equilibrium xenon and BOL with a clean core. The analysis shows that for both cases > 15 minutes following the high flux at shutdown alarm for operator action time is available before reaching a keff of 1.0. Therefore, the acceptance criterion for this event is met. The source range neutron flux monitoring channel is credited in the boron dilution accident in UFSAR Section 15.2.4 (Ref. 1).

② **INSERT 4**

for instrumentation necessary to detect a boron dilution event and monitor core reactivity. In the applicable plant condition, the specified instrumentation is required to provide a core reactivity monitoring function and is not required to provide a trip function. Therefore, in MODES 3, 4, and 5 a single OPERABLE source range channel with visual, audible (count rate indication), and alarm in the control room is required to provide prompt indication of an inadvertent boron dilution.

BASES

APPLICABILITY

The BD~~PS~~ MI must be OPERABLE in MODES ~~[2],~~ 3, 4, and 5 because the safety analysis identifies this system as the primary means INSERT 5 to mitigate an inadvertent boron dilution of the RCS. ① ③ ②

The BD~~PS~~ MI 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." ① ③

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~~ high flux at shutdown alarm ~~dilution flux doubling signal~~ to be blocked during reactor startup in MODE~~S 2 and~~ 3. Blocking the ~~flux~~ high flux at shutdown alarm ~~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. ②

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~~ channel ~~Setpoint~~ is outside ~~less conservative than~~ the tolerance specified by the calibration procedure, the channel must be ~~declared inoperable~~ evaluated ~~immediately~~ and the appropriate Condition entered.

~~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.~~ ④

② INSERT 5

to indicate the need for operator action

BASES

ACTIONS (continued)

A

~~B~~.1, ~~B~~.2.1, ~~B~~.2.2.1, and ~~B~~.2.2.2 ④

the required channel

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. ② ④ ②

A

the required channel

in one of the required valve combinations

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 BD~~PS 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. ② ④ ② ①

A

MI is

the required channel

are required to immediately take action

A

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 BD~~PS~~ 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. ④ ①

MI

A

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. ④ ⑤

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

~~The BDPS trains are subject to a COT and a CHANNEL CALIBRATION.~~ ②

Performance of the CHANNEL CHECK ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. 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.

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 ~~senor~~ sensor or the signal processing equipment has drifted outside its limit. ⑥

~~[The Frequency of 12 hours 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.~~

~~OR~~ ⑦

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ ⑧

SR 3.3.9.2

SR 3.3.9.2 requires the performance of a COT to ensure that ~~each train~~ the required channel of the BD~~PS~~ MI and associated ~~trip~~ alarm setpoint are fully operational. 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.~~ This test shall include verification that the ~~boron dilution~~ High Flux at Shutdown alarm setpoint is ~~equal to or less than an increase of twice the count rate within a 10 minute period~~ three times the background count rate. ② There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found ~~setting~~ settings are consistent with those established by the setpoint methodology. ⑥

~~[The Frequency of [184] days is consistent with the requirements for source range channels in WCAP-15376 (Ref. 2).~~

~~OR~~ ⑦

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

SR 3.3.9.3

SR 3.3.9.3 is the performance of a CHANNEL CALIBRATION. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor ~~except the neutron detector of the SRM circuit~~. ② There is a plant specific program which verifies that the instrument channel functions as required by verifying and as-left and as-found setting are consistent with those established by the setpoint methodology. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. ~~For the BDPS,~~ the CHANNEL

INSERT 6

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.~~ ②

~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~

~~OR~~ ⑦

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ ⑧

REFERENCES

1. U FSAR, ~~Chapter~~ Section ~~[~~15~~]~~ 2.4. ② ③

~~2. WCAP-15376, Revision 0, October 2000.~~ ②

② **INSERT 6**

checking the discriminator voltage and adjusting if necessary.

This SR is modified by a Note that states that neutron detectors are excluded from the CHANNEL CALIBRATION.

JUSTIFICATION FOR DEVIATIONS
ITS 3.3.9 BASES, BORON DILUTION MONITORING INSTRUMENTATION (BDMI)

1. The type of Setpoint Control Program (Without Setpoint Control Program) and the Specification designator "A" are deleted since they are unnecessary. This information is provided in NUREG 1431, Rev. 4.0 to assist in identifying the appropriate Bases to be used as a model for the plant specific ITS conversion, but serves no purpose in the plant specific implementation. In addition, ISTS B 3.3.9B (with Setpoint Control Program Specification) is not used and is not shown. Additionally, the title of the Bases has been changed from "Boron Dilution Protection System (BDPS)" to "Boron Dilution Monitoring Instrumentation (BDMI)" since an actual "Protection System" does not exist at SQN.

2. 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.

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

4. Changes have been made to be consistent with changes made to the Specification.

5. The paragraph has been moved to after the discussion on Required Action B.1 since the Note is associated with Required Action B.1.

6. Typographical/grammatical error corrected.

7. ISTS SR 3.3.9.1, SR 3.3.9.2 and SR 3.3.9.3 Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.9, BORON DILUTION MONITORING INSTRUMENTATION (BDMI)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 10

Relocated/Deleted Current Technical Specifications (CTS)

CTS 3/4.3.3.10, EXPLOSIVE GAS MONITORING INSTRUMENTATION

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

~~INSTRUMENTATION~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION~~

~~LIMITING CONDITION FOR OPERATION~~

~~3.3.3.10 The explosive gas monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.ll.2.5 are not exceeded.~~

~~APPLICABILITY: As shown in Table 3.3-13~~

~~ACTION:~~

~~a. With an explosive gas monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, declare the channel inoperable and take the ACTION shown in Table 3.3-13.~~

~~b. With less than the minimum number of explosive gas monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-13. Restore the inoperable instrumentation to OPERABLE status within 30 days and, if unsuccessful, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2.1 to explain why this inoperability was not corrected in a timely manner.~~

~~c. The provisions of Specification 3.0.3 are not applicable.~~

R01

~~SURVEILLANCE REQUIREMENTS~~

~~4.3.3.10 Each explosive gas monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST at the frequencies shown in Table 4.3-9.~~

~~TABLE 3.3-13~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION~~

	~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABILITY~~	~~ACTION~~
~~1.~~	~~Deleted~~			
~~2.~~	~~WASTE GAS DISPOSAL SYSTEM EXPLOSIVE GAS MONITORING SYSTEM~~			
	~~a. Hydrogen and Oxygen Monitors~~	~~2~~	~~**~~	~~43~~

R01

~~TABLE 3.3-13 (Continued)~~

~~TABLE NOTATION~~

~~** During waste gas compressor operation.~~

~~ACTION 40 - Not used.~~

~~ACTION 41 - Not used.~~

~~ACTION 42 - Not used.~~

~~ACTION 43 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of this waste gas disposal system may continue provided grab samples are taken and analyzed either (1) every 4 hours during degassing operations of the reactor coolant system or (2) daily during other operations.~~

~~ACTION 44 - Not Used.~~

R01

~~TABLE 4.3-9~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

~~INSTRUMENT~~	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	~~CHANNEL FUNCTIONAL TEST~~	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
~~1. Deleted~~				
~~2. WASTE GAS DISPOSAL SYSTEM EXPLOSIVE GAS MONITORING SYSTEM~~				
~~a. Hydrogen Monitor~~	~~D~~	~~Q(4)~~	~~M~~	~~**~~
~~b. Oxygen Monitor~~	~~D~~	~~Q(5)~~	~~M~~	~~**~~

R01

~~TABLE 4.3-9 (Continued)~~

~~TABLE NOTATION~~

~~** During waste gas compressor operation.~~

~~(1) Not Used.~~

~~(2) Not Uses.~~

~~(3) Not Used.~~

~~(4) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:~~

~~1. One volume percent hydrogen, balance nitrogen, and~~

~~2. Four volume percent hydrogen, balance nitrogen.~~

~~(5) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:~~

~~1. One volume percent oxygen, balance nitrogen, and~~

~~2. Four volume percent oxygen, balance nitrogen.~~

R01

~~INSTRUMENTATION~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION~~

~~LIMITING CONDITION FOR OPERATION~~

~~3.3.3.10 The explosive gas monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.5 are not exceeded.~~

~~APPLICABILITY: As shown in Table 3.3-13~~

~~ACTION:~~

- ~~a. With an explosive gas monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, declare the channel inoperable and take the ACTION shown in Table 3.3-13.~~
- ~~b. With less than the minimum number of explosive gas monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-13. Restore the inoperable instrumentation to OPERABLE status within 30 days and, if unsuccessful, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2.1 to explain why this inoperability was not corrected in a timely manner.~~
- ~~c. The provisions of Specification 3.0.3 are not applicable.~~

R01

~~SURVEILLANCE REQUIREMENTS~~

~~4.3.3.10 Each explosive gas monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST at the frequencies shown in Table 4.3-9.~~

~~TABLE 3.3-13~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION~~

~~INSTRUMENT~~	~~MINIMUM CHANNELS OPERABLE~~	~~APPLICABILITY~~	~~ACTION~~
~~1. DELETED~~			
~~2. WASTE GAS DISPOSAL SYSTEM EXPLOSIVE GAS MONITORING SYSTEM~~			
~~a. Hydrogen and Oxygen Monitors~~	~~2~~	~~**~~	~~43~~

R01

~~TABLE 3.3-13 (Continued)~~

~~TABLE NOTATION~~

~~** During waste gas compressor operation.~~

~~ACTION 40 - Not used.~~

~~ACTION 41 - Not used.~~

~~ACTION 42 - Not used.~~

~~ACTION 43 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of this waste gas disposal system may continue provided grab samples are taken and analyzed either (1) every 4 hours during degassing operations of the reactor coolant system or (2) daily during other operations.~~

~~ACTION 44 - Not used.~~

R01

CTS 3/4.3.3.10

~~TABLE 4.3-9~~

~~EXPLOSIVE GAS MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS~~

~~INSTRUMENT~~	~~CHANNEL CHECK~~	~~CHANNEL CALIBRATION~~	~~CHANNEL FUNCTIONAL TEST~~	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
~~1. DELETED~~				
~~2. WASTE GAS DISPOSAL SYSTEM EXPLOSIVE GAS MONITORING SYSTEM~~				
~~a. Hydrogen Monitor~~	~~D~~	~~Q(4)~~	~~M~~	~~**~~
~~b. Oxygen Monitor~~	~~D~~	~~Q(5)~~	~~M~~	~~**~~

R01

~~November 16, 1990~~

~~TABLE 4.3-9 (Continued)~~

~~TABLE NOTATION~~

~~** During waste gas compressor operation.~~

~~(1) Not Used.~~

~~(2) Not Used.~~

~~(3) Not Used.~~

~~(4) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:~~

~~1. One volume percent hydrogen, balance nitrogen, and~~

~~2. Four volume percent hydrogen, balance nitrogen.~~

~~(5) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:~~

~~1. One volume percent oxygen, balance nitrogen, and~~

~~2. Four volume percent oxygen, balance nitrogen.~~

R01

DISCUSSION OF CHANGES
CTS 3/4.3.3.10, EXPLOSIVE GAS MONITORING INSTRUMENTATION

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3/4.3.3.10 provides the requirements for the explosive gas monitoring instrumentation. The Explosive Gas Monitoring Instrumentation Specification is provided to ensure that the concentration of potentially explosive gas mixtures contained in the gaseous waste processing system is adequately monitored, which will help ensure that the concentration is maintained below the flammability limit. However, the system is designed to contain detonations, and detonations would affect the function of any safety related equipment. The concentration of oxygen in the gaseous Waste Processing System is not an initial assumption of any design basis accident (DBA) or transient analysis. This Specification does not meet the criteria for retention in the Improved Technical Specification (ITS); therefore, it will be retained in the Technical Requirements Manual.

This change is acceptable because CTS 3/4.3.3.10 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. Explosive gas monitoring instrumentation is not used for, nor capable of, detection a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Explosive Gas Monitoring Instrumentation Specification does not satisfy criterion 1.

2. Explosive gas monitoring instrumentation is not used to indicate the status of, or monitor a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient. In addition, excessive system oxygen is not an indication of a DBA or transient. The Explosive Gas Monitoring Instrumentation does not satisfy criterion 2.

3. Explosive gas monitoring instrumentation is not part of a primary success path in the mitigation of a DBA or transient. In addition, excessive oxygen discharge is not part of a primary success path in mitigating a DBA or transient. The Explosive Gas Monitoring Instrumentation Specification does not satisfy criterion 3.

4. As discussed in Section 4.0 (Appendix A, page A-69) and summarized in Table 1 of WCAP-11618, the loss of the explosive gas monitoring instrumentation was found to be a non-significant risk contributor to core damage frequency and offsite releases. TVA has reviewed this evaluation, considers it applicable to Sequoyah Nuclear Plant (SQN)

DISCUSSION OF CHANGES
CTS 3/4.3.3.10, EXPLOSIVE GAS MONITORING INSTRUMENTATION

Units 1 and 2, and concurs with the assessment. The Explosive Gas Monitoring Instrumentation Specification does not satisfy criterion 4.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Explosive Gas Monitoring Instrumentation LCO and Surveillances may be relocated out of the Technical Specifications. The Explosive Gas Monitoring 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 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

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3/4.3.3.10, EXPLOSIVE GAS MONITORING INSTRUMENTATION

There are no specific No Significant Hazards Considerations for this Specification.