CTS

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

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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

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.	2 ~~[92 days on a STAGGERED TEST BASIS~~ ~~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.	2 ~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 5
DOC M04	SR 3.3.2.~~6~~ 5 Perform SLAVE RELAY TEST.	2 ~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 5

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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

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CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.2~~A~~

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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
1.c	c. Containment Pressure - High ~~1~~	1,2,3	3	D	SR 3.3.2.1 4 SR 3.3.2.~~5~~(b)(c) 8 SR 3.3.2.~~9~~(b)(c) 9 SR 3.3.2.~~10~~	≤ ~~[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 4 SR 3.3.2.~~5~~(b)(c) 8 SR 3.3.2.~~9~~(b)(c) 9 SR 3.3.2.~~10~~	≥ ~~[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 4 SR 3.3.2.~~5~~(b)(c) 8 SR 3.3.2.~~9~~(b)(c) 9 SR 3.3.2.~~10~~	≥ [~~635~~]~~(d)~~ 592.2 psig	~~[676]~~(d) 600 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.~~ Safety Injection, Pressurizer Pressure - Low and Safety Injection, Steam Line Pressure - Low may be bypassed below the P-11 (Pressurizer Pressure) interlock. 2

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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

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.2~~A~~

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						
2.a a. Manual Initiation	1,2,3,4	2 per train, 2 trains	B	SR 3.3.2.~~8~~ 7	NA	NA

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[~~(l)~~] TRIP SETPOINT~~]~~	
	2. Containment Spray							3
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~~

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

CTS

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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
3.b.3)	(3) Containment Pressure ~~High - 3 (~~High High~~)~~	1,2,3	~~[~~4~~]~~	E	4 SR 3.3.2.1 8 SR 3.3.2.~~5~~(b)(c) SR 3.3.2.~~9~~(b)(c) 9 SR 3.3.2.~~10~~	≤ ~~[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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
4.c	c. Containment Pressure - High ~~2~~ -High	1,2 ~~(j)~~ e,3 ~~(j)~~ e	~~[~~4~~]~~	~~D~~ E	4 SR 3.3.2.1 8 SR 3.3.2.~~5~~(b)(c) SR 3.3.2.~~9~~(b)(c) 9 SR 3.3.2.~~10~~	≤ ~~[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

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.2~~A~~

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~~(i)~~ (d) TRIP SETPOINT~~]~~
	4. Steam Line Isolation						
	d. Steam Line Pressure						
4.d	(1) Low	1,2~~(i)~~ e,3~~(i)~~ ~~(a)~~ f	3 per steam line	D	SR 3.3.2.1 4, SR 3.3.2.~~5~~ 8 (b)(c), SR 3.3.2.~~9~~ 9 (b)(c), SR 3.3.2.~~10~~	≥ ~~[635]~~ 592.2 (d) psig	~~[675]~~ 600 (d) psig
4.e	(2) Negative Rate - High	3 ~~(h)~~ g ~~(j)~~ e	3 per steam line	D	SR 3.3.2.1 4, SR 3.3.2.~~5~~ 8 (b)(c), SR 3.3.2.~~9~~ 9 (b)(c), SR 3.3.2.~~10~~	≤ ~~[121.6]~~ 107.8 ~~(i)~~ h psi	~~[110]~~ 100.0 ~~(i)~~ h psi

Note # ~~(a)~~ f ~~Above the P-11 (Pressurizer Pressure) interlock.~~ ~~When Steam Line Isolation on Steam Line Pressure, Negative Rate–High is blocked~~ 2 KAB024

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.

Table 3.3-4 Note 1 (d) Time constants used in the lead/lag controller are τ_1 ≥ ~~[~~50~~]~~ seconds and τ_2 ≤ ~~[~~5~~]~~ seconds.

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~~

Table 3.3-4 Note 2 ~~(i)~~ h Time constant utilized in the rate/lag controller is τ_1 ≥ ~~[~~50~~]~~ seconds. KAB030

DOC L04 ~~(j)~~ e 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.~~

Steam Line Isolation, Steam Line Pressure - Low may be bypassed below the P-11 (Pressurizer Pressure) interlock.

KAB024

Steam Line Isolation, Steam Line Pressure Negative Rate-High is automatically blocked above P-11 and may be blocked below P-11 when Safety Injection, Steam Line Pressure - Low is not blocked.

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CTS

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~~

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

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CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~
3.3.2~~A~~

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~~]~~
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].~~

~~REVIEWER'S NOTE~~

~~(l) 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 8 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
	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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA 3
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 4 SR 3.3.2.~~5~~ (b)(c) 8 SR 3.3.2.~~9~~ (b)(c) 9 SR 3.3.2.~~10~~	≤ ~~[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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
	~~b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.3~~	~~NA~~	~~NA~~

KAB017

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 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

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL~~(l)~~ TRIP SETPOINT~~]~~	
	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 INSERT 13	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 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 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	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

CTS 3.3.2

6

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)

CTS 3.3.2

6

INSERT 10

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)

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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.	

3

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Table 3.3-4
6.g

Allowable Value	Nominal Trip Setpoint
≥ 2.44 psig (motor driven pump)	3.21 psig (motor driven pump)
≥ 12 psig (turbine driven pump)	13.9 psig (turbine driven pump)

CTS 3.3.2

2

INSERT 13

CTS	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

8

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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.

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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~~(f)]~~ 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(b)(c)~~ ~~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(b)(c) SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8 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(b)(c) SR 3.3.2.~~5~~ 4(b)(c) SR 3.3.2.~~9~~ 8 SR 3.3.2.~~10~~ 9	~~≥ [30]~~ ≤ 31.68 in and ≥ 28.32 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~~

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

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CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.2~~A~~

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~~	~~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~~

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

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CTS

3.3.2

2

INSERT 15

	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 3.3-2, 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

Insert Page 3.3.2-21

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.

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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)

1

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.~~

~~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).

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.

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,

 1

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. Analytical Limits are defined in FSAR, 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 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. 4 2 4 2 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

, setpoint comparators, or contacts

The trip setpoints used in the bistables 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]~~. The magnitudes of these uncertainties are factored into the 4
UFSAR Section 7.1.2
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]~~ to account for 4
Allowable Value
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)

The ~~[~~NTSP~~]~~ is the value at which the bistables or setpoint comparators 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 or setpoint comparator 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>

The SSPS equipment is used for the decision logic processing of outputs from the signal processing equipment bistables, setpoint comparators, or contacts. 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

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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. Safety Injection

Safety Injection (SI) provides two primary functions:

1. Primary side water addition to ensure maintenance or recovery of reactor vessel water level (coverage of the active fuel for heat removal, clad integrity, and for limiting peak clad temperature to < 2200°F), and

2. Boration to ensure recovery and maintenance of SDM (k_{eff}< 1.0).

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.

1

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.

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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

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.

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 1

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~~ approximately lead/lag ratio of 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

1

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).~~

~~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

1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2. Containment Spray

to

Containment Spray ~~provides three primary~~ functions~~:~~

~~1.~~ ~~L~~owers 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~~.

2

This is

~~These~~ function~~s are~~ necessary to~~:~~

~~•~~ ~~E~~nsure 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~~.

2

The containment spray actuation signal starts the containment spray pumps and aligns the discharge of the pumps to the containment spray nozzle headers in the upper levels of containment. Water is initially drawn from the RWST by the containment spray pumps ~~and mixed with a sodium hydroxide solution from the spray additive tank~~. When the RWST reaches the low low level setpoint, the spray pump suctions are shifted to the containment sump if continued containment spray is required. Containment spray is actuated manually by ~~Containment Pressure - High 3 or~~ Containment Pressure - High High.

2

or automatically

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~~ switches in the same train. 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

Phase B & Containment Ventilation Isolation

2

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.

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1

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~~ This arrangement~~s~~ exceeds 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

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, essential raw cooling water, and control air ~~(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~~ component cooling water is required to support RCP operation, not isolating ~~CCW~~ component cooling water on the ~~low pressure~~ 2 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

Phase B containment isolation is actuated by Containment Pressure ~~-~~ ~~High 3 or Containment Pressure - High~~ - 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 High, a large break LOCA or SLB must have occurred ~~and containment spray must~~ 2

1

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. 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. 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.

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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

 1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

c. Steam Line Isolation - Containment Pressure - High~~2~~ -High 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~~2~~ -High provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with two-out-of-three logic. However, for enhanced reliability, this Function was designed with four channels and a two-out-of-four logic. ~~The transmitters and~~ 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

Containment Pressure - High~~2~~ -High must be OPERABLE in MODES 1, 2, and 3, when there is sufficient energy in the primary and secondary side to pressurize the containment following a pipe break. This would cause a significant increase in the containment pressure, thus allowing detection and closure of the MSIVs. The Steam Line Isolation Function remains OPERABLE in MODES 2 and 3 unless all MSIVs are closed ~~and [de-activated]~~. In MODES 4, 5, and 6, there is not enough energy in the primary and secondary sides to pressurize the containment to the Containment Pressure - High~~2~~ -High setpoint. 2 4

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 P-11~~ when the Steam Line Isolation on Steam Line Pressure, Negative Rate-High is blocked), 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.

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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 ~~2~~ -High. 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

1

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~~

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.~~ 2

~~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.~~

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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

1

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 MFRV 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

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~~ pressure in the AFW suction line ~~CST~~ will automatically realign the pump suctions to the Essential Raw Cooling Water (ERCW) ~~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

1

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. 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~~.

2

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.

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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 ~~service bus~~ 6.9 kV shutdown board. Loss of power to either ~~service bus~~ 6.9 kV shutdown board 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 these~~ this 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

e

Function~~s~~ 6.~~f and 6.g~~ must be OPERABLE in MODES 1 and 2. This 5 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~~. 2 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.

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

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5

INSERT 9

a indicating KAB023

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.~~ KAB023

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.

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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 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.~~ containment sump tall strainer submergence. 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 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~~ 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. 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)~~ and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation may be ~~is~~ blocked after a 60 ~~[ ]~~ 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. The functions of the P-4 interlock are: 2 2 4 2

- 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).

1

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.

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, setpoint comparator 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. When the Required Channels in Table 3.3.2-1 are specified on a "per" basis (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.

2 1

1

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~~.

 1

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,~~ 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:~~ 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.~~
~~----------~~

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~~
- Containment Phase B Isolation Containment Pressure - ~~High 3 (~~High~~,~~ - High~~).~~ , and
- Steam Line Isolation Containment Pressure – High-High

2

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. 4
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

G

~~F~~.1, ~~F~~.2.1, and ~~F~~.2.2

G

Condition ~~F~~ 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~~. 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~~, 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 2

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

H

Condition ~~G~~ applies to the automatic actuation logic and actuation relays for the Steam Line Isolation ~~[~~Turbine Trip and Feedwater Isolation,~~]~~ and AFW actuation Functions. 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

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

~~J~~N.1 and ~~J~~N.2

Condition ~~J~~N 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

~~K~~P.1, ~~K~~P.2.1, and ~~K~~P.2.2 2

Condition ~~K~~P 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 ∆T 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.

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INSERT 16

during MODE 1

KAB023

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. 2

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.

If a pressure sensor channel or a time delay channel is inoperable, the associated AFW pump must be declared inoperable immediately.

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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 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 justified in Reference 11. If the channel cannot be returned to OPERABLE status or placed in the bypass condition within 6 hours, the unit must be brought to MODE 3 within the following ~~[~~6~~]~~ hours and MODE 5 within the next 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

~~[~~ 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.~~]~~

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

Q

~~L~~.1, ~~L~~.2.1, and ~~L~~.2.2

Q

Condition ~~L~~ applies to the P-11 ~~and P-12 [and P-14]~~ interlock~~s~~.

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

1

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

2 1

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.

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-----------------------------------~~
~~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.~~ 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 3.3.2.3~~

~~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.~~

~~OR~~

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

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

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. 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.~~

~~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 3.3.2.~~5~~

SR 3.3.2.~~5~~ 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.~~

~~OR~~

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

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

SR 3.3.2.~~5~~ 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

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.

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

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.

SR 3.3.2.~~6~~ 5

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~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.2.~~7~~ 6

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.~~

~~OR~~

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

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

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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.~~

~~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 3.3.2.8 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

1

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.

8

SR 3.3.2.~~9~~ 2

8

SR 3.3.2.~~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.

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.~~
~~-----]~~

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.

8

SR 3.3.2.~~9~~ 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 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.~~

~~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.~~
~~---]~~

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

 1

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.

1

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,

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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.~~

~~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.~~ 3

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. Analytical Limits are defined in FSAR, 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 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. 4 2 4 2 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 Allowable Value ~~[NTSP]~~ 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

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.

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 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

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. Safety Injection

Safety Injection (SI) provides two primary functions:

1. Primary side water addition to ensure maintenance or recovery of reactor vessel water level (coverage of the active fuel for heat removal, clad integrity, and for limiting peak clad temperature to $< 2200°F$), and

2. Boration to ensure recovery and maintenance of SDM ($k_{eff} < 1.0$).

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.

 1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

hand switch

Each channel consists of one ~~push button~~ and the interconnecting wiring to the actuation logic cabinet. Each ~~push button~~ 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.

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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

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~~

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

to

Containment Spray ~~provides three primary~~ functions~~:~~ 2

~~1.~~ ~~L~~owers 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~~.

This is

~~These~~ functions ~~are~~ necessary to~~:~~ 2

~~•~~ ~~E~~nsure 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

or automatically

manually by ~~Containment Pressure - High 3 or~~ Containment Pressure - High High. 2

-

a. Containment Spray - Manual Initiation

Phase B & Containment Ventilation Isolation

The operator can initiate containment spray at any time from the control room by simultaneously turning two ~~containment spray actuation~~ 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.

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1

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. 2

This

s

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~~. 4 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 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

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~~ 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

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

1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~have been actuated~~. RCP operation will no longer be required and component cooling water ~~CCW~~ to the RCPs is, therefore, no longer necessary. The RCPs can be operated with seal injection flow alone and without component cooling water ~~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 Ventilation ~~Purge~~ 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 an accident ~~a DBA~~, but because of the large number of components actuated on a Phase A Containment Isolation, actuation is simplified by the use of the manual actuation 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 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~~. 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~~. 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~~ s initiate 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 ~~2~~ -High 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 ~~2~~ -High provides no input to any control functions. Thus, three OPERABLE channels are sufficient to satisfy protective requirements with two-out-of-three logic. However, for enhanced reliability, this Function was designed with four channels and a two-out-of-four logic. ~~The transmitters and electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions, and the [NTSP] reflects only steady state instrument uncertainties~~ INSERT 5. 2

Containment Pressure - High ~~2~~ -High must be OPERABLE in MODES 1, 2, and 3, when there is sufficient energy in the primary and secondary side to pressurize the containment following a pipe break. This would cause a significant increase in the containment pressure, thus allowing detection and closure of the MSIVs. The Steam Line Isolation Function remains OPERABLE in MODES 2 and 3 unless all MSIVs are closed ~~and [de-activated]~~. In MODES 4, 5, and 6, there is not enough energy in the primary and secondary sides to pressurize the containment to the Containment Pressure - High ~~2~~ -High setpoint. 2 4

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 P-11~~ when the Steam Line Isolation on Steam Line Pressure, Negative Rate-High is blocked), with any main steam valve open, when a secondary side break or stuck open

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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 ~~2~~ -High. 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) <u>Steam Line Pressure - Negative Rate – High</u>

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~~

1

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

2 1

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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.

This Function is actuated by SG Water Level - High High, or by a SI signal. The nominal trip setpoint and allowable value limits are a percentage of the narrow range instrument span for each steam generator. 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 MFRV 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

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~~ pressure in the ~~CST~~ AFW suction line will automatically realign the pump suctions to the Essential ~~Service Water (ESW)~~ Raw Cooling Water (ERCW) 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. 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,~~ , with a two-out-of-three logic, only three protection channels 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~~. 2

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.

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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 6.9 kV Unit-boards (RCP buses) ~~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 6.9 kV shutdown board ~~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

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.

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1

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.~~ 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. 2

INSERT 9 5

e

Function~~s~~ 6.~~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.~~ Auxiliary Feedwater - Pump Suction Transfer on Suction Pressure – Low 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~~. E~~S~~RCW (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

a indicating

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~~. KAB023

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.~~ KAB023

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

 1

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 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.~~ containment sump tall strainer submergence. 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 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~~ 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. 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)~~ and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation may be ~~is~~ blocked after a 60 ~~[ ]~~ 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. The functions of the P-4 interlock are: 2 2 4 2

- 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. <u>Engineered Safety Feature Actuation System Interlocks - Pressurizer Pressure, P-11</u>

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

1

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.

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, setpoint comparator 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. When the Required Channels in Table 3.3.2-1 are specified on a "per" basis (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

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,~~ 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. 2 The 72 hours allowed to restore the channel to OPERABLE status or to place it in the tripped condition is justified in Reference 9.

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-----~~ 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 up to 12 hours while performing routine surveillance testing. The 12 hour time limit is justified in Reference 9.~~

~~-----~~

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~~
- Containment Phase B Isolation Containment Pressure - ~~High 3 (~~High~~,~~ - High~~).~~ , and
- Steam Line Isolation Containment Pressure – High-High

2

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

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 12 hour time limit is justified in Reference 9.~~

3

INSERT 11

G

~~F~~.1, ~~F~~.2.1, and ~~F~~.2.2

G

Condition ~~F~~ 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~~. 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~~, 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

2

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.

1

BASES

ACTIONS (continued)

H

~~G~~.1, ~~G~~.2.1, and ~~G~~.2.2

2

H

Condition ~~G~~ applies to the automatic actuation logic and actuation relays for the Steam Line Isolation ~~[~~Turbine Trip and Feedwater Isolation,~~]~~ and AFW actuation Functions.

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.]~~

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

~~J~~N.1 and ~~J~~N.2

Condition ~~J~~N 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

~~K~~P.1, ~~K~~P.2.1, and ~~K~~P.2.2 2

Condition ~~K~~P 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.

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INSERT 16

during MODE 1

KAB023

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. 2

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.

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 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 justified in Reference 11. If the channel cannot be returned to OPERABLE status or placed in the bypass condition within 6 hours, the unit must be brought to MODE 3 within the following ~~[~~6~~]~~ hours and MODE 5 within the next 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

~~[~~ 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.~~]~~

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

Q

~~L~~.1, ~~L~~.2.1, and ~~L~~.2.2

Q

Condition ~~L~~ applies to the P-11 ~~and P-12 [and P-14]~~ interlock~~s~~.

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

1

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

2 1

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.

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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.~~

~~OR~~

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

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

SR 3.3.2.2

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~~

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

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

~~SR 3.3.2.3~~

~~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~~

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.~~

~~OR~~

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

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

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. 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.~~

~~OR~~

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

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.~~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.~~

~~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.~~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.~~ 8

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.3.2.~~7~~ 6

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.~~

~~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 3.3.2.~~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.~~

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

~~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].~~

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

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~~

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.~~
~~-----]~~ 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 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

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.

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 SR 3.3.2.~~11~~ 10 (ITS SR 3.3.2.1 through ITS SR 3.3.2.~~10~~ 9) 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 SR 3.3.2.~~10~~ 9 is "In accordance with the Surveillance Frequency Control Program." KAB056

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 ΔT) and Functional Unit 6.c.ii.c (Auxiliary Feedwater, Main Stm. Gen Water Level – Low-Low, Start Turbine-Driven Pump, RCS Loop ΔT). 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.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

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 ∆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.

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.

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ATTACHMENT 3

ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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

ITS A01 ITS 3.3.3

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

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ITS A01 ITS 3.3.3

Table 3.3.3-1

TABLE 3.3-10

ITS ACTION

ACCIDENT MONITORING INSTRUMENTATION

LA03 LA04

	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~~	~~3~~ 1/steam generator (a)	5	A, B, E, and H

LA04 A03 KAB036 LA05

Add proposed Table 3.3.3-1 Footnote (a) A03

KAB036

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
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

(b) KAB036

~~(c)~~ A04

LA05

(b) KAB036

Add proposed Table 3.3.3-1 Footnote ~~(c)~~ A04

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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
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		A05	
a. Motor Driven Pumps ~~(Instrument Loops 3-116A, -116B, -126A, -126B)~~	~~1/Train/Pump (2 Valves/Train)~~	2 (d) ~~1/Train/Pump (2 Valves/Train)~~	KAB037 1 A, B, C, and H
b. Turbine Driven Pumps ~~(Instrument Loops 3-136A, -136B, -179A, -179B)~~	~~2 Trains (2 Valves/Train)~~	2 (d) ~~2 Trains (2 Valves/Train)~~	KAB037 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~~	~~1/Valve~~## (f) ~~(b)~~ 2 per penetration flow path	KAB036 3 A, C, and H

LA04 A06 A06 LA05

Table 3.3.3-1 Footnote ~~(d)~~ (c) KAB036

#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)~~ (e) KAB036 L03

(f) KAB036

~~(b)~~ Only one position indication channel is required for penetration flow paths with only one installed control room indication channel. A06

Add Note (d)

(d) A channel consists of two valve position indicators associated with the in-series valves in a single suction line. KAB037 A05

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

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 ### 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 3.3.3-1 (e) Footnote ~~(a)~~ KAB036

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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 (e) 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~~.

KAB036

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 (e) Footnote ~~(a)~~

KAB036

ACTION H

KAB036

Table 3.3.3-1 (f) 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

ACTION I 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~~. 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~~

ACTION B ~~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 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

ACTION H HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the next 6 hours.

INSTRUMENTATION

FIRE DETECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 This Specification is deleted.

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TABLE 3.3-11

FIRE DETECTION INSTRUMENTS

This Table is deleted.
(Pages 3/4 3-59 through 3/4 3-69 deleted)

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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.

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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

	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~~	~~3~~ 1/steam generator (a)	5	A, B, E, and H

LA04

LA04

A03 KAB036

LA05

Add proposed Table 3.3.3-1 Footnote (a) A03

KAB036

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ITS | A01 | ITS 3.3.3

Table 3.3.3-1 | 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)~~	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 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

(b) KAB036 ~~(c)~~ A04

LA05

(b) KAB036

Add proposed Table 3.3.3-1 Footnote ~~(c)~~ A04

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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
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)~~ (d)	KAB037 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~~ (d) ~~(2 Valves/Train)~~	KAB037 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)~~ (f) ~~1/Valve~~## 2 per penetration flow path	KAB036 3 A, C, and H

A05

LA04

A06

A06

LA05

Table 3.3.3-1 Footnote ~~(d)~~ (c) # Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint. KAB036

Table 3.3.3-1 Footnote ~~(a)~~ (e) ## 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. KAB036

L03

~~(b)~~ (f) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel. A06 KAB036

Add Note (d)

(d) A channel consists of two valve position indicators associated with the in-series valves in a single suction line. KAB037 A05

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 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

A06

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

Table 3.3-(e) Footnote ~~(a)~~ KAB036

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)~~ (e) ACTION B KAB036

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~~.

ACTION C ### b. With the accident monitoring indication for two ~~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. A06

Table 3.3.3-1 Footnote ~~(a)~~ (e) ACTION H KAB036

Table 3.3.3-1 Footnote ~~(b)~~ (f) ### ~~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 KAB036 LA06

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ITS | A01 | ITS 3.3.3

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

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INSTRUMENTATION

FIRE DETECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 This Specification is deleted.

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TABLE 3.3-11
FIRE DETECTION INSTRUMENTS

This Table is deleted.
(Pages 3/4 3-60 through 3/4 3-67a)

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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.

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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.

and is modified by Footnote (a). Footnote (a) states, "A channel consists of three valve position indicators (two level control valves for the motor driven AFW flow path and one level control valve for the turbine driven AFW flow path)."

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.

KAB036

and explicitly stating the number of valve position indicators 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 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

DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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. KAB036

b

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. KAB036

b

and is modified by Footnote (d). Footnote (d) states, "A channel consists of two valve position indicators associated with the in-series valves in a single suction line."

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. KAB037 KAB037 KAB037

and is modified by Footnote (d). Footnote (d) states, "A channel consists of two valve position indicators associated with the in-series valves in a single suction line."

and explicitly stating the number of valve position indicators included in a channel

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

DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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)~~ (f) 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

KAB036

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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 KAB036 ~~(b)~~ (f) 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 KAB036 entered. ITS Table 3.3.3-1 Footnote ~~(b)~~ (f) 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

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ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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

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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

DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

(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

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DISCUSSION OF CHANGES
ITS 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

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. KAB035

SR

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.

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

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

3.3.3.7 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

CTS

ITS 3.3.3

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

ITS Insert Page 3.3.3-1

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 G 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~~.1 and G referenced in Table 3.3.3-1.	I ~~F~~.1 Initiate action in accordance with Specification 5.6.5.	Immediately	1

These SRs

SURVEILLANCE REQUIREMENTS

--NOTE--

4.3.3.7 ~~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 S ------------------------------NOTE------------------------------ 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

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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.

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CTS

PAM Instrumentation
3.3.3 KAB036

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. 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)~~ e 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. KAB036

Note ###

~~(b)~~ f Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

DOC A03

~~(c)~~ b 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)~~ c Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint. 1

(a) A channel consists of three valve position indicators (two level control valves for the motor driven AFW flow path and one level control valve for the turbine driven AFW flow path). XX 1

CTS

ITS 3.3.3 KAB036

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 (a)	H KAB036

CTS

ITS 3.3.3

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)~~ (b)	H	KAB036
		b. Core Quadrant (2)	2~~(c)~~ (b)	H	KAB036
		c. Core Quadrant (3)	2~~(c)~~ (b)	H	KAB036
		d. Core Quadrant (4)	2~~(c)~~ (b)	H	KAB036
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)~~ (c)	H	KAB036
		b. Intermediate Range	2	H	
18	18.	ERCW to AFW Valve Position			
		a. Motor Driven Pumps	2 (d)	H	KAB037
		b. Turbine Driven Pump	2 (d)	H	KAB037
19	19.	Containment Isolation Valve Position	2 per penetration flowpath~~(a)(b)~~ (e)(f)	H	KAB036

(d) A channel consists of two valve position indicators associated with the in-series valves in a single suction line. KAB037

ITS Insert Page 3.3.3-4b

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. INSERT 2	C.1 Restore one channel to OPERABLE status.	7 days	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

CTS

ITS 3.3.3

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.	72 hours
		<u>AND</u>		
		F.2	Restore the inoperable channel(s) to OPERABLE status.	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 1 12 hours 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

These SRs

SURVEILLANCE REQUIREMENTS

-----NOTE-----
4.3.3.7 ~~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 --- Perform CHANNEL CALIBRATION.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

1
1
2

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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.

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CTS

PAM Instrumentation
3.3.3

KAB036

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~~.1 G
~~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)~~ e 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.

KAB036

Note ###

~~(b)~~ f Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

DOC A03

~~(c)~~ b 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)~~ c Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint. 1

(a) A channel consists of three valve position indicators (two level control valves for the motor driven AFW flow path and one level control valve for the turbine driven AFW flow path). XX 1

CTS

ITS 3.3.3 KAB036

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 (a)	H	KAB036

ITS Insert Page 3.3.3-4a

CTS | ITS 3.3.3

Table 3.3-10

1

INSERT 4 continued

	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)~~ (b)	H	KAB036
	b. Core Quadrant (2)	2~~(c)~~ (b)	H	KAB036
	c. Core Quadrant (3)	2~~(c)~~ (b)	H	KAB036
	d. Core Quadrant (4)	2~~(c)~~ (b)	H	KAB036
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)~~ (c)	H	KAB036
	b. Intermediate Range	2	H	
18	18. ERCW to AFW Valve Position			
	a. Motor Driven Pumps	2 (d)	H	KAB037
	b. Turbine Driven Pump	2 (d)	H	KAB037
19	19. Containment Isolation Valve Position	2 per penetration flowpath~~(a)(b)~~ (e)(f)	H	KAB036

(d) A channel consists of two valve position indicators associated with the in-series valves in a single suction line. KAB037

ITS Insert Page 3.3.3-4b

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

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 ~~I~~ 1, non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category ~~I~~ 1, non-Type A, variables are important for reducing public risk. 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 ~~I~~ 1, 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 ~~1~~ 2. 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.~~ 1

~~Neutron flux is used for accident diagnosis, verification of subcriticality, and diagnosis of positive reactivity insertion.~~

1, 2. ~~3, 4.~~ Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) ~~System (RCS) Hot and Cold Leg Temperatures~~

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) ~~RCS Hot and Cold Leg Temperatures~~ are Category ~~I~~ 1 variables provided for verification of core cooling and long term surveillance. 2

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} ~~RCS hot and cold leg~~ temperatures are used to determine reactor coolant ~~RCS~~ subcooling margin. Reactor coolant ~~RCS~~ subcooling margin will allow termination of safety injection (SI), if still in progress, or reinitiation of SI if it has been stopped. Reactor coolant ~~RCS~~ 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~~ 0°F to 700°F.

INSERT 1

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~~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

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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

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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.

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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.

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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.

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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,~~

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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.~~

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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.~~

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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~~

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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

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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.

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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

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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.

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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~~. 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 to 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. 1

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 method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." INSERT 4 Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Incore ~~Core Exit~~ thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. ~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~ 5 1 5 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.

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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)~~. ~~]~~ SQN-EEB-PS-PAM-0001, PAM Variable QA Data - Base

2. Regulatory Guide 1.97, ~~[date]~~ Revision 2, December 1980.

3. NUREG-0737, Supplement 1, "TMI Action Items."

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 to determine if a gross breach of a barrier has occurred. ~~, and~~ 1

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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 ~~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

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 ~~I~~, non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. 1 Therefore, Category ~~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 1 Regulatory Guide 1.97 instruments that have been designated Category ~~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 ~~1~~ 2. 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~~ 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 T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) ~~System (RCS) Hot and Cold Leg Temperatures~~

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} (Wide Range) ~~RCS Hot and Cold Leg Temperatures~~ are Category 1 ~~I~~ variables provided for verification of core cooling and long term surveillance. 2

Reactor Coolant T_{HOT} and Reactor Coolant T_{COLD} ~~RCS hot and cold leg~~ temperatures are used to determine reactor coolant ~~RCS~~ subcooling margin. Reactor coolant ~~RCS~~ subcooling margin will allow termination of safety injection (SI), if still in progress, or reinitiation of SI if it has been stopped. Reactor coolant ~~RCS~~ 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 ~~3~~0~~2~~°F to 700°F.

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:~~

- ~~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

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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.

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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.

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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.

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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

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.~~

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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.~~

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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

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

Condition A applies when one or more Functions have one required channel that is inoperable. A Note is added stating that this ACTION is not applicable to Function 16, which has its own ACTION for one channel 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. INSERT 2 5

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.

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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

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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~~. 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. 1

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 method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Trip System (RTS) Instrumentation." INSERT 4 Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Incore ~~Core Exit~~ thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element. ~~[The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle.~~ 5 1 5 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)

~~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

REFERENCES

~~[~~ 1. SQN-EEB-PS-PAM-0001, PAM Variable QA Data - Base ~~Unit specific document (e.g., FSAR, NRC Regulatory Guide 1.97 SER letter)~~. ~~]~~ 1

2. Regulatory Guide 1.97, Revision 2, December 1980 ~~[date]~~.

3. NUREG-0737, Supplement 1, "TMI Action Items."

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."

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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.

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ATTACHMENT 4

ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

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

ITS A01 ITS 3.3.4

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

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 for each required instrumentation channel that is normally energized and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-6.

L02

Add proposed SR 3.3.4.2 Note 1 L03

ITS A01 ITS 3.3.4

~~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

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ITS A01 ITS 3.3.4

~~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~~

~~NOTE 1: Auxiliary Control Room Panel 1-L-10~~

~~NOTE 2: Auxiliary Control Room Panels 1-L-11A and 1-L-11B~~

LA01

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ITS
A01
ITS 3.3.4

~~TABLE 4.3-6~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~
~~SURVEILLANCE REQUIREMENTS~~

LA01

~~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~~ (SR 3.3.4.2 Note 2)	~~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

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CHLORINE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

This specification deleted.

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ITS A01 ITS 3.3.4

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 for each required instrumentation channel that is normally energized and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-6. L02

Add proposed SR 3.3.4.2 Note 1. L03

ITS A01 ITS 3.3.4

~~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

ITS A01 ITS 3.3.4

~~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~~

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ITS

A01

ITS 3.3.4

~~TABLE 4.3-6~~

~~REMOTE SHUTDOWN MONITORING INSTRUMENTATION~~
~~SURVEILLANCE REQUIREMENTS~~

LA01

~~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~~

SR 3.3.4.2 Note 2

In accordance with the Surveillance Frequency Control Program

LA02

ITS A01 ITS 3.3.4

INSTRUMENTATION

CHLORINE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

This specification deleted.

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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.

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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

DISCUSSION OF CHANGES
ITS 3.3.4, REMOTE SHUTDOWN MONITORING INSTRUMENTATION

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 Monitoring Instrumentation ~~System~~ 1

3.3.3.5 LCO 3.3.4 The Remote Shutdown Monitoring Instrumentation ~~System~~ 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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	2 3 2 3

Monitoring Instrumentation

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	S -------------------------------NOTE------------------------------- 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

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3.3 INSTRUMENTATION

Monitoring Instrumentation

3.3.4 Remote Shutdown ~~System~~ 1

Monitoring Instrumentation

3.3.3.5 LCO 3.3.4 The Remote Shutdown ~~System~~ 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~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	2 3 2 3

1

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]~~
SR 3.3.4.~~3~~ 2	S ----------------------------NOTE---------------------------- 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 ~~]~~
~~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]]~~

DOC L03

4.3.3.5, Table 4.3-6,

5

5

6

3

3

7

4

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.

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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 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 ~~dump~~ relief valves (~~ADVs~~ ARVs) can be used to remove core decay heat and meet all safety requirements. The long term supply of water for the AFW System and the ability to borate the Reactor Coolant System (RCS) from outside the control room allows extended operation in MODE 3. 1 2

If the control room becomes inaccessible, the operators can ~~establish control~~ monitor the status of the reactor at the locations shown on Table B 3.3.4-1 ~~remote shutdown panel, and place and maintain the unit in MODE 3~~. ~~Not all controls and necessary transfer switches are located at the remote shutdown panel. Some controls and transfer switches will have to be operated locally at the switchgear, motor control panels, or other local stations.~~ The unit automatically reaches MODE 3 following a unit shutdown and can be maintained safely in MODE 3 for an extended period of time. 2

The OPERABILITY of the remote shutdown ~~control and~~ monitoring instrumentation 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 room become inaccessible. 2 2

APPLICABLE SAFETY ANALYSES

The Remote Shutdown ~~System~~ Monitoring Instrumentation is required to provide equipment at 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. 1 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, GDC 19 (Ref. 1). 1

The Remote Shutdown ~~System~~ Monitoring Instrumentation satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii). 1

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~~ monitoring instrumentation needed to support the Remote Shutdown ~~System~~ Function ~~are~~ is OPERABLE. ~~In some cases,~~ For Function 7, 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 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

Monitoring Instrumentation LCO is not met

any required

The ~~A~~ Remote Shutdown ~~System division is inoperable~~ when ~~each function is not accomplished by at least one designated Remote Shutdown System~~ 1

does not satisfy its

channel ~~that satisfies the~~ OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases.

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. Separate Condition entry is allowed for each Function. The Completion Time(s) of the inoperable channel(s)~~/train(s)~~ of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function. 2

A.1

Condition A addresses the situation where one or more required

Monitoring Instrumentation

Functions of ~~the~~ Remote Shutdown ~~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.~~ 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 3.3.4.2~~

~~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~~

~~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.~~ 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.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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.

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Table B 3.3.4-1 (page 1 of 1)
Remote Shutdown ~~System~~ Monitoring Instrumentation ~~and Controls~~ 1

INSERT 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]~~ 2
~~3. Decay Heat Removal via Steam Generators (SGs)~~	
~~a. RCS Hot Leg Temperature~~	~~[1 per loop]~~
~~b. RCS Cold Leg Temperature~~	~~[1 per loop]~~
~~c. AFW Controls Condensate Storage Tank Level~~	~~[1]~~
~~d. SG Pressure~~	~~[1 per SG]~~
~~4. RCS Inventory Control~~	
~~a. Pressurizer Level~~	~~[1]~~
~~b. Charging Pump Controls~~	~~[1]~~

~~REVIEWER'S NOTE~~
~~For channels that fulfill GDC 19 requirements, the number of OPERABLE channels required depends upon the unit licensing basis as described in the NRC unit specific Safety Evaluation Report (SER). Generally, two divisions are required OPERABLE. However, only one channel per a given Function is required if the unit has justified such a design, and NRC's SER accepted the justification.~~ 6

~~REVIEWER'S NOTE~~
~~This Table is for illustration purposes only. It does not attempt to encompass every Function used at every unit, but does contain the types of Functions commonly found.~~ 6

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

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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 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 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. 1 2

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 unit shutdown and can be maintained safely in MODE 3 for an extended period of time. 2

The OPERABILITY of the remote shutdown ~~control and~~ monitoring instrumentation 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 room become inaccessible. 2 2

APPLICABLE SAFETY ANALYSES

The Remote Shutdown ~~System~~ Monitoring Instrumentation is required to provide equipment at 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. 1 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, GDC 19 (Ref. 1). 1

The Remote Shutdown ~~System~~ Monitoring Instrumentation satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii). 1

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~~ monitoring instrumentation needed to support the Remote Shutdown ~~System~~ 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 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.

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.~~ 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 3.3.4.2~~

~~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~~

~~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.~~
~~--]~~

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.

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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.~~

4

~~OR~~

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

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

REFERENCES 1. 10 CFR 50, Appendix A, GDC 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)

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 / 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.”

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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

	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		In accordance with the Surveillance Frequency Control Program		LA01
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		In accordance with the Surveillance Frequency Control Program		LA01
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.”

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ITS ITS 3.3.5

A01

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 or enter
ACTION C 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 or enter applicable Limiting
ACTION C 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

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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	~~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."

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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 –

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DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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

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DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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.

<u>LESS RESTRICTIVE CHANGES</u>

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

DISCUSSION OF CHANGES
ITS 3.3.5, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION

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

3.3.5~~A~~ Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation ~~(Without Setpoint Control Program)~~ (1)

3.3.3.11

LCO 3.3.5~~A~~ The LOP DG start instrumentation for each Function in Table 3.3.5-1 ~~[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

APPLICABILITY: According to Table 3.3.5-1. ~~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]]~~
SR 3.3.5.~~2~~ 1	INSERT 4 Perform TADOT.	~~[[31] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
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 ~~]~~

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.

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CTS

3.3.5

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."

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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 LCO 3.3.5~~A~~ The LOP DG start instrumentation for each Function in Table 3.3.5-1 ~~[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 APPLICABILITY: According to Table 3.3.5-1. ~~MODES 1, 2, 3, and 4, When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources - Shutdown."~~ 2

ACTIONS

---NOTE---

ACTION c 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

CTS 3.3.5

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~~ 2 4 5 ~~OR~~ 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~~ 5 ~~OR~~ 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.

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CTS

3.3.5

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."

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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.

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

1

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

INSERT 1 ~~Three undervoltage relays with inverse time characteristics are provided on each 4160 Class 1E instrument bus for detecting a sustained degraded voltage condition or a loss of bus voltage. The relays are combined in a two-out-of-three logic to generate 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.

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BASES

BACKGROUND (continued)

The Trip Setpoints used in the relays are based on the analytical limits presented in the associated setpoint scaling document ~~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

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 Table 3.3.5-1 ~~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 calculations (Refs. 2, 3, and 4 ~~3~~). 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 5 ~~2~~, 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.

BASES

ACTIONS (continued)

Because the required channels are specified on a per ~~bus~~ shutdown board basis, the Condition may be entered separately for each ~~bus~~ shutdown board as appropriate. 4

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed 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

Condition A applies to the LOP DG start Functions with one ~~loss of voltage or one degraded voltage~~ or more Functions with one voltage sensor channel ~~per bus~~ inoperable. 4

If one channel of the voltage sensors is inoperable, Required Action A.1 requires that channel to be ~~placed in trip~~ restored to OPERABLE status 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.~~

The specified Completion Time ~~and time allowed for bypassing one channel are~~ is reasonable considering the Function remains fully OPERABLE ~~on every bus~~ and the low probability of an event occurring during these intervals. 4

B.1

Condition B applies when ~~more than one loss of voltage~~ one or more Functions have two or more voltage sensor channels inoperable or ~~more than one degraded voltage channel per bus are~~ one or more Functions have one required timer inoperable. 4

Required Action B.1.1 requires restoring all but one voltage sensor channel ~~per bus~~ to OPERABLE status. Required Action B.1.2 requires restoring the required load shed timer 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

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1

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

1

SR 3.3.5.~~2~~

1

SR 3.3.5.~~2~~ is the performance of a TADOT. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. 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~~

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

6

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

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BASES

SURVEILLANCE REQUIREMENTS (continued)

2

SR 3.3.5.~~3~~

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.~~

~~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 6 3

REFERENCES

1. FSAR, Section ~~[~~8.3~~]~~.
U 5 ~~2.~~ FSAR, Chapter ~~[~~15~~]~~.
2 ~~3~~. ~~Plant specific setpoint methodology study~~. INSERT 3

5 2 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."

1

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 bus~~ Shutdown Board. 2

INSERT 1

~~Three undervoltage relays with inverse time characteristics are provided on each 4160 Class 1E instrument bus for detecting a sustained degraded voltage condition or a loss of bus voltage.~~ ~~The relays are combined in a two-out-of-three logic to generate 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.

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 associated setpoint scaling document

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

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.

Table 3.3.5-1

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

s 2, 3, and 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.

BASES

ACTIONS (continued)

Because the required channels are specified on a per ~~bus~~ shutdown board basis, the Condition may be entered separately for each ~~bus~~ shutdown board as appropriate. 4

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed 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

Condition A applies to the LOP DG start Functions with one ~~loss of voltage or one degraded voltage~~ or more Functions with one voltage sensor channel ~~per bus~~ inoperable. 4

If one channel of the voltage sensors is inoperable, Required Action A.1 requires that channel to be ~~placed in trip~~ restored to OPERABLE status 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.~~

The specified Completion Time ~~and time allowed for bypassing one channel are~~ is reasonable considering the Function remains fully OPERABLE ~~on every bus~~ and the low probability of an event occurring during these intervals. 4

B.1

Condition B applies when ~~more than one~~ one or more Functions have two or more voltage sensor channels inoperable ~~loss of voltage~~ or ~~more than one degraded voltage channel per bus are~~ one or more Functions have one required timer inoperable. 4

Required Action B.1.1 requires restoring all but one voltage sensor channel ~~per bus~~ to OPERABLE status. Required Action B.1.2 requires restoring the required load shed timer 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

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.~~ 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. 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.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

2

SR 3.3.5.~~3~~

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.

4

~~[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.~~

~~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

REFERENCES

1. U FSAR, Section ~~[~~8.3~~]~~.
5 ~~2.~~ U FSAR, Chapter ~~[~~15~~]~~. 5 2
2 ~~3~~. ~~Plant specific setpoint methodology study~~ INSERT 3. 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."

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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.

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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.

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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

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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

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ITS

A01

ITS 3.3.6

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~~	

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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~~
Function 3 — 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	$\leq$ 2.9 psig
d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	$\geq$ 592.2 psig steam line pressure (Note 1)
e. Negative Steam Line Pressure Rate—High	100.0 psi (Note 2)	$\leq$ 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	$\leq$ 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

KAB043

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

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 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

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ITS A01 ITS 3.3.6

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~~ 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

Containment Ventilation Isolation A02

~~RADIATION MONITORING~~ INSTRUMENTATION

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	2 ~~1~~ (A08)	1, 2, 3, 4 ~~& 6~~ During movement of ~~recently~~ irradiated fuel assemblies within containment (L04)	≤ 8.5x 10^{-3} µCi/cc	~~10 - 10^{7} cpm~~ (LA03)	28
b. Containment					
i. Deleted					
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27 (See ITS 3.4.15)
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)

MHC003

* 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

ITS A01 ITS 3.3.6

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

MHC003

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

ITS | A01 | ITS 3.3.6

Table 3.3.6-1

TABLE 4.3-3

Containment Ventilation Isolation

~~RADIATION MONITORING INSTRUMENTATION~~ SURVEILLANCE REQUIREMENTS (A02)

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 (Function 3)	~~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

MHC003

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)

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.

MHC003

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

~~SR 3.3.6.2~~, SR 3.3.4
SR 3.3.6.3
SR 3.3.6.5
SR 3.3.6.6
KAB045

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.

~~L06~~

See ITS 3.9.4

STET KAB045

~~recently~~ ~~L04~~

MHC003

ITS A01 ITS 3.3.6

INSTRUMENTATION

3/4.3.2 ~~ENGINEERED SAFETY FEATURE ACTUATION SYSTEM~~ Containment Ventilation Isolation INSTRUMENTATION A02

LIMITING CONDITION FOR OPERATION

LCO 3.3.6 3.3.2 ~~The Engineered Safety Feature Actuation System (ESFAS)~~ Containment Ventilation Isolation 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~~. A02 A03

Applicability APPLICABILITY: As shown in Table 3.3-3.

ACTION:

ACTION A a. With an ~~ESFAS~~ Containment Ventilation Isolation 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~~. A02 A03

ACTION A b. With an ~~ESFAS~~ Containment Ventilation Isolation instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3. A02

SURVEILLANCE REQUIREMENTS

SR Note 4.3.2.1.1 Each ~~ESFAS~~ Containment Ventilation Isolation instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ ACTUATION LOGIC TEST / COT / TADOT operations for the MODES and at the frequencies shown in Table 4.3-2. A02 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

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~~. A04

~~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

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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

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ITS A01 ITS 3.3.6

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

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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. 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~~	

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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

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.

Function 3

A03

See ITS 3.3.2

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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

~~92 days on a STAGGERED TEST BASIS~~ L03

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

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INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

~~RADIATION MONITORING~~ Containment Ventilation Isolation INSTRUMENTATION A02

LIMITING CONDITION FOR OPERATION

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~~. A02 A03

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~~. M05

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. A02

~~c. The provisions of Specification 3.0.3 are not applicable.~~ M06

SURVEILLANCE REQUIREMENTS

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. A02 M01

ITS A01 ITS 3.3.6

Table 3.3.6-1

TABLE 3.3-6
~~RADIATION MONITORING~~ INSTRUMENTATION
Containment Ventilation Isolation A02

A03

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	2 ~~1~~	1, 2, 3, 4 ~~& 6~~ During movement of ~~recently~~ irradiated fuel assemblies within containment	≤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

LA03 See ITS 3.3.8

Function 3
MHC003
A08 LA03 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

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ITS

A01

ITS 3.3.6

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

MHC003

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

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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~~	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 MHC003

During movement of ~~recently~~ irradiated fuel assemblies within containment L04

Function 3

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.

MHC003

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
SR 3.3.6.3
SR 3.3.6.5
SR 3.3.6.6

KAB045

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

STET KAB045

~~recently~~ ~~L04~~

MHC003

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

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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

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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~~ ESFAS 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. KAB040

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)~~ 3.c.1 (Containment Isolation, Containment Ventilation Isolation, 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. KAB043

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.

Insert 1 MHC003

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

INSERT 1

MHC003

A08 CTS Table 3.3-6 specifies, in part, that Instrument 2.a (Process Monitors, Containment Purge Air) requires one channel OPERABLE during Modes 1, 2, 3, 4, and 6 (See DOC L04 regarding the relaxation in the Mode of Applicability for CTS Table 3.3-6, Instrument 2.a, Process Monitors, Containment Purge Air, from Mode 6 to during the movement of irradiated fuel assemblies within the containment). CTS 3.9.9 requires the Containment Ventilation Isolation System to be OPERABLE during the movement of irradiated fuel within the containment. An OPERABLE Containment Ventilation Isolation System requires two OPERABLE channels. ITS 3.3.6 combines requirements from CTS Table 3.3-6 and CTS 3.9.9 to form a single Specification, Containment Ventilation Isolation Instrumentation. ITS Table 3.3.6-1 requires Function 3 (Containment Purge Air Radiation Monitor) to have two channels OPERABLE during the movement of irradiated fuel assemblies within containment. This changes the CTS by having a single Specification for the Containment Ventilation Isolation Instrumentation function in lieu of including it in the Radiation Monitoring Instrumentation and Containment Ventilation Isolation System Specifications.

This change is acceptable because the technical requirements for the Radiation Monitoring Instrumentation and Containment Ventilation Isolation System are maintained with the change in format. The Containment Ventilation Isolation Instrumentation continues to require the OPERABILITY of Radiation Monitoring Instrumentation and the Containment Ventilation Isolation System. This change is designated as administrative because it does not result in a technical change to the CTS.

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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

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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

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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.) MHC003

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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

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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~~ detector from the ESF RESPONSE TIME testing for the Containment Ventilation Isolation High Radiation Function. KAB042

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

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ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

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

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DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

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. MHC003

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. MHC003

DISCUSSION OF CHANGES
ITS 3.3.6, CONTAINMENT VENTILATION ISOLATION INSTRUMENTATION

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.

KAB045 Not Used

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.~~

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

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ 3.3.6~~A~~ 1

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

---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~~
~~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

2

3.3.2.1 ACTION a, ACTION b; Table 3.3-3 ACTION 15, ACTION 19; Table 3.3-6 ACTION 28

2

2

2

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CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ 3.3.6~~A~~ (1)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Table 3.3-6 ACTION 28, 3.9.9 ACTION MHC003 ~~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)~~ 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~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 4 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

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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 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~~ In accordance with the Surveillance Frequency Control Program ~~]~~	4 4

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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 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. (3) (5)	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ (4) In accordance with the Surveillance Frequency Control Program ~~]]~~ (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. MHC003	Within 100 hours prior to start of movement of ~~recently~~ irradiated fuel AND ~~[92 days~~ KAB045 (5) (2) ~~OR~~ (4) In accordance with the Surveillance Frequency Control Program ~~]~~ (4)

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~ 3.3.6~~A~~ 1

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.	MHC003 Within 100 hours prior to start of movement of ~~recently~~ irradiated fuel AND KAB045 ~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5 2 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 4.9.9 Insert 3	2. Automatic Actuation ~~Logic and Actuation Relays~~	~~1,2,3,4, (a)~~	~~2 trains~~	~~SR 3.3.6.2~~ ~~SR 3.3.6.3~~ ~~2~~ ~~[SR 3.3.6.4]~~ 3 ~~[SR 3.3.6.5]~~ ~~5~~ ~~SR 3.3.6.7~~	NA KAB045	5 7
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					3
INSERT 2	~~a. Gaseous~~	1,2,3,4~~, (a)~~	~~[~~1~~]~~	SR 3.3.6.1 4 SR 3.3.6.~~6~~ 7 SR 3.3.6.~~9~~ SR 3.3.6.8	≤ ~~[2 x background]~~ 8.5 x 10^{-3} μCi/cc	5
	~~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

MHC003 (a) During movement of ~~[recently]~~ irradiated fuel assemblies within containment. 3

ITS 3.3.6

3 **INSERT 2**

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
	(a)	~~1~~ 2	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	≤ 8.5 x 10^{-3} μCi/cc

KAB045

7 **INSERT 3**

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
a. Logic	1,2,3,4	2 trains	SR 3.3.6.2	NA
b. Relays	1,2,3,4, (a)	2 trains	SR 3.3.6.3 SR 3.3.6.5	NA

Insert Page 3.3.6-7

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
3.3.3.1
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, 3.3.3.1 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.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One radiation monitoring channel inoperable.~~	~~A.1 Restore the affected channel to OPERABLE status.~~	~~4 hours~~
~~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

2 (Condition A row)

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)

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. 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 Immediately

Table 3.3-6 ACTION 28, 3.9.9 ACTION

MHC003

2 3 2 2 2

CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ 1

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
SR 3.3.6.1	Perform CHANNEL CHECK.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~
~~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]~~
~~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]~~

Table 4.3-2 Function 3.c.3, Table 4.3-3 Instrument 2.a

4

4

5

5

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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 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 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]~~ 4 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 4

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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. MHC003 Within 100 hours prior to start of movement of ~~recently~~ irradiated fuel AND	~~[92 days~~ KAB045 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5 2 4 4

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CTS

Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation ~~(Without Setpoint Control Program)~~
3.3.6~~A~~ 1

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.	MHC003 Within 100 hours prior to start of movement of ~~recently~~ irradiated fuel AND KAB045 ~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5 2 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~~

Table 3.3.6-1 (page 1 of 1)
Containment ~~Purge and Exhaust~~ Ventilation Isolation Instrumentation

CTS	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
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
4.9.9	Insert 3				
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
	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.			

KAB045

MHC003 (a) During movement of ~~[recently]~~ irradiated fuel assemblies within containment.

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3 **INSERT 2**

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
	(a)	~~1~~ 2	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	≤ 8.5 x 10^{-3} μCi/cc

KAB045

7 **INSERT 3**

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
a. Logic	1, 2, 3, 4	2 trains	SR 3.3.6.2	NA
b. Relays	1, 2, 3, 4, (a)	2 trains	SR 3.3.6.3 SR 3.3.6.5	NA

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.

7. The Automatic Actuation Logic is required OPERABLE in MODES 1, 2, 3, and 4. The Automatic Actuation Relays are required OPERABLE in MODES 1, 2, 3, 4, and during movement of recently irradiated fuel within containment to ensure that the containment ventilation isolates when a high radiation signal is received from the containment purge air radiation monitors. Therefore, ISTS Table 3.3.6-1, Function 2 (Automatic Actuation Logic and Actuation Relays) has been divided into two sub-functions (a. Logic and b. Relays) to align with the required Applicable MODES. The Surveillance Requirements applicable to both sub-functions have been divided to align with the change. KAB045

The ACTUATION LOGIC TEST (ITS SR 3.3.6.2) is applicable to ITS Table 3.3.6-1 Function 2.a (Logic) in MODES 1, 2, 3, and 4. The MASTER RELAY TEST (ITS SR 3.3.6.3) and SLAVE RELAY TEST (ITS SR 3.3.6.5) are applicable to ITS Table 3.3.6-1 Function 2.b (Relays) in MODES 1, 2, 3, 4, and during movement of recently irradiated fuel within containment.

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 ~~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 MHC003 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.

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1

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

Table 3.3.6-1 specifies the number of required channels

~~The LCO specifies four required channels~~ one of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment ~~Purge~~ Ventilation Isolation remains OPERABLE. 2 KAB045 2

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY ~~may~~ also require~~s~~ 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. 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 as annotated on Table 3.3.6-1. ~~in MODES 1, 2, 3, and 4, and during movement of [recently] irradiated fuel assemblies [(i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] within containment.~~ ~~100 hours~~ 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 KAB045 3 KAB045 1

~~INSERT 2~~ 4 KAB045

~~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.~~ KAB045

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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)

It also addresses the failure of the required radiation monitoring channel.

~~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 KAB045 4

the required channel is

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. KAB045 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 the ~~single~~ required ~~multiple~~ 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 KAB045 4 1

MHC003 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~~

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 3.3.6.2~~

~~SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. [This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.~~ 4

~~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 3.3.6.3~~

~~SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. [This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.~~ 4

~~OR~~

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~[~~ SR 3.3.6.~~4~~ 2

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~~

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.~~
~~---~~ ~~]~~

The SR is modified by a Note stating that the Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. ~~]~~

~~[~~ SR 3.3.6.~~5~~ 3

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

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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~~ ESFAS Instrumentation. ~~]~~ 3 MHC003

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.~~ 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.

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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 ~~act as backup~~ , in addition 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 MHC003 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.

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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

Table 3.3.6-1 specifies the number of required channels

KAB045

~~The LCO specifies four required channels~~ ~~one~~ 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 require~~s~~ 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) 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 as annotated on Table 3.3.6-1. ~~in MODES 1, 2, 3, and 4, and during movement of [recently] irradiated fuel assemblies [(i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] within containment.~~ ~~100 hours~~ 4 KAB045 3

Under these conditions, the potential exists for an accident that could release significant fission product radioactivity into containment. Therefore, the containment ~~purge and exhaust~~ Ventilation isolation instrumentation must be OPERABLE in these MODES. 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.~~ KAB045

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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~~. It also addresses the failure of the required radiation monitoring channel. 4 1 KAB045 4

If a train is inoperable~~,~~ or ~~multiple channels are~~ the required 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 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 the ~~single~~ required ~~multiple~~ 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 KAB045 4 1

MHC003 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

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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-----------------------------------~~
~~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.~~
~~---]~~

~~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.~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

[SR 3.3.6.~~4~~ 2

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~~

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.~~
~~-----~~]

The SR is modified by a Note stating that the Surveillance is only applicable to the actuation logic of the ESFAS Instrumentation. ~~]~~

[SR 3.3.6.~~5~~ 3

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~~ ESFAS Instrumentation. ~~]~~ 3

MHC003

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

 1

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

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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-----------------------------------~~ 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.~~
~~--]~~

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.

UFSAR Table 7.3.1-4

2. ~~WCAP-15376, Rev. 0, October 2000.~~ 2

WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995

3. ~~NUREG-1366, [date].~~ 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.

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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.

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ATTACHMENT 7

ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

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

ITS A01 ITS 3.3.7

3/4.3.3 MONITORING INSTRUMENTATION

~~RADIATION MONITORING~~ CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION INSTRUMENTATION A02

LIMITING CONDITION FOR OPERATION

LCO 3.3.7 3.3.3.1 The ~~radiation monitoring~~ CREVS actuation instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits. A02

Applicability APPLICABILITY: As shown in Table 3.3-6.

ACTION: Add proposed ACTIONS Note A03

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 A, ACTION B, ACTION C, ACTION D, ACTION E b. With one or more ~~radiation monitoring~~ CREVS actuation instrumentation channels inoperable, take the ACTION shown in Table 3.3-6. A02

c. ~~The provisions of Specification 3.0.3 are not applicable.~~ M02

SURVEILLANCE REQUIREMENTS

SR Table Note 4.3.3.1 Each ~~radiation monitoring~~ CREVS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and ~~CHANNEL FUNCTIONAL TEST~~ CHANNEL OPERATIONAL TEST (COT) operations for the MODES and at the frequencies shown in Table 4.3-3. A02 M03

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ITS

A01

ITS 3.3.7

Table 3.3.7-1

TABLE 3.3-6

CONTROL ROOM EMERGENCY VENTILATION (CREVS) ACTUATION

~~RADIATION MONITORING~~ INSTRUMENTATION

A02

LA01

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	≤ 8.5x 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
Function 3 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

See ITS 3.3.6

See ITS 3.4.15

LA01

MHC003

and during CORE ALTERATIONS A04

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.

December 04, 2008
Amendment Nos. 12, 60, 112, 168, 256, 310, 322

ITS A01 ITS 3.3.7

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~~ Immediately 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. 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~~

MHC003 Stet

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

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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
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

See ITS 3.3.8

See ITS 3.3.6

See ITS 3.4.15

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

ITS A01 ITS 3.3.7

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

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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~~ LA01	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						
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						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 and during CORE ALTERATIONS A04	≤ 400 cpm**	~~10 - 10^{7} cpm~~ LA01	29	

MHC003

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.

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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~~ Immediately 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. 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~~

MHC003

Stet

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 IS REQUIRED	
1. AREA MONITOR					
a. Fuel Storage Pool Area	S	R	Q	*	See ITS 3.3.8
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

* 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.

Insert 1 → MHC003

INSERT 1

A04 CTS 3.3.3.1 requires, in part, the Radiation Monitoring Instrumentation shown in Table 3.3-6 to be OPERABLE during Applicable Modes. CTS Table 3.3-6, Instrument 2.c, Process Monitors, Control Room Isolation, is required OPERABLE during ALL MODES and during the movement of irradiated fuel assemblies. ITS LCO 3.3.7 requires, in part, MHC003 that the Control Room Emergency Ventilation System actuation instrumentation for each Function in Table 3.3.7-1 be OPERABLE during Applicable Modes or Other Specified Conditions. ITS Table 3.3.7-1, Function 3.a, Control Room Radiation, Control Room Air Intakes, is required OPERABLE in Modes 1, 2, 3, 4, 5, 6, and (a), where Footnote (a) states, "During movement of irradiated fuel assemblies, During CORE ALTERATIONS." This changes the CTS by specifying the Process Monitors, Control Room Isolation Instrumentation is required OPERABLE during CORE ALTERATIONS.

This change is acceptable because CORE ALTERATIONS can only be performed in MODE 6. CTS 3.3.3.1 requires the Process Monitors, Control Room Isolation, to be OPERABLE in MODE 6. 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

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

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

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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

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

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.

CORE ALTERATIONS and suspend

MHC003

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.

CORE ALTERATIONS and during

MHC003

CORE ALTERATIONS and suspending

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

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DISCUSSION OF CHANGES
ITS 3.3.7, CONTROL ROOM EMERGENCY VENTILATION SYSTEM (CREVS) ACTUATION INSTRUMENTATION

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.

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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.

MHC003

Not Used

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)

CTS

CRE~~F~~ V S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.7~~A~~

3.3 INSTRUMENTATION

3.3.7~~A~~ Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~ V S) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ 1

3.3.3.1 LCO 3.3.7 The CRE~~F~~ V S 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

---NOTE---

DOC A03 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~~ V S 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~~ V S train in ~~emergency [radiation protection]~~ recirculation mode. AND	Immediately 1 3 2

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CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.7~~A~~

V

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~~S train made inoperable by inoperable CRE~~F~~S actuation instrumentation. (V) (V)	Immediately	1 1
		OR		
		B.2 Place both trains in ~~emergency [radiation protection]~~ recirculation mode.	Immediately	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.	6 hours	
		AND		
		C.2 Be in MODE 5.	36 hours	
DOC M07, Table 3.3-6 ACTION 29b MHC003	D. Required Action and associated Completion Time for Condition A or B not met during movement of ~~[recently]~~ irradiated fuel assemblies, or during CORE ALTERATIONS.	D.1 Suspend movement of ~~[recently]~~ irradiated fuel assemblies. AND D.2 Suspend CORE ALTERATIONS	Immediately Immediately	2 7 2 7
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
3.3.7~~A~~

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

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

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CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ 1
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V

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. 5	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 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

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3.3.7~~A~~ 1

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 ~~]~~
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 5 4 4

CTS

CRE~~F~~S Actuation Instrumentation ~~(Without Setpoint Control Program)~~ V 1
3.3.7~~A~~

Table 3.3.7-1 (page 1 of 1)
CRE~~F~~S Actuation Instrumentation V 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	≤ ~~[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.				MHC003

Table 4.3-3 Instrument 2.c
DOC A04

(a) During movement of ~~[recently]~~ irradiated fuel assemblies, During CORE ALTERATIONS. 2 7

Table 3.3-6 Footnote **

(b) Equivalent to 1.0 x 10^{-5} μCi/cc. 3

3.3 INSTRUMENTATION

Ventilation V

3.3.7~~A~~ Control Room Emergency ~~Filtration~~ System (CRE~~F~~S) Actuation Instrumentation ~~(Without Setpoint Control Program)~~ 1

V

3.3.3.1 LCO 3.3.7 The CRE~~F~~S 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

---NOTE---

DOC A03 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.]~~ ~~---------------------------------~~ V Place one CRE~~F~~S train in recirculation ~~emergency [radiation protection]~~ 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	V Place one CRE~~F~~S train in recirculation ~~emergency [radiation protection]~~ mode. AND	 Immediately	2 1 3 2