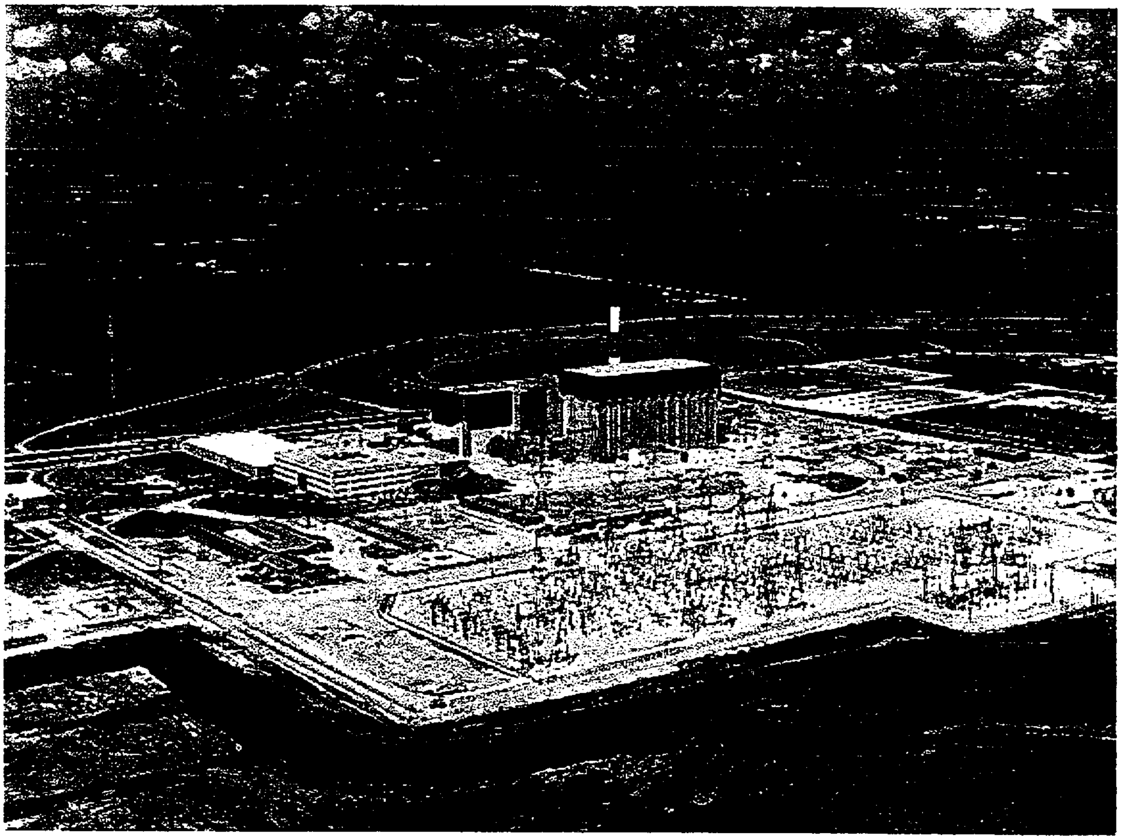
Improved Technical Specifications



LaSalle County Station

Volume 4:
Section 3.3; ISTS/JFDs,
ISTS Bases/JFDs, and NSHC

ComEd

<CTS>

3.3 INSTRUMENTATION

3.3.1.1 Reactor Protection System (RPS) Instrumentation

<LCO 3.3.1> LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

<APPL 3.3.1> APPLICABILITY: According to Table 3.3.1.1-1.

<Table 4.3.1.1-1 footnote (d)>

ACTIONS

2. When Function 2.b and 2.c channels are inoperable due to the APRM gain adjustment factor (GAF) not within limits, entry into associated Conditions and Required Actions may be delayed for up to 2 hours if the GAF is >1.02, and for up to 12 hours if the GAF is < 0.98.

NOTE S 7

<DOC A.2> 1 Separate Condition entry is allowed for each channel.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.1 Act a> <3.3.1 Act b> <3.3.1 Act b3>	A. One or more required channels inoperable.	A.1 Place channel in trip. OR A.2 Place associated trip system in trip.	12 hours 12 hours
<3.3.1 Act b> <3.3.1 Act b.2>	B. One or more Functions with one or more required channels inoperable in both trip systems.	B.1 Place channel in one trip system in trip. OR B.2 Place one trip system in trip.	6 hours 6 hours
<3.3.1 Act b> <3.3.1 Act b.1>	C. One or more Functions with RPS trip capability not maintained.	C.1 Restore RPS trip capability.	1 hour

(continued)

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
<3.3.1 Act c> <3.3.1 Act b, footnote(k)>	D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1	Enter the Condition referenced in Table 3.3.1.1-1 for the channel.	Immediately
<Table 3.3.1-1, Action 6>	E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	E.1	Reduce THERMAL POWER to < ~~[40]~~ 25 [1] % RTP.	4 hours
	~~F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.~~ [2]	~~F.1~~	~~Reduce THERMAL POWER to < 25% RTP.~~	~~4 hours~~
<Table 3.3.1-1, Action 4>	~~G~~ F [2]. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	~~G~~ F [2].1	Be in MODE 2.	6 hours
<Table 3.3.1-1, Action 1>	~~H~~ G [2]. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	~~H~~ G [2].1	Be in MODE 3.	12 hours
<Table 3.3.1-1, Action 3> <Table 3.3.1-1, Action 9>	~~I~~ H [2]. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	~~I~~ H [2].1	Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

TS⟩
⟨4.3.1.1⟩

------------------------------------NOTES------------------------------------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

⟨Table 3.3.1-1, footnote (a)⟩

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

	SURVEILLANCE		FREQUENCY
⟨Table 4.3.1.1-1⟩	SR 3.3.1.1.1	Perform CHANNEL CHECK.	12 hours
⟨Table 4.3.1.1-1, footnote (d)⟩	SR 3.3.1.1.2	------------------NOTE------------------ Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. -- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power ≤ 2% RTP ~~[plus any gain adjustment required by LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints"]~~ while operating at ≥ 25% RTP.	7 days 1
⟨Table 4.3.1.1-1, footnote (c)⟩	SR 3.3.1.1.3	Adjust the channel to conform to a calibrated flow signal.	7 days
⟨Table 4.3.1.1-1⟩ ⟨Table 4.3.1.1-1, footnote (k)⟩	SR 3.3.1.1.4 4 24	------------------NOTE------------------ Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. -- Perform CHANNEL FUNCTIONAL TEST.	7 days

(continued)

TSTF-264 changes not adopted [1]

<CTS> SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
<Table 4.3.1.1-1>	SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	7 days
<Table 4.3.1.1-1> <Table 4.3.1.1-1, footnote (b)>	SR 3.3.1.1.6	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to fully withdrawing SRMs ~~from the fully inserted position~~ [6]
<Table 4.3.1.1-1> <Table 4.3.1.1-1, footnote (b)>	SR 3.3.1.1.7	-------------------NOTE------------------- Only required to be met during entry into MODE 2 from MODE 1. --- Verify the IRM and APRM channels overlap.	7 days
<Table 4.3.1.1-1, footnote (f)>	SR 3.3.1.1.8	Calibrate the local power range monitors.	1000 ~~MWD/T average core exposure~~ effective full power hours [3]
<Table 4.3.1.1-1>	SR 3.3.1.1.9	Perform CHANNEL FUNCTIONAL TEST.	~~[~~92~~]~~ days [1]
	~~[SR 3.3.1.1.10~~	~~Calibrate the trip units.~~	~~[92] days]~~ [4]

(continued)

<Table 4.3.1.1-1>	SR 3.3.1.1.10	Peform CHANNEL CALIBRATION.	92 days [4]

<CTS>

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY
<Table 4.3.1.1-1>	SR 3.3.1.1.11	------NOTES------ 1. Neutron detectors are excluded. 2. For ~~F~~function [9] 2.a, not required to be performed when entering MODE 2 from MODE 1 until ~~12~~ 24 [4] hours after entering MODE 2. ------ Perform CHANNEL CALIBRATION.	184 days
<Table 4.3.1.1-1>	SR 3.3.1.1.12	Perform CHANNEL FUNCTIONAL TEST.	~~18~~ 24 [1] months
<Table 4.3.1.1-1> <Table 4.3.1.1-1, footnote (a)> <Table 4.3.1.1-1, footnote *>	SR 3.3.1.1.13	------NOTES------ 1. Neutron detectors are excluded. 2. For ~~F~~function [9] 1, not required to be performed when entering MODE 2 from MODE 1 until ~~12~~ 24 [4] hours after entering MODE 2. ------ Perform CHANNEL CALIBRATION.	~~18~~ 24 [1] months
<Table 4.3.1.1-1> <Table 4.3.1.1-1, footnote (h)>	SR 3.3.1.1.14	Verify the APRM Flow Biased Simulated Thermal Power—~~High~~ Upscale [5] time constant is ≤ ~~[~~7~~]~~ [1] seconds.	~~18~~ 24 [1] months
<4.3.1.2>	SR 3.3.1.1.15	Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18~~ 24 [1] months

(continued)

<CTS>

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
<Table 4.3.1.1-1, footnote (i)>	SR 3.3.1.1.16 Verify Turbine Stop Valve Closure ~~, Trip Oil Pressure—Low~~ and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is ≥ ~~40~~ 25 % RTP. 5	~~18~~ 24 months
<4.3.1.3> <DOC A.3> <Table 3.3.1-2, footnote *> <Table 3.3.1-2, footnote #> <Table 3.3.1-2, footnote ##>	SR 3.3.1.1.17 ----NOTES---- 1. Neutron detectors are excluded. 3. For Function ~~8~~ 5, "n" equals 4 channels for the purpose of determining the STAGGERED TEST BASIS Frequency. 2. For Functions 3 and 4, the sensor response times may be assumed to be the design sensor response time. 4. For Function 8, the limit switch response time may be conservatively assumed. 5. For Function 9, the RPS RESPONSE TIME is measured from start of turbine control valve fast closure. ---- Verify the RPS RESPONSE TIME is within limits.	~~18~~ 24 months on a STAGGERED TEST BASIS

<CTS>

<Table 3.3.1-1>

<Table 4.3.1.1-1>

<Table 2.2.1-1>

11

TSTF-264 changes not adopted

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitors					
a. Neutron Flux – High	2	~~[3]~~ 1	~~H~~ G 2	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.6 SR 3.3.1.1.7 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ [122/125] divisions of full scale
	5(a)	~~[3]~~ 1	~~I~~ H 2	SR 3.3.1.1.1 SR 3.3.1.1.5 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ [122/125] divisions of full scale
b. Inop	2	~~[3]~~ 1	~~H~~ G 2	SR 3.3.1.1.4 SR 3.3.1.1.15	NA
	5(a)	~~[3]~~ 1	~~I~~ H 2	SR 3.3.1.1.5 SR 3.3.1.1.15	NA
2. Average Power Range Monitors					
a. Neutron Flux – High, Setdown	2	~~[3]~~ 2 1	~~H~~ G 2	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.11 SR 3.3.1.1.15	≤ [20]% RTP
b. Flow Biased Simulated Thermal Power – ~~High~~ Upscale 5	1	~~[3]~~ 2 1	~~G~~ F 2	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.11 SR 3.3.1.1.14 SR 3.3.1.1.15 ~~SR 3.3.1.1.17~~ 10	≤ [~~0.66 W +~~ 0.58 W + 62 ~~67~~]% RTP and ≤ [~~111~~ 115.5]% RTP [(b)] 1

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

[(b) Allowable Value is ~~≤ 0.66 W + 43%~~ ≤ [0.58 W + 57.3 % RTP and ≤ 115.5%] RTP when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating."] 1

<Table 3.3.1.1-1>
<Table 4.3.1.1-1>
<Table 2.2.1-1>

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Average Power Range Monitors (continued)					
c. Fixed Neutron Flux — High	1	~~[2]~~ 2 [1]	~~F~~ F [2]	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.11 SR 3.3.1.1.15 SR 3.3.1.1.17	≤ [120]% RTP
d. Inop	1,2	~~[2]~~ 2 [1]	~~G~~ G [2]	SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.15	NA
3. Reactor Vessel Steam Dome Pressure — High	1,2	~~2~~ [1]	~~G~~ G [2]	~~SR 3.3.1.1.1~~ [4] SR 3.3.1.1.9 ~~[SR 3.3.1.1.10]~~ [4] SR 3.3.1.1.~~13~~ 10 [4] SR 3.3.1.1.15 SR 3.3.1.1.17	≤ ~~[1079.7]~~ 1056 [1] psig
4. Reactor Vessel Water Level — Low, Level 3	1,2	~~2~~ [1]	~~H~~ G [2]	SR 3.3.1.1.1 SR 3.3.1.1.9 ~~[SR 3.3.1.1.10]~~ [4] SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17	≥ ~~[10.8]~~ 10.9 [1] inches
~~5. Reactor Vessel Water Level — High, Level 8~~ [2]	~~≥ 25% RTP~~	~~[2]~~	~~G~~	~~SR 3.3.1.1.1~~ ~~SR 3.3.1.1.9~~ ~~[SR 3.3.1.1.10]~~ ~~SR 3.3.1.1.13~~ ~~SR 3.3.1.1.15~~ ~~SR 3.3.1.1.17~~	~~≤ [54.1] inches~~
~~6.~~ 5 [2] Main Steam Isolation Valve — Closure	1	~~[8]~~ [1]	~~I~~ F [2]	SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.17	≤ ~~[10]~~ 12 [1] % closed
~~7.~~ 6 [2] Drywell Pressure — High	1,2	~~2~~ [1]	~~H~~ G [2]	~~SR 3.3.1.1.1~~ [4] SR 3.3.1.1.9 ~~[SR 3.3.1.1.10]~~ [4] SR 3.3.1.1.13 SR 3.3.1.1.15	≤ ~~[1.43]~~ 1.93 [1] psig

(continued)

<CTS>

<Table 3.3.1-1>
ble 4.3.1.1-1>
Table 2.2.1-1>

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

7 - 2 FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE 1
~~8~~ 7. Scram Discharge Volume Water Level — High a. Transmitter/Trip Unit	1,2	~~2~~ - 1	~~G~~ G - 2	4 ~~SR 3.3.1.1.1~~ SR 3.3.1.1.9 ~~(SR 3.3.1.1.10)~~ SR 3.3.1.1.13 SR 3.3.1.1.15	≤ ~~[67]% of full scale~~ [767 ft 2.5 in] elevation (Unit 1) ≤ [767 ft 3.75 in] elevation (Unit 2)
	5(a)	~~2~~ - 1	~~H~~ H - 2	4 ~~SR 3.3.1.1.1~~ SR 3.3.1.1.9 ~~(SR 3.3.1.1.10)~~ SR 3.3.1.1.13 SR 3.3.1.1.15	≤ ~~[67]% of full scale~~ [767 ft 5.5 in] elevation - 1
b. Float Switch	1,2	~~2~~ - 1	~~G~~ G - 2	SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ ~~[65] inches~~
	5(a)	~~2~~ - 1	~~H~~ H - 2	SR 3.3.1.1.9 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ ~~[65] inches~~
8 - 2 ~~9~~. Turbine Stop Valve ~~-~~ Closure ~~Trip Oil Pressure — Low~~ 5	≥ ~~[40]~~ 25 - 1 % RTP	~~4~~ - 1	E	SR 3.3.1.1.9 4 ~~(SR 3.3.1.1.10)~~ SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17	≥ ~~[37] psig~~ [7]% closed - 1
9 - 2 ~~10~~. Turbine Control Valve Fast Closure, Trip Oil Pressure — Low	≥ ~~[40]~~ 25 - 1 % RTP	~~2~~ - 1	E	SR 3.3.1.1.9 4 - ~~(SR 3.3.1.1.10)~~ SR 3.3.1.1.13 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.17	≥ ~~[42]~~ 424 - 1 psig
10 - 2 ~~11~~. Reactor Mode Switch — Shutdown Position	1,2	~~2~~ - 1	G - 2	SR 3.3.1.1.12 SR 3.3.1.1.15	NA
	5(a)	~~2~~ - 1	H - 2	SR 3.3.1.1.12 SR 3.3.1.1.15	NA
11 - 2 ~~12~~. Manual Scram	1,2	~~2~~ 1	G - 2	SR 3.3.1.1.5 SR 3.3.1.1.15	NA
	5(a)	~~2~~ 1	H - 2	SR 3.3.1.1.5 SR 3.3.1.1.15	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.1.1 - RPS INSTRUMENTATION

1. The brackets have been removed and the proper plant specific information/value has been provided.

2. The LaSalle 1 and 2 design does not include a direct scram on high reactor vessel water level. Therefore, this Function (ISTS 3.3.1.1 Function 5) and associated ACTION and Surveillances have been deleted. The following requirements have been renumbered, where applicable, to reflect this deletion.

3. The Frequency for ISTS SR 3.3.1.1.8 (ITS SR 3.3.1.1.8) has been changed from 1000 MWD/T to 1000 effective full power hours consistent with the current licensing basis.

4. The current licensing basis time has been provided in the Note to ISTS SR 3.3.1.1.4. ISTS SR 3.3.1.10 has been deleted, since it is not required by current licensing basis. ITS SR 3.3.1.1.10 has been added to perform a CHANNEL CALIBRATION every 92 days for the Reactor Vessel Steam Dome Pressure—High Function, consistent with current licensing basis. Notes have been added to ISTS SR 3.3.1.1.17 to modify the RPS RESPONSE TIME testing of certain functions, consistent with current licensing basis. Finally, the requirement to perform CHANNEL CHECKS on certain functions has been deleted, consistent with current licensing basis.

5. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

6. The Frequency for ISTS SR 3.3.1.1.6 (ITS SR 3.3.1.1.6) has been changed from "Prior to withdrawing SRMs from the fully inserted position" to "Prior to fully withdrawing SRMs." The current licensing basis only requires the SRM/IRM overlap to be verified during a reactor startup. It does not require the overlap verification prior to withdrawing the SRMs from the fully inserted position. During the reactor startup, the operating staff will start to withdraw the SRMs prior to the IRMs coming on range. The SRM/IRM overlap is verified before the SRMs are fully withdrawn. Operating experience has shown that it may not always be possible to obtain proper overlap prior to reaching the SRM rod block setpoint with the SRMs fully inserted. Therefore, ITS SR 3.3.1.1.6 has been modified to reflect the current practice, and is consistent with current licensing basis.

7. An ACTIONS Note is added to allow time to adjust the gain for the APRMs. This Note is included in CTS Table 4.3.1.1-1 as footnote d, and is based on both the time frame necessary to accomplish multiple channel gain adjustments and the impact on safety. Only two hours are provided if the GAF is non-conservative, but 12 hours are allowed if the GAF is out of limits low since this makes the trip setpoint conservative.

8. For ITS Table 3.3.1.1-1 Function 8, Turbine Stop Valve—Closure, the response time is measured by installing a test switch in parallel with the limit switch. The test switch simulates the limit switch function, and the response time downstream of the test switch is measured. The response time of the limit switch is assumed to be 10 ms, which is added to the measured response time to obtain the total RPS RESPONSE TIME. This method has been previously accepted by the NRC, as documented in a letter from W. G. Guldemond (NRC) to C. Reed (ComEd), dated January 26, 1987. Therefore, Note 4 has been added to ISTS SR 3.3.1.1.17 (ITS SR 3.3.1.1.17) to take an exception to the definition of RPS RESPONSE TIME for Function 8 and maintain the current allowance.

9. Typographical/grammatical error corrected.

10. The ISTS 3.3.1.1 requirement to perform an RPS RESPONSE TIME test on the APRM Flow Biased Simulated Thermal Power—Upscale Function has been deleted since the Function is not credited in the safety analyses.

11. TSTF-264 deletes the Surveillances for SRM/IRM overlap during startup and the APRM/IRM overlap during shutdown. The TSTF states that these SRs are unnecessary since they duplicate the requirements of the CHANNEL CHECK. However, the CHANNEL CHECK definition does not specifically require overlap checks. There are other instruments that have overlapping ranges (e.g., reactor water level instruments), and no "overlap" checks are implied by the CHANNEL CHECK requirements for these instruments. Also, as stated in the TSTF Bases portion of the change, the SRM/IRM overlap check is only applicable during a startup and the APRM/IRM overlap check is only required during a shutdown. It would appear that if the CHANNEL CHECK definition requires overlap checks, it would require the checks both during a startup and during a shutdown for all instruments. In addition, the TSTF also provides Bases to the CHANNEL CHECK Surveillances that add requirements not in the actual CHANNEL CHECK Surveillances. For example, the CHANNEL CHECK is required to be performed every 12 hours in the actual Specification, but the TSTF Bases portion of the change requires the SRM/IRM overlap portion to be performed prior to withdrawing the SRMs. Therefore, this TSTF is not being adopted and the individual overlap SRs are being maintained.

<CTS> 3.3 INSTRUMENTATION

3.3.1.2 Source Range Monitor (SRM) Instrumentation

<LCO 3.3.7.6>
<LCO 3.9.2>

LCO 3.3.1.2 The SRM instrumentation in Table 3.3.1.2-1 shall be OPERABLE.

<Appl 3.3.7.6>
<Appl 3.3.7.6, footnote *>
<Appl 3.9.2>

APPLICABILITY: According to Table 3.3.1.2-1.

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
<3.3.7.6 Act a>	A. One or more required SRMs inoperable in MODE 2 with intermediate range monitors (IRMs) on Range 2 or below.	A.1	Restore required SRMs to OPERABLE status.	4 hours
<DOC L.1>	B. ~~Four~~ Three 1 required SRMs inoperable in MODE 2 with IRMs on Range 2 or below.	B.1	Suspend control rod withdrawal.	Immediately
<3.3.7.6 Act a>	C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	12 hours
<3.3.7.6 Act b>	D. One or more required SRMs inoperable in MODE 3 or 4.	D.1 AND	Fully insert all insertable control rods.	1 hour

(continued)

<CTS>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.7.6 Act b> D. (continued)	D.2 Place reactor mode switch in the shutdown position.	1 hour
<3.9.2 Act> E. One or more required SRMs inoperable in MODE 5.	E.1 Suspend CORE ALTERATIONS except for control rod insertion. <u>AND</u> E.2 Initiate action to [2] fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately Immediately

<CTS>

SURVEILLANCE REQUIREMENTS

<DOC A.3>

-----NOTE-----
Refer to Table 3.3.1.2-1 to determine which SRs apply for each applicable MODE or other specified condition~~s~~. [2]

	SURVEILLANCE	FREQUENCY
<4.3.7.6.a.1.a> <4.9.2.a.1>	SR 3.3.1.2.1 Perform CHANNEL CHECK.	12 hours
<LCO 3.9.2.b> <4.9.2.a.3>	SR 3.3.1.2.2 -----NOTES----- 1. Only required to be met during CORE ALTERATIONS. 2. One SRM may be used to satisfy more than one of the following. ----- Verify an OPERABLE SRM detector is located in: a. The fueled region; b. The core quadrant where CORE ALTERATIONS are being performed when the associated SRM is included in the fueled region; and c. A core quadrant adjacent to where CORE ALTERATIONS are being performed, when the associated SRM is included in the fueled region.	12 hours
<4.3.7.6.a.1.b>	SR 3.3.1.2.3 Perform CHANNEL CHECK.	24 hours

(continued)

<CTS>

SURVEILLANCE REQUIREMENTS (continued)

		SURVEILLANCE	FREQUENCY
<4.3.7.6.c> <4.3.7.6.c, footnote #> <4.9.2.c> <4.9.2.c, footnote #>	SR 3.3.1.2.4	-------------------NOTE------------------- Not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant. -- Verify count rate is: a. ≥ [3.0] cps ~~with a signal to noise ratio ≥ [2:1]~~ 5 ; or 3 1 b. ≥ [0.7] cps with a signal to noise ratio ≥ [20:1].	12 hours during CORE ALTERATIONS AND 24 hours
<4.9.2.b>	SR 3.3.1.2.5	Insert SR 3.3.1.2.5 Note 4 Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. 11	7 days
<4.3.7.6.b>	SR 3.3.1.2.6	-------------------NOTE------------------- Not required to be performed until 12 hours after IRMs on Range 2 or below. -- Perform CHANNEL FUNCTIONAL TEST [and determination of signal to noise ratio]. 11	31 days
<4.3.7.6.a.2> <4.3.7.6.a.2, footnote **> <DOC M.3>	SR 3.3.1.2.7	-------------------NOTES------------------- 1. Neutron detectors are excluded. 2. Not required to be performed until 12 hours after IRMs on Range 2 or below. -- Perform CHANNEL CALIBRATION.	24 11 ~~[28]~~ months

<CTS>

Insert SR 3.3.1.2.5

<4.9.2.b>

-----------------------------------NOTE -----------------------------------

The determination of signal to noise ratio is not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies in the associated core quadrant.

<CTS>

<LCO 3.3.7.6>

Table 3.3.1.2-1 (page 1 of 1)
Source Range Monitor Instrumentation

<Appl 3.3.7.6>
<Appl 3.3.7.6, footnote *>
<LCO 3.9.2>
<Appl 3.9.2>
<3.9.2, footnote *>
<DOC L.8>

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Source Range Monitor	2(a)	~~2~~ 3 II	SR 3.3.1.2.1 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	3,4	2	SR 3.3.1.2.3 SR 3.3.1.2.4 SR 3.3.1.2.6 SR 3.3.1.2.7
	5	2(b),(c)	SR 3.3.1.2.1 SR 3.3.1.2.2 SR 3.3.1.2.4 SR 3.3.1.2.5 SR 3.3.1.2.7

(a) With IRMs on Range 2 or below.

(b) Only one SRM channel is required to be OPERABLE during spiral offload or reload when the fueled region includes only that SRM detector.

(c) Special movable detectors may be used in place of SRMs if connected to normal SRM circuits.

1. The brackets have been removed and the proper plant specific information/value has been provided.

2. Editorial change made to be consistent with other similar requirements in the ITS or for clarity.

3. Typographical/grammatical error corrected.

4. A new Note has been added to ISTS SR 3.3.1.2.5 to state that the determination of the signal to noise ratio is not required to be met with less than or equal to four fuel assemblies adjacent to the SRM and no other fuel in the associated core quadrant. When starting to load fuel from the defueled condition, SR 3.3.1.2.5 must be current prior to the start of fuel load. However, with no fuel in the core, a signal to noise ratio cannot be determined. Therefore, this Note has been added similar to the Note in the count rate Surveillance (ISTS SR 3.3.1.2.4), which is for the same reason as this proposed Note.

5. Changes have been made to be consistent with the current LaSalle 1 and 2 licensing basis.

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

1

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more rod withdrawal limiter (RWL) channels inoperable.	A.1	Suspend control rod withdrawal.	Immediately
B. One or more rod pattern controller channels inoperable.	B.1	Suspend control rod movement except by scram.	Immediately
C. One or more Reactor Mode Switch—Shutdown Position channels inoperable.	C.1	Suspend control rod withdrawal.	Immediately
	AND		
	C.2	Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

1

SURVEILLANCE REQUIREMENTS

-----NOTES-----

1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

2. When an RWL channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1.1	-----NOTE----- Not required to be performed until 1 hour after THERMAL POWER is > [70]% RTP. ----- Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.2.1.2	-----NOTE----- Not required to be performed until 1 hour after THERMAL POWER is > 35% RTP and ≤ 70% RTP. ----- Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.2.1.3	-----NOTE----- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ [10]% RTP in MODE 2. ----- Perform CHANNEL FUNCTIONAL TEST.	[92] days

(continued)

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.4	------------------NOTE------------------- Not required to be performed until 1 hour after THERMAL POWER is ≤ [10]% RTP in MODE 1. -- Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.2.1.5	Calibrate the trip unit.	92 days
SR 3.3.2.1.6	Verify the RWL high power Function is not bypassed when THERMAL POWER is > [70]% RTP.	92 days
SR 3.3.2.1.7	Perform CHANNEL CALIBRATION. The Allowable Value shall be: a. Low power setpoint, > [10]% RTP and ≤ [35]% RTP; and b. High power setpoint, ≤ [70]% RTP.	184 days
SR 3.3.2.1.8	------------------NOTE------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -- Perform CHANNEL FUNCTIONAL TEST.	[18] months

(continued)

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.1.9	Verify the bypassing and movement of control rods required to be bypassed in Rod Action Control System (RACS) by a second licensed operator or other qualified member of the technical staff.	Prior to and during the movement of control rods bypassed in RACS

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

1

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS
1. Rod Pattern Control System			
a. Rod withdrawal limiter	[(a)]	2	SR 3.3.2.1.1 SR 3.3.2.1.6 SR 3.3.2.1.7
	[(b)]	2	SR 3.3.2.1.2 SR 3.3.2.1.5 SR 3.3.2.1.7
b. Rod pattern controller	1(c),2(c)	2	SR 3.3.2.1.3 SR 3.3.2.1.4 SR 3.3.2.1.5 SR 3.3.2.1.7 SR 3.3.2.1.9
2. Reactor Mode Switch – Shutdown Position	(d)	2	SR 3.3.2.1.8

(a) THERMAL POWER > [70]% RTP.

(b) THERMAL POWER > [35]% RTP and ≤ 70% RTP.

(c) With THERMAL POWER ≤ [10]% RTP.

(d) Reactor mode switch in the shutdown position.

INSERT ITS 3.3.2.1 (BWR/4 ISTS 3.3.2.1) 1

<CTS>

1 INSERT BWR/4 ISTS 3.3.2.1 *

3.3 INSTRUMENTATION

3.3.2.1 Control Rod Block Instrumentation

<LCO 3.3.6>
<LCO 3.1.4.1>
<LCO 3.1.4.3>

LCO 3.3.2.1 The control rod block instrumentation for each Function in Table 3.3.2.1-1 shall be OPERABLE.

<APPL 3.3.6>
<APPL 3.1.4.1>
<APPL 3.1.4.3>

APPLICABILITY: According to Table 3.3.2.1-1.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.6 Act a> <3.3.6 Act b> <Table 3.3.6-1, Action 60> <3.1.4.3, Act a> <3.1.4.3 Act b>	A. One rod block monitor (RBM) channel inoperable.	A.1 Restore RBM channel to OPERABLE status.	24 hours
<3.3.6 Act a> <3.3.6 Act b> <Table 3.3.6-1, Action 60> <3.1.4.3 Act b>	B. Required Action and associated Completion Time of Condition A not met. OR Two RBM channels inoperable.	B.1 Place one RBM channel in trip.	1 hour
<3.1.4.1 Act a>	C. Rod worth minimizer (RWM) inoperable during reactor startup.	C.1 Suspend control rod movement except by scram. OR	Immediately (continued)

* This BWR/4 Specification Insert was used because it best represented the LaSalle 1 and 2 design

Insert Page 3.3-19a

INSERT BWR/4 ISTS 3.3.2.1 [1]
(continued)

<CTS>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.1.4.1 Act a> C. (continued)	C.2.1.1 Verify ≥ 12 rods withdrawn. OR C.2.1.2 Verify by administrative methods that startup with RWM inoperable has not been performed in the last calendar year. AND C.2.2 Verify movement of control rods is in compliance with ~~banked position withdrawal sequence (BPWS)~~ analyzed rod position sequence [6] by a second licensed operator or other qualified member of the technical staff.	Immediately Immediately During control rod movement
<3.1.4.1 Act a> D. RWM inoperable during reactor shutdown.	D.1 Verify movement of control rods is in ~~accordance~~ Compliance [2] with ~~BPWS~~ analyzed rod position sequence [6] by a second licensed operator or other qualified member of the technical staff.	During control rod movement

(continued)

Insert Page 3.3-19b

<CTS>

INSERT BWR/4 ISTS 3.3.2.1 $\boxed{1}$
(Continued)

ACTIONS (continued)

<DOC M.5>

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One or more Reactor Mode Switch—Shutdown Position channels inoperable.	E.1 Suspend control rod withdrawal.	Immediately
	<u>AND</u>	
	E.2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

-------------------------------------NOTES-------------------------------------

<4.3.6>
1. Refer to Table 3.3.2.1-1 to determine which SRs apply for each Control Rod Block Function.

<4.3.6 footnote *>
2. When an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability.

<Table 4.3.6-1>
<4.1.4.3.a>

SURVEILLANCE	FREQUENCY
SR 3.3.2.1.1 Perform CHANNEL FUNCTIONAL TEST.	*92* days $\boxed{3}$

(continued)

Insert Page 3.3-19c

<CTS> INSERT BWR/4 ISTS 3.3.2.1 [1]
(CONTINUED)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
<Appl 3.1.4.1, footnote *> <4.1.4.1.a> <4.1.4.1b> SR 3.3.2.1.2	-----NOTE----- Not required to be performed until 1 hour after any control rod is withdrawn at ≤ ~~[10]~~% RTP in MODE 2. ----- Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days [3]
<4.1.4.1a> <4.1.4.1c> SR 3.3.2.1.3	-----NOTE----- Not required to be performed until 1 hour after THERMAL POWER is ≤> ~~[10]~~% RTP in MODE 1. ----- Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days [3]
<DOC M.2> SR 3.3.2.1.~~4~~ [4] 5	~~-----NOTE----- Neutron detectors are excluded. -----~~ [3] Verify the RB~~M~~ [5] is not bypassed when THERMAL POWER is ≥ 30% RTP and a peripheral control rod is not selected. ~~a. Low Power Range—Upscale Function is not bypassed when THERMAL POWER is ≥ 29% and ≤ 64% RTP. b. Intermediate Power Range—Upscale Function is not bypassed when THERMAL POWER is > 64% and ≤ 84% RTP. c. High Power Range—Upscale Function is not bypassed when THERMAL POWER is > 84% RTP.~~	~~[18]~~ 24 months [3]
<DOC M.4> SR 3.3.2.1.~~5~~ [4] 6	Verify the RWM is not bypassed when THERMAL POWER is ≤ ~~[10]~~% RTP.	~~[18]~~ 24 months [3]

(continued)

Insert SR 3.3.2.1.4 from next page [4]

Insert Page 3.3-19d

INSERT BWR/4 ISTS 3.3.2.1 1
(CONTINUED)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
<DOC M.5>	SR 3.3.2.1.~~6~~ 7 4	-------------------NOTE------------------- Not required to be performed until 1 hour after reactor mode switch is in the shutdown position. -- Perform CHANNEL FUNCTIONAL TEST.	~~18~~ 24 months	3
<Table 4.3.6-1> <Table 4.3.6-1, footnote (a)> <4.1.4.3.a>	SR 3.3.2.1.~~7~~ 4 4	-------------------NOTE------------------- Neutron detectors are excluded. -- Perform CHANNEL CALIBRATION.	~~18 months~~ 92 days 3	Move to previous page as indicated 4
<4.1.4.1.d>	SR 3.3.2.1.8	Verify control rod sequences input to the RWM are in conformance with ~~BPWS~~ analyzed rod position sequence 6	Prior to declaring RWM OPERABLE following loading of sequence into RWM	
<3.1.4.1 Act b>	SR 3.3.2.1.9	Verify the bypassing and position of control rods required to be bypassed in RWM by a second licensed operator or other qualified member of the technical staff.	Prior to and during the movement of control rods bypassed in RWM	7

Insert Page 3.3-19e

<CTS>

INSERT BWR/4 ISTS 3.3.2.1 [1]
(CONTINUED)

<Table 3.3.6-1>
<DOC M.5>
<Table 3.3.6-1, footnote *>
<Table 3.3.6-2>
<Table 4.3.6-1>
<LCO 3.1.4.1>
<Appl 3.1.4.1>
<LCO 3.1.4.3>
<Appl 3.1.4.3>

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Rod Block Monitor				
[6] a. ~~Low Power Range~~ - Upscale	(a)	[3] ~~[2]~~	SR 3.3.2.1.1 SR 3.3.2.1.~~4~~ [5] SR 3.3.2.1.~~7~~ [4]	~~≤ [115.5/125] divisions of full scale~~ as specified in the COLR [6]
[5] ~~b. Intermediate Power Range - Upscale~~	~~(b)~~	~~[2]~~	~~SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7~~	~~≤ [109.7/125] divisions of full scale~~
~~c. High Power Range - Upscale~~	~~(c),(d)~~	~~[2]~~	~~SR 3.3.2.1.1 SR 3.3.2.1.4 SR 3.3.2.1.7~~	~~≤ [105.9/125] divisions of full scale~~
[5] b. ~~d.~~ Inop	[5] (a) ~~(d),(e)~~	[3] ~~[2]~~	SR 3.3.2.1.1 SR 3.3.2.1.5 [5]	NA
[3] c. ~~e.~~ Downscale	[5] (a) ~~(d),(e)~~	[3] ~~[2]~~	SR 3.3.2.1.1 SR 3.3.2.1.~~7~~ [4] (4)	~~≥ [93/125] divisions of full scale~~ ≥ 3% RTP [6]
[5] ~~f. Bypass Time Delay~~	~~(d),(e)~~	~~[2]~~	~~SR 3.3.2.1.1 SR 3.3.2.1.7~~	~~≤ [2.0] seconds~~
2. Rod Worth Minimizer	1~~(f)~~,2~~(f)~~ (b) [5]	[3] ~~[1]~~	SR 3.3.2.1.2 SR 3.3.2.1.3 SR 3.3.2.1.~~5~~ (6) [4] ~~SR 3.3.2.1.8~~ SR 3.3.2.1.9 [7]	NA
3. Reactor Mode Switch - Shutdown Position	~~(g)~~ (c) [5]	[3] ~~[2]~~	SR 3.3.2.1.~~6~~ (7) [4]	NA

[5]
(a) THERMAL POWER ≥ ~~[29]%~~ 30% RTP and ~~≤ [64]% RTP and MCPR < 1.70~~ no peripheral control rod selected.

~~(b) THERMAL POWER > [64]% and ≤ [84]% RTP and MCPR < 1.70.~~

~~(c) THERMAL POWER > [84]% and < 90% RTP and MCPR < 1.70.~~

~~(d) THERMAL POWER ≥ 90% RTP and MCPR < 1.40.~~

~~(e) THERMAL POWER ≥ [64]% and < 90% RTP and MCPR < 1.70.~~

(b) ~~(f)~~ With THERMAL POWER ≤ ~~[10]%~~ 10% RTP.

(c) ~~(g)~~ Reactor mode switch in the shutdown position.

<INSERT ITS 3.3.2.2 (BWR/4 ISTS 3.3.2.2)> [8]

Insert Page 3.3-19f

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.2.1 - CONTROL ROD BLOCK INSTRUMENTATION

1. The BWR/6 ISTS 3.3.2.1 has been deleted and, in its place, the BWR/4 ISTS 3.3.2.1 (from NUREG-1433, Rev. 1) has been used since the LaSalle 1 and 2 design is similar to the BWR/4 design with regards to the control rod block instrumentation. Any deviations from the BWR/4 ISTS are discussed below.

2. Editorial change made to be consistent with Required Action C.2.2.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. The Surveillances have been placed in the proper order, based on decreasing Frequency, consistent with the Writer's Guide convention. The change from the ISTS order was necessary due to the change in Frequency (to be consistent with current licensing basis) for ISTS SR 3.3.2.1.7 (ITS SR 3.3.2.1.4). The requirements have been renumbered, where applicable, to reflect their new order.

5. ISTS SR 3.3.2.1.4 and ISTS Table 3.3.2.1-1, Note (a) have been modified and ISTS Table 3.3.2.1-1, Functions 1.b, 1.c, and 1.f, including Notes (b), (c), (d), and (e) have been deleted to be consistent with the LaSalle 1 and 2 RBM design. The RBM design in the ISTS is based on a "Post-ARTS" RBM design. LaSalle 1 and 2 has not installed the "ARTS" RBM modification. In addition, the requirements have been renumbered, where applicable, to reflect the deletions.

6. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

7. A new Surveillance Requirement has been added, ITS SR 3.3.2.1.9. This Surveillance Requirement is similar to the BWR/6 ISTS SR 3.3.2.1.9, since the Rod Worth Minimizer at LaSalle 1 and 2 includes the capability to bypass individual control rods. Therefore, the BWR/6 ISTS SR 3.3.2.1.9 is used and is modified to reflect the LaSalle 1 and 2 current licensing basis.

8. A new Specification has been added, ITS 3.3.2.2. This Specification is from the BWR/4 ISTS (NUREG-1433 ISTS 3.3.2.2), since the LaSalle 1 and 2 design is similar to the BWR/4 design with regard to the Feedwater System and Main Turbine High Water Level Trip Instrumentation. Therefore, the BWR/4 Specification is used and any deviations from the BWR/4 ISTS are discussed in the Justification for Deviations for ITS: 3.3.2.2.

<CTS>

Insert BWR/4 ISTS 3.3.2.2 * [1]

3.3 INSTRUMENTATION

System [2]

3.3.2.2 Feedwater and Main Turbine High Water Level Trip Instrumentation

Four [3] system [2]

<LCO 3.3.8> <Table 3.3.8-1> <Table 3.3.8-2> <Table 4.3.8.1-1>

LCO 3.3.2.2 ~~[Three]~~ channels of feedwater and main turbine high water level trip instrumentation shall be OPERABLE.

[3]

<Appl 3.3.8> APPLICABILITY: THERMAL POWER ≥ ~~[25]~~% RTP.

ACTIONS

NOTE

<DOC A.2> Separate Condition entry is allowed for each channel.

[4] or more

system [2]

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.8 Act a> <3.3.8 Act b.2> A. One or more feedwater system and main turbine high water level trip channel(s) [4] inoperable.	A.1 Place channel in trip.	7 days
<3.3.8 Act a> <3.3.8 Act b.1> B. ~~Two or more~~ feedwater system and main turbine high water level trip ~~channels inoperable~~ capability not maintained. [4]	B.1 Restore feedwater system [2] and main turbine high water level trip capability.	2 hours
<3.3.8 Act c> C. Required Action and associated Completion Time not met.	C.1 C.2 [5] Reduce THERMAL POWER to < ~~[25]~~% RTP. [3]	4 hours
	C.1 NOTE Only applicable if inoperable channel is the result of an inoperable motor-driven feedwater pump breaker or feedwater turbine stop valve. Remove affected feedwater pump(s) from service OR [5]	4 hours

* This BWR/4 Specification Insert was used because it best represented the LaSalle 1 and 2 design.

Insert Page 3.3-19g

<CTS>

Insert BWR/4 ISTS 3.3.2.2 [1]
(continued)

System [2]

SURVEILLANCE REQUIREMENTS

<Table 3.3.8-1, footnote *>

-----NOTE-----
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided feedwater and main turbine high water level trip capability is maintained. System [2]

CTS	SURVEILLANCE	FREQUENCY
<4.3.8-1> <Table 4.3.8.H>	~~[~~SR 3.3.2.2.1 Perform CHANNEL CHECK.	~~24~~ 12 hours ~~]~~ [3]
<4.3.8.1> <Table 4.3.8.1-1>	SR 3.3.2.2.2 Perform CHANNEL FUNCTIONAL TEST.	~~[~~92~~]~~ days [3]
<4.3.8.1> <Table 3.3.8-2> <Table 4.3.8.1.1-1>	SR 3.3.2.2.3 Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ ~~[58.0]~~ 59.6 [3] inches.	~~[18]~~ 24 months [3]
<4.3.8.2>	SR 3.3.2.2.4 Perform LOGIC SYSTEM FUNCTIONAL TEST (5) [6] including ~~[~~valve~~]~~ breaker and [3] actuation.	~~[18]~~ 24 months [3]

Insert Page 3.3-19h

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.2.2 - FEEDWATER SYSTEM AND MAIN TURBINE HIGH
WATER LEVEL TRIP INSTRUMENTATION

1. A new Specification has been added, ITS 3.3.2.2. This Specification is from the BWR/4 ISTS (NUREG-1433, Rev. 1), since the LaSalle 1 and 2 design is similar to the BWR/4 design with regards to the feedwater system and main turbine high water level trip instrumentation. Therefore, the BWR/4 ISTS is used and any deviations from the BWR/4 ISTS are discussed below.

2. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. The LaSalle 1 and 2 Feedwater System and Main Turbine High Water Level Trip Instrumentation includes four channels. ISTS 3.3.2.2. ACTIONS A and B are written for a three channel design. For a three channel design, when two of the three channels are inoperable, a loss of function has occurred. However, the LaSalle 1 and 2 design is such that with two channels inoperable, a loss of function may not have occurred. Therefore, consistent with current licensing basis, ISTS 3.3.2.2 Condition A has been modified to be applicable to one or more inoperable channels, and ISTS 3.3.2.2 Condition B has been modified to be applicable to when a loss of function has occurred (i.e., trip capability not maintained). This change is consistent with the intent of the ISTS, which requires the 2 hour Completion Time of ACTION B to be applicable only when a loss of function has occurred.

5. ISTS 3.3.2.2 Required Action C.1 requires a reduction in Thermal Power to $\leq$ 25% RTP if the Feedwater System and Main Turbine High Water Level Trip Instrumentation is not restored to Operable status. The instrumentation indirectly supports maintaining MCPR above limits during a feedwater controller failure, maximum demand event. This is accomplished by tripping the main turbine, with the main turbine trip resulting in a subsequent reactor scram. When the instrumentation is inoperable solely due to an inoperable motor-driven feedwater pump breaker or feedwater turbine stop valve, the unit can continue to operate with the associated feedwater pump removed from service. Therefore, an additional Required Action is proposed, ITS 3.3.2.2, Required Action C.1, to allow removal of the associated feedwater pump(s) from service in lieu of reducing Thermal Power. This Required Action will only be used if the instrumentation is inoperable solely due to an inoperable motor-driven feedwater pump breaker or feedwater turbine stop valve, as stated in the Note to ITS 3.3.2.2 Required Action C.1. Since this Required Action accomplishes the functional purpose of the Feedwater System and Main Turbine High Water Level

5. (continued)

Trip Instrumentation, enables continued operation in a previously approved condition, and still supports maintaining MCPR above limits (since the reactor scram is the result of a turbine trip signal, which is not impacted by this change), this change does not have a significant effect on safe operation. In addition, ISTS 3.3.2.2 Required Action C.1 has been renumbered due to this addition.

6. Editorial change made to be consistent with other similar requirements in the ITS or for clarity.

<CTS>

3.3 INSTRUMENTATION

3.3.3.1 Post Accident Monitoring (PAM) Instrumentation

<LCO 3.3.7.5> LCO 3.3.3.1 The PAM instrumentation for each Function in Table 3.3.3.1-1 shall be OPERABLE.

<Appl 3.3.7.5> APPLICABILITY: MODES 1 and 2.

ACTIONS

------------------------------------NOTES------------------------------------

<DOC L.1> 1. LCO 3.0.4 is not applicable.

<DOC A.2> 2. Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.7.5 Act> <Table 3.7.5-1, Action 80.a> <Table 3.3.7.5-1, Action 81> <Table 3.3.7.5-1 Action 82a>	A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
<3.3.7.5 Act> <DOC L.4> <Table 3.3.7.5-1, Action 9>	B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8 6	Immediately 1
<3.3.7.5 Act> <Table 3.3.7.5-1, Action 80b> <Table 3.3.7.5-1, Action 81> <Table 3.3.7.5-1, Action 82b>	C. 2 ~~-----NOTE----- Not applicable to [hydrogen monitor] channels.~~ One or more Functions with two required channels inoperable.	C.1 Restore one required channel to OPERABLE status.	7 days

(continued)

<CTS>

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
2	~~D. Two [required hydrogen monitor] channels inoperable.~~	~~D.1 Restore one [required hydrogen monitor] channel to OPERABLE status.~~	~~72 hours~~
<3.3.7.5 Act> <Table 3.3.7.5-1, Action 80b> <Table 3.3.7.5-1, Action 81> <Table 3.3.7.5-1, Action 82b>	D ~~E~~. 2 Required Action and associated Completion Time of Condition C ~~or D~~ not met.	~~E~~ D 2 .1 Enter the Condition referenced in Table 3.3.3.1-1 for the channel.	Immediately
<3.3.7.5 Act> <Table 3.3.7.5-1, Action 80b> <Table 3.3.7.5-1, Action 82b>	E ~~F~~. 2 As required by Required Action ~~E.1~~ D.1 2 and referenced in Table 3.3.3.1-1.	E 2 ~~F~~.1 Be in MODE 3.	12 hours
<3.3.7.5 Act> <Table 3.3.7.5-1, Action 81>	F ~~G~~. 2 As required by Required Action ~~E.1~~ D.1 2 and referenced in Table 3.3.3.1-1.	~~G~~ F 2 .1 Initiate action in accordance with Specification 5.6.~~8~~ 6 1	Immediately 3

<CTS>

SURVEILLANCE REQUIREMENTS 5

NOTES 5

<4.3.7.5> 1. These SRs apply to each Function in Table 3.3.3.1-1, except where identified in the SR. 4

<DOC L.2> INSERT SR NOTE 5

	SURVEILLANCE	FREQUENCY
<Table 4.3.7.5-1>	SR 3.3.3.1.1 Perform CHANNEL CHECK.	31 days
<Table 4.3.7.5-1>	SR 3.3.3.1.~~2~~ 3 4 Perform CHANNEL CALIBRATION for Functions other than Functions 7 and 8. 4	~~18~~ 24 3 months
<Table 4.3.7.5-1>	SR 3.3.3.1.2 Perform CHANNEL CALIBRATION for Functions 7 and 8.	92 days 4

<CTS>

<DOC L.2>

Insert SR NOTE

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the other required channel in the associated Function is OPERABLE.

<CTS>

<Table 3.3.7.5-1>
Table 4.3.7.5-1>

Table 3.3.3.1-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION R D.1
1. Reactor Steam Dome Pressure	2	~~R~~ E
2. Reactor Vessel Water Level a. Fuel Zone b. Wide Range	2 2	E ~~F~~ E
~~3.~~ Suppression Pool Water Level	2	~~F~~
4. Drywell Pressure a. Narrow Range b. Wide Range	2 2	E ~~F~~ E
5. Primary Containment ~~Area~~ Gross Gamma Radiation	2	~~F~~ F
~~6. Drywell Sump Level~~	~~2~~	~~F~~
~~7. Drywell Drain Sump Level~~	~~2~~	~~F~~
6 ~~8~~. PCIV Position Penetration Flow Path	2 per penetration flow path(a)(b)	~~F~~ E
~~9. Wide Range Neutron Flux~~	~~2~~	~~F~~
7 ~~10~~. Drywell ~~H_2 &~~ O_2 Analyzer	2	~~F~~ E
8 ~~11~~. ~~Containment~~ Drywell H_2 ~~& O_2~~ Analyzer Concentration	2	~~F~~ E
~~12. Primary Containment Pressure~~	~~2~~	~~F~~
9 ~~13~~. [Relief Valve Discharge Location] Suppression Pool Water Temperature	2 ~~(c)~~	~~F~~ E

(a) Not required for isolation valves whose associated penetration flow path is isolated by at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

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

~~(c) Monitoring each (relief valve discharge location).~~

~~Reviewer's Note: Table 3.3.3.1-1 shall be amended for each plant as necessary to list:~~
~~1. All Regulatory Guide 1.97, Type A instruments, and~~
~~2. All Regulatory Guide 1.97, Category 1, non-Type A instruments specified in the plant's Regulatory Guide 1.97, Safety Evaluation Report.~~

2 6 7 8 TSTF-295

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.3.1 - POST ACCIDENT MONITORING INSTRUMENTATION

1. The proper Specification number has been provided.

2. ISTS 3.3.3.1 ACTION D and the Note in ISTS 3.3.3.1 Condition C have been deleted. These requirements specify a 72 hour Completion Time to restore one hydrogen monitor to OPERABLE status when two hydrogen monitors are inoperable. This change will allow a 7 day Completion Time to restore one hydrogen monitor when both are inoperable, as shown in ITS 3.3.3.1 ACTION C. There is no difference, with respect to their importance during an accident, between the H_2 and O_2 monitors and other PAM instrumentation. In addition, the requirements have been renumbered, where applicable, to reflect this deletion.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. A Surveillance Requirement (SR 3.3.3.1.2) to perform a CHANNEL CALIBRATION of the Drywell H_2 and O_2 Concentration Analyzer (ITS Table 3.3.3.1-1, Functions 7 and 8) on a 92 day Frequency has been added. This change was made to reflect manufacturer's recommendations. The subsequent Surveillance has been modified and renumbered and the Note to the Surveillance Requirements Table has been modified due to this addition.

5. A Note has been added to the Surveillance Requirements (Note 2 for ITS 3.3.3.1) to allow a channel to be inoperable for up to 6 hours solely for performance of required Surveillances provided the other channel(s) in the associated Function are OPERABLE. The 6 hour testing allowance has been granted by the NRC in Technical Specification amendments for Hatch Unit 1 (amendment 185) and Unit 2 (amendment 125), WNP-2 (amendment 149, the ITS amendment), and Nine Mile Point Unit 2 (amendment 91, the ITS amendment). The NRC has also granted this allowance in other topical reports for the RPS, ECCS, and isolation instrumentation. In addition, the current Note to the Surveillance Requirements for ITS 3.3.3.1 has been numbered "1" to reflect this addition.

6. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

7. This Reviewer's Note has been deleted and the appropriate instruments have been added to the Table, consistent with the Note. The Note is not meant to be retained in the final version of the plant specific submittal. In addition, the Functions have been renumbered, where applicable, to reflect the additions and deletions.

8. The bracketed TSTF-295 revisions associated with Suppression Pool Water Temperature (BWR NUREG-1434, ISTS Table 3.3.3.1-1, Function 13) are not incorporated in proposed LaSalle 1 and 2 ITS Table 3.3.3.1-1 (Function 9). This difference is consistent with current licensing requirements for the Suppression Pool Water Temperature. All required temperature sensors associated with a channel (irrespective of sensor location) are required to be OPERABLE for the channel to be OPERABLE.

Monitoring 4

<CTS>

3.3 INSTRUMENTATION

3.3.3.2 Remote Shutdown Monitoring System 4

<LCO 3.3.7.4> LCO 3.3.3.2 The Remote Shutdown Monitoring System Functions ~~in Table 3.3.3.2-1~~ shall be OPERABLE. 4 TSTF-266

<Appl 3.3.7.4> APPLICABILITY: MODES 1 and 2.

ACTIONS

-----------------------------------NOTES-----------------------------------

<3.3.7.4 Act b> 1. LCO 3.0.4 is not applicable.

<DOC A.2> 2. Separate Condition entry is allowed for each Function.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.7.4 Act a>	A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days
<3.3.7.4 Act a>	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

<DOC L.2> 2

-----------------------------------NOTE-----------------------------------

When an instrumentation Channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
<4.3.7.4> <Table 4.3.7.4-1> 3	SR 3.3.3.2.1 Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days 3

(continued)

<CTS>

4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
~~SR 3.3.3.2.2~~	~~Verify each required control circuit and transfer switch is capable of performing the intended functions.~~	~~[18] months~~
SR 3.3.3.2.~~3~~ 2	Perform CHANNEL CALIBRATION for each required instrumentation channel.	~~[18]~~ 24 months

14

<4.3.7.4>
<Table 4.3.7.4-1>

4

3

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Table 3.3.3.2-1 (page 1 of 1)
Remote Shutdown System Instrumentation

FUNCTION (INSTRUMENT OR CONTROL PARAMETER)	REQUIRED NUMBER OF DIVISIONS
1. Reactor Pressure Vessel Pressure Control	
a. Reactor Pressure	[1]
2. Decay Heat Removal	
a. RCIC Flow	[1]
b. RCIC Controls	[1]
c. RHR Flow	[1]
d. RHR Controls	[1]
3. Reactor Pressure Vessel Inventory Control	
a. RCIC Flow	[1]
b. RCIC Controls	[1]
c. RHR Flow	[1]
d. RHR Controls	[1]

Reviewer's Note: This Table is for illustration purposes only. It does not attempt to encompass every Function used at every plant, but does contain the types of Functions commonly found.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.3.2 - REMOTE SHUTDOWN MONITORING SYSTEM

1. Not used.

2. A Note has been added to the Surveillance Requirements (Note for ITS 3.3.3.2) to allow a channel to be inoperable for up to 6 hours solely for performance of required Surveillances. The 6 hour testing allowance has been granted by the NRC in Technical Specification amendments for Hatch Unit 1 (amendment 185) and Unit 2 (amendment 125), WNP-2 (amendment 149, the ITS amendment), and Nine Mile Point Unit 2 (amendment 91, the ITS amendment). The NRC has also granted this allowance in other topical reports for the RPS, ECCS, and isolation instrumentation.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. ISTS SR 3.3.3.2.2 has not been retained in proposed Technical Specification 3.3.3.2. CTS 3/4.3.7.4 does not contain a requirement to verify the required control circuits and transfer switches. Thus, this deviation has been made to retain the current licensing basis. As a result, the following surveillance was renumbered, and the Specification was renamed (i.e., Remote Shutdown Monitoring System) to more closely reflect the instrumentation functions addressed.

3.3 INSTRUMENTATION

3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation

<LCO 3.3.4.2>
<DOC A.2>
<Table 3.3.4.2-1>
<LCO 3.2.3>

LCO 3.3.4.1

a. Two channels per trip system for each EOC-RPT instrumentation Function listed below shall be OPERABLE:

1. Turbine Stop Valve (TSV) — Closure, ~~Trip Oil Pressure—Low~~ and

2. Turbine Control Valve (TCV) — Fast Closure, Trip Oil Pressure—Low.

1

OR

~~b.~~ LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for inoperable EOC-RPT as specified in the COLR are made applicable.

2

<Appl 3.3.4.2>
<DOC L.2>
<Appl 3.2.3>

APPLICABILITY: THERMAL POWER ≥ ~~[40]~~ 25 % RTP with any recirculation pump in fast speed.

2

ACTIONS

<DOC A.4>

----------NOTE----------
Separate Condition entry is allowed for each channel.

<3.3.4.2 Act a>
<3.3.4.2 Act b>
<3.3.4.2 Act c>
<3.3.4.2 Act d>
<3.3.4.2 Act e>

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Restore channel to OPERABLE status. OR	72 hours (continued)

<CTS>

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.4.2 Act a> <3.3.4.2 Act b> <3.3.4.2 Act c> <3.3.4.2 Act d> <3.3.4.2 Act e>	A. (continued)	A.2 ---------NOTE--------- Not applicable if inoperable channel is the result of an inoperable breaker. --------------------- Place channel in trip.	72 hours
<3.3.4.2 Act b> <3.3.4.2 Act d> <3.3.4.2 Act d.1> <3.3.4.2 Act e> <3.3.4.2 Act e.1>	B. One or more Functions with EOC-RPT trip capability not maintained. ~~AND~~ 2 ~~MCPR limit for inoperable EOC-RPT not made applicable.~~	B.1 Restore EOC-RPT trip capability. ~~OR~~ ~~B.2 Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR.~~	2 hours ~~2 hours~~ 2
<3.3.4.2 Act d.2> <DOC L.2> <3.3.4.2 Act e.2> <3.2.3 Act b>	C. Required Action and associated Completion Time not met.	C.1 Remove the associated recirculation pump fast speed breaker from service. OR C.2 Reduce THERMAL POWER to < [140]% RTP. 25	4 hours 4 hours 2

SURVEILLANCE REQUIREMENTS

---NOTE---

〈Table 3.3.4.2-1, footnote (a)〉 When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours~~,~~ provided the associated Function maintains EOC-RPT trip capability. 3

	SURVEILLANCE		FREQUENCY
〈4.3.4.2.1〉 〈Table 4.3.4.2.1-1〉	SR 3.3.4.1.1	Perform CHANNEL FUNCTIONAL TEST.	~~[~~92~~]~~ days 2
	~~[SR 3.3.4.1.2~~	~~Calibrate the trip units.~~	~~[92] days]~~ 4
〈4.3.4.2.1〉 〈Table 4.3.4.2.1-1〉 〈Table 4.3.4.2.1-2〉	SR 3.3.4.1.~~3~~ 2 4	Perform CHANNEL CALIBRATION. The Allowable Values shall be: 1 a. TSV - Closure, ~~Trip Oil Pressure—Low~~ 1 ≥ ~~[37] psig~~ ≤ [7%] closed 2 b. TCV Fast Closure, Trip Oil Pressure—Low: ≥ [~~42~~] 424 psig. 2	[~~18~~] months 24 2
〈4.3.4.2.2〉	SR 3.3.4.1.~~4~~ 3 4	Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation.	[~~18~~] months 24 2
〈Table 4.3.4.2.1-1, footnote (a)〉	SR 3.3.4.1.~~5~~ 4	Verify TSV - Closure ~~Trip Oil Pressure—Low~~ 1 and TCV Fast Closure, Trip Oil Pressure—Low Functions are not bypassed when THERMAL POWER is ≥ [~~40~~]% RTP. 25 2	[~~18~~] months 24 2

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
<LCO 3.3.4.2> <4.3.4.2.3> <DOC A.6> <DOC A.7>	SR 3.3.4.1.~~8~~ 5 [4]	------NOTE------ 1. Breaker ~~interruption~~ arc suppression [2] time may be assumed from the most recent performance of SR 3.3.4.1.~~7~~ 6 [4]. 2. The Turbine Stop Valve - Closure Function limit switch response time may be conservatively assumed. [5] ------------------ Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.	~~[18]~~ 24 [2] months on a STAGGERED TEST BASIS
<4.3.4.2.3>	SR 3.3.4.1.~~7~~ 6 [4]	Determine RPT breaker ~~[interruption]~~ arc suppression [2] time.	60 months

1. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. Editorial change made to be consistent with other similar requirements in the ITS or for clarity.

4. The bracketed Surveillance has been deleted since it is not applicable to LaSalle 1 and 2. In addition, the following requirements have been renumbered, where applicable, to reflect this deletion.

5. For the Turbine Stop Valve—Closure Function of EOC-RPT, the response time is measured by installing a test switch in parallel with the limit switch. The test switch simulates the limit switch function, and the response time downstream of the test switch is measured. The response time of the limit switch is assumed to be 10 ms, which is added to the measured response time to obtain the total EOC-RPT Response Time. This method has been previously accepted by the NRC, as documented in a letter from W.G. Guldemond (NRC) to C. Reed (ComEd), dated January 26, 1987. Therefore, Note 2 has been added to ITS SR 3.3.4.1.5 to take an exception to the definition of EOC-RPT Response Time and maintain the current allowance.

<CTS>

3.3 INSTRUMENTATION

3.3.4.2 Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation

<LCO 3.3.4.1>
<Table 3.3.4.1-1>

LCO 3.3.4.2 Two channels per trip system for each ATWS-RPT instrumentation Function listed below shall be OPERABLE:

a. Reactor Vessel Water Level—Low Low, Level 2; and

b. Reactor Steam Dome Pressure—High.

<Appl 3.3.4.1> APPLICABILITY: MODE 1.

ACTIONS

<Doc A.2>

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.4.1 Act a> <3.3.4.1 Act b> <3.3.4.1 Act c> A. One or more channels inoperable.	A.1 Restore channel to OPERABLE status.	14 days.
	OR	
	A.2 ---------NOTE--------- Not applicable if inoperable channel is the result of an inoperable breaker. -------------------- Place channel in trip.	14 days

(continued)

<CTS>

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
<3.3.4.1 Act a> <3.3.4.1 Act d>	B. One Function with ATWS-RPT trip capability not maintained.	B.1	Restore ATWS-RPT trip capability.	72 hours
<3.3.4.1 Act a> <3.3.4.1 Act e>	C. Both Functions with ATWS-RPT trip capability not maintained.	C.1	Restore ATWS-RPT trip capability for one Function.	1 hour
<3.3.4.1 Act d> <3.3.4.1 Act e>	D. Required Action and associated Completion Time not met.	D.1	Remove the associated recirculation pump from service.	6 hours
		OR		
		D.2	Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

<Table 3.3.4.1-1, footnote (a)>

-----NOTE-----
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability.

	SURVEILLANCE		FREQUENCY
<4.3.4.1.1> <Table 4.3.4.1-1>	~~S~~R 3.3.4.2.1	Perform CHANNEL CHECK.	~~12 hours~~ * 2

(continued)

<CTS>

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
<4.3.4.1.1> <Table 4.3.4.1-1>	SR 3.3.4.2.2 Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days 2
	~~SR 3.3.4.2.3 Calibrate the trip units.~~	~~[92] days~~ 3
<4.3.4.1.1> <Table 3.3.4.1-2> <Table 4.3.4.1-1>	SR 3.3.4.2.~~4~~ 3 3 Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Reactor Vessel Water Level—Low Low, Level 2: ≥ ~~[-43.8]~~ -54 inches; and b. Reactor Steam Dome Pressure—High: ≤ ~~[1102]~~ 1147 psig.	~~[18]~~ 24 months 2
<4.3.4.1.2>	SR 3.3.4.2.~~5~~ 4 Perform LOGIC SYSTEM FUNCTIONAL TEST, including breaker actuation.	~~[18]~~ 24 months 2

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.4.2 - ATWS-RPT INSTRUMENTATION

1. Not used.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The bracketed requirement has been deleted since it is not applicable to LaSalle 1 and 2 and the following Surveillances have been renumbered.

<CTS>

3.3 INSTRUMENTATION

3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation

<LCO 3.3.3> LCO 3.3.5.1 The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE.

<Appl 3.3.3> APPLICABILITY: According to Table 3.3.5.1-1.

ACTIONS

---NOTE---

<DOC A.3> Separate Condition entry is allowed for each channel.

<3.3.3 Act a>
<3.3.3 Act b>

<Table 3.3.3-1, Action 30>
<Table 3.3.3-1, Action 33>
<Table 3.3.3-1, Action 35>

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.1-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	B.1 ---NOTES--- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 1.a, 1.b, 2.a and 2.b. --- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND	

(continued)

<CTS>

ACTIONS

<Table 3.3.3-1, Action 30>
<Table 3.3.3-1, Action 33>
<Table 3.3.3-1, Action 35>

<Table 3.3.3-1, Action 32>
<Table 3.3.3-1, Action 34>

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	--------NOTES-------- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 3.a and 3.b. ---------------------	
		Declare High Pressure Core Spray (HPCS) System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	<u>AND</u>		
	B.3	Place channel in trip.	24 hours
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1	--------NOTES-------- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 1.c, ~~1.d,~~ 2.c, and ~~and 2.d~~. --------------------- 1	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	<u>AND</u>		
			(continued)

<CTS>

ACTIONS

<Table 3.3.3-1, Action 34>

<Table 3.3.3-1, Action 32>

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2	Restore channel to OPERABLE status.	24 hours
D. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	D.1	--------NOTE-------- Only applicable if HPCS pump suction is not aligned to the suppression pool. -------------------- Declare HPCS System inoperable.	1 hour from discovery of loss of HPCS initiation capability
	<u>AND</u>		
	D.2.1	Place channel in trip.	24 hours
	<u>OR</u>		
	D.2.2	Align the HPCS pump suction to the suppression pool.	24 hours

3

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<Table 3.3.3-1, Action 31> <Table 3.3.3-1, Action 38> ~~E~~ D 3 . As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	~~E~~ D 3 .1 --------NOTES-------- 1. Only applicable in MODES 1, 2, and 3. 2. Only applicable for Functions 1.d 1.e, 1.f, ~~and~~ 1.g, 2.d 2.~~e~~ and 2.f 1 --------------------- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND 2	
	~~E~~ D 3 .~~2~~ 4 Restore channel to OPERABLE status.	7 days
3 ~~F~~ E . As required by Required Action A.1 and referenced in Table 3.3.5.1-1. <Table 3.3.3-1, Action 30> <Table 3.3.3-1, Action 32> <3.3.3 Act c>	~~F~~ E 3 .1 Declare Automatic Depressurization System (ADS) valves inoperable.	1 hour from discovery of loss of ADS initiation capability in both trip systems
	AND	
		(continued)

AND

D.2 ---- NOTE ----
Only applicable for Functions 1.d and 2.d.

Declare supported feature(s) inoperable. | 24 hours from discovery of loss of initiation capability for feature(s) in one division 1

AND

D.3 ---- NOTE -----
Only applicable for Functions 1.g and 2.f.

Restore channel to OPERABLE status. | 24 hours 2

ACTIONS

<3.3.3 Act c>
<Table 3.3.3-1, Action 30>
<Table 3.3.3-1, Action 32>

<3.3.3 Act c>
<Table 3.3.3-1, Action 32>
<Table 3.3.3-1, Action 34>

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~D~~ E. (continued) $\boxed{3}$	~~D~~ E.2 Place channel in trip.	96 hours from discovery of inoperable channel concurrent with HPCS or reactor core isolation cooling (RCIC) inoperable **AND** 8 days
~~E~~ F. As required by Required Action A.1 and referenced in Table 3.3.5.1-1. $\boxed{3}$	~~E~~ F.1 ---------NOTE--------- Only applicable for Functions 4.c, 4.e, 4.f, 4.g, 5.c, 5.e, and 5.f. -------------------- Declare ADS valves inoperable. **AND**	1 hour from discovery of loss of ADS initiation capability in both trip systems (continued)

<CTS>

ACTIONS

<3.3.3 Act c>
<Table 3.3.3-1, Action 32>
<Table 3.3.3-1, Action 34>

<3.3.3 Act c>
<Table 3.3.3-1, Action 30>
<Table 3.3.3-1, Action 38>

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued) F 3	B.2 F Restore channel to OPERABLE status.	96 hours from discovery of inoperable channel concurrent with HPCS or RCIC inoperable **AND** 8 days
3 G H. Required Action and associated Completion Time of Condition B, C, D, E, F, or G not met.	G H.1 Declare associated supported feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTES-----

<4.3.3.1> 1. Refer to Table 3.3.5.1-1 to determine which SRs apply for each ECCS Function.

<Table 3.3.3-1, footnote (a)> 2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 3.c, 3.f, 3.g, and 3.h; and (b) for up to 6 hours for Functions other than 3.c, 3.f, 3.g, and 3.h, provided the associated Function or the redundant Function maintains ECCS initiation capability. 3

d e f

	SURVEILLANCE	FREQUENCY
<Table 4.3.3.1-1>	SR 3.3.5.1.1 Perform CHANNEL CHECK.	12 hours
<Table 4.3.3.1-1>	SR 3.3.5.1.2 Perform CHANNEL FUNCTIONAL TEST.	~~[~~92~~]~~ days 5
	~~SR 3.3.5.1.3 Calibrate the trip unit.~~	~~[92] days~~ 4
<Table 4.3.3.1-1>	SR 3.3.5.1.~~4~~ 3 4 Perform CHANNEL CALIBRATION.	92 days 5
<Table 4.3.1.1-1>	SR 3.3.5.1.~~5~~ 4 4 Perform CHANNEL CALIBRATION.	~~[18]~~ 24 months 5
<4.3.3.2>	SR 3.3.5.1.~~6~~ 5 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~[18]~~ 24 months 5
	~~SR 3.3.5.1.7 Verify the ECCS RESPONSE TIME is within limits.~~	~~[18] months on a STAGGERED TEST BASIS~~ 6

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Table 3.3.5.1-1 (page 1 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Low Pressure Coolant Injection-A (LPCI) and Low Pressure Core Spray (LPCS) Subsystems					
a. Reactor Vessel Water Level—Low Low Low, Level 1	1,2,3, 4(a),5(a)	~~2~~ 4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 SR 3.3.5.1.~~6~~ 5 ~~SR 3.3.5.1.7~~	≥ ~~[-152.5]~~ -137.0 inches
b. Drywell Pressure—High	1,2,3	~~2~~ 4(b)	B	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 SR 3.3.5.1.~~6~~ 5 ~~SR 3.3.5.1.7~~	≤ ~~[1.44]~~ 1.77 psig
c. LPCI Pump A Start—Time Delay Relay	1,2,3, 4(a),5(a)	~~1~~	C	SR 3.3.5.1.2 ~~SR~~ 3.3.5.1.~~5~~ 3 SR 3.3.5.1.~~6~~ 5	≥ ~~[11] seconds and~~ ≤ ~~[12.25]~~ 10 6 seconds
~~d. Reactor Steam Dome Pressure—Low (Injection Permissive)~~	1,2,3	~~2~~ 2	~~B~~ D	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 SR 3.3.5.1.~~6~~ 5 ~~SR 3.3.5.1.7~~	≥ ~~[412]~~ 490 psig and ≤ ~~[556]~~ 520 psig
	4(a),5(a)	~~2~~ 2	B	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 SR 3.3.5.1.~~6~~ 5 ~~SR 3.3.5.1.7~~	≥ ~~[412]~~ 490 psig and ≤ ~~[556]~~ 520 psig
e. ~~[~~LPCS Pump Discharge Flow—Low (Bypass)~~]~~	1,2,3, 4(a),5(a)	~~1~~	~~E~~ D	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ ~~SR 3.3.5.1.5~~ SR 3.3.5.1.~~6~~ 5	≥ [*] 850 gpm and ≤ [*] 1811 gpm
f. ~~[~~LPCI Pump A Discharge Flow—Low (Bypass)~~]~~	1,2,3, 4(a),5(a)	~~1~~	~~E~~ D	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.3 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.~~6~~ 5	≥ [*] 800 gpm and ≤ [*] 2130 gpm
~~g.~~ h. Manual Initiation	1,2,3, 4(a),5(a)	~~1~~	C	SR 3.3.5.1.~~6~~ 5	NA

(continued)

(a) When associated ECCS subsystem(s) are required to be OPERABLE per LCO 3.5.2, "ECCS—Shutdown."

(b) Also required to initiate the associated ~~[Technical Specifications (TS) required functions]~~ diesel generator (DG).

Insert Function 1.g

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Insert Function 1.g

g.	LPCS and LPCI A Injection Line Pressure—Low (Injection Permissive)	1,2,3	1 per valve	D	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ [490] psig and ≤ [520] psig
		4(a),5(a)	1 per valve	B	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ [490] psig and ≤ [520] psig

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Table 3.3.5.1-1 (page 2 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE 5
2. LPCI B and LPCI C Subsystems		5			
a. Reactor Vessel Water Level — Low Low Low, Level 1	1,2,3, 4(a), 5(a)	~~2~~ (b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≥ ~~[-152.5]~~ -137.0 inches
b. Drywell Pressure — High	1,2,3	~~2~~ (b)	B	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≤ ~~[1.44]~~ 1.77 psig
c. LPCI Pump B Start — Time Delay Relay	1,2,3, 4(a), 5(a)	~~1~~	C	SR 3.3.5.1.2 SR 3.3.5.1.~~5~~ 4 SR 3.3.5.1.~~6~~ 5 4	~~≥ [Y seconds and]~~ 10 3 4 ≤ ~~[5.25]~~ 6 seconds
d. Reactor Steam Dome Pressure — Low (Injection Permissive)	1,2,3	~~[1]~~ 2	~~B~~ D 1	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≥ ~~[452]~~ 490 psig and ≤ ~~[536]~~ 520 psig
	4(a), 5(a)	~~[1]~~ 2	B	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≥ ~~[452]~~ 490 psig and ≤ ~~[536]~~ 520 psig
5 e. ~~[~~LPCI Pump B and LPCI Pump C Discharge Flow — Low (Bypass)~~]~~	1,2,3, 4(a), 5(a)	(2) ~~[1 per pump]~~	3 ~~D~~ E 8	~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 SR 3.3.5.1.3 ~~SR 3.3.5.1.4~~ ~~SR 3.3.5.1.5~~ SR 3.3.5.1.~~6~~ 5 8	≥ [ ] 800 gpm and ≤ [ ] 2130 gpm
~~f.~~ g 2 Manual Initiation	1,2,3, 4(a), 5(a)	~~[2]~~	8 C 4	SR 3.3.5.1.~~6~~ 5 4	NA 5

Insert Function 2.f 2

(continued)

(a) When associated ECCS 9 subsystem(s) are required to be OPERABLE per LCO 3.5.2 9.

(b) Also required to initiate the associated ~~[RHR required function]~~ DG 5.

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Insert Function 2.f

f. LPCI B and LPCI C Injection Line Pressure—Low (Injection Permissive)	1,2,3	1 per valve	D	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ [490] psig and ≤ [520] psig
	4[a],5[a]	1 per valve	B	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ [490] psig and ≤ [520] psig

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Table 3.3.5.1-1 (page 3 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE 5
3. High Pressure Core Spray (HPCS) System		5			
a. Reactor Vessel Water Level — Low Low, Level 2	1,2,3, 4(a), 5(a)	~~4~~ 4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≥ ~~[-43.8]~~ inches -54.0
b. Drywell Pressure — High	1,2,3	~~4~~ 4(b)	B	5 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5 6 ~~SR 3.3.5.1.7~~	≤ ~~[1.44]~~ psig 1.77
c. Reactor Vessel Water Level — High, Level 8	1,2,3, 4(a), 5(a)	~~[2]~~	C	SR 3.3.5.1.1 SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5	≤ ~~[55.7]~~ inches 59.6
~~d. Condensate Storage Tank Level — Low~~	~~1,2,3, 4(c), 5(c)~~	~~[2]~~	~~D~~	~~SR 3.3.5.1.1~~ ~~SR 3.3.5.1.2~~ ~~[SR 3.3.5.1.3]~~ ~~SR 3.3.5.1.5~~ ~~SR 3.3.5.1.6~~	~~≥ [-3] inches~~ 3
~~e. Suppression Pool Water Level — High~~	~~1,2,3~~	~~[2]~~	~~D~~	~~SR 3.3.5.1.1~~ ~~SR 3.3.5.1.2~~ ~~[SR 3.3.5.1.3]~~ ~~SR 3.3.5.1.5~~ ~~SR 3.3.5.1.6~~	~~≤ [7.0] inches~~
3 d ~~f.~~ ~~HPCS~~ Pump Discharge Pressure — High ~~(Bypass)~~ 5	1,2,3, 4(a), 5(a)	~~[1]~~	3 ~~D~~ E	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.~~5~~ 4 4 SR 3.3.5.1.~~6~~ 5	≥ ~~[ ]~~ psig 110
3 e ~~g.~~ ~~HPCS~~ System Flow Rate — Low ~~(Bypass)~~	1,2,3, 4(a), 5(a)	~~[1]~~	3 ~~D~~ E	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 8 SR 3.3.5.1.3 ~~SR 3.3.5.1.3~~ 4 ~~SR 3.3.5.1.5~~ SR 3.3.5.1.~~6~~ 5 4	≥ ~~[ ]~~ gpm and ≤ ~~[ ]~~ gpm 1200 1660
3 f ~~h.~~ Manual Initiation	1,2,3, 4(a), 5(a)	~~[1]~~	C	8 SR 3.3.5.1.~~6~~ 5	NA 5

(continued)

(a) When associated ECCS 9 subsystem(s) are required to be OPERABLE per LCO 3.5.2 9.

(b) Also required to initiate the associated ~~[TS required functions]~~ DG 5.

~~(c) When HPCS is OPERABLE for compliance with LCO 3.5.2, "ECCS — Shutdown," and aligned to the condensate storage tank while tank water level is not within the limit of SR 3.5.2.2.~~ 3

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Table 3.3.5.1-1 (page 4 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Automatic Depressurization System (ADS) Trip System A	(c) 3	5			5
a. Reactor Vessel Water Level — Low Low Low, Level 1	1,2(d),3(d)	~~[2]~~	E F 3	SR 3.3.5.1.1 SR 3.3.5.1.2 ~~SR 3.3.5.1.3~~ 4 SR 3.3.5.1.4 (4) SR 3.3.5.1.5 (5)	≥ [-152.5] inches -137.0
b. Drywell Pressure — High	1,2(d),3(d)	~~[2]~~	E F	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.4 (4) SR 3.3.5.1.5 (5)	≤ [1.44] psig 1.77
c. ADS Initiation Timer	1,2(d),3(d)	~~[1]~~	F G	SR 3.3.5.1.2 SR 3.3.5.1.4 (3) SR 3.3.5.1.5 (5) 4	≤ [117] seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)	1,2(d),3(d)	~~[1]~~	E F 3	SR 3.3.5.1.1 SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.4 (4) SR 3.3.5.1.5 (5)	≥ [10.8] inches 10.9
e. LPCS Pump Discharge Pressure — High	1,2(d),3(d)	~~[2]~~	F G	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.4 (4) SR 3.3.5.1.5 (5)	≥ [125] psig and ≤ [165] psig 136 186
f. LPCI Pump A Discharge Pressure — High	1,2(d),3(d)	~~[2]~~	F G 3	8 ~~SR 3.3.5.1.1~~ SR 3.3.5.1.2 4 ~~SR 3.3.5.1.3~~ SR 3.3.5.1.4 (4) SR 3.3.5.1.5 (5)	≥ [115] psig and ≤ [135] psig 106 156
g. ~~[ADS Bypass]~~ Timer ~~(High Drywell Pressure)~~ 7	1,2(d),3(d)	~~[2]~~	F G	SR 3.3.5.1.2 5 SR 3.3.5.1.4 (3) SR 3.3.5.1.5 (5) 4	≤ [9.4] minutes 9.5
h. Manual Initiation	1,2(d),3(d) (c) 3	~~[2]~~	F G	SR 3.3.5.1.5	NA 5

(continued)

(d) (c) 3 With reactor steam dome pressure > ~~[150]~~ 5 psig.

<CTS>

<Table 3.3.3-1>
<Table 3.3.3-2>
<Table 4.3.3.1-1>

Table 3.3.5.1-1 (page 5 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. ADS Trip System B					
a. Reactor Vessel Water Level — Low Low Low, Level 1	1,2(d),3(d)	2	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ [-152.5] inches -137.0
b. Drywell Pressure — High	1,2(d),3(d)	2	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≤ [1.44] psig 1.77
c. ADS Initiation Timer	1,2(d),3(d)	1	F	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.6	≤ [117] seconds
d. Reactor Vessel Water Level — Low, Level 3 (Confirmatory)	1,2(d),3(d)	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ [10.8] inches 10.9
e. LPCI Pumps B & C Discharge Pressure — High	1,2(d),3(d)	2 per pump (6)	F	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.5 SR 3.3.5.1.6	≥ [115] psig 106 and ≤ [135] psig 156
f. ADS Bypass Timer (High Drywell Pressure)	1,2(d),3(d)	2	F	SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.6	≤ [9.4] minutes 9.5
g. Manual Initiation	1,2(d),3(d) (c)	2	F	SR 3.3.5.1.6	NA

(d) (c) With reactor steam dome pressure > [150] psig.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.5.1 - ECCS INSTRUMENTATION

1. ITS Table 3.3.5.1-1 Function 1.d and 2.d include two Reactor Vessel Pressure channels for each division. Either channel indicating low pressure provides the appropriate permissive signal to open the injection valves in that division. When one of the two channesl is inoperable, the CTS allows 7 days to restore the channels to OPERABLE status. This is acceptable since another channel exists to provide the appropriate permissive signal. When both channels are inoperable, the CTS allows 24 hours to restore a channel to OPERABLE status. The ACTIONS for this Function have been included in ISTS Table 3.3.5.1-1 as ACTION E (ITS ACTION D) instead of ISTS ACTION D (ITS ACTION C), since ISTS 3.3.5.1 Required Action E.2 provides a 7 day restoration time. In addition, a 24 hour restoration time has been provided for when both channels are inoperable (ITS 3.3.5.1 Required Action D.2), consistent with the current licensing basis. ISTS 3.3.5.1 Required Action D.1 Note 2 and the ISTS 3.3.5.1 Required Action D.1 Note have been revised to reflect these changes.

2. Two new ECCS Functions have been added, ITS Functions 1.g and 2.f, which provide permissive signals to the LPCS and LPCI injection valves. Since these new Functions have been added, ISTS 3.3.5.1 Condition E (ITS 3.3.5.1 Condition D) is modified to add new ITS 3.3.5.1 Required Action D.3 to retain the CTS Completion Time for these Functions. This is appropriate so that the similar ITS Functions (1.d, 1.g, 2.d, and 2.f) can be considered together for loss of function consideration. In addition, ISTS Required Action E.1 Note 2 (ITS Required Action D.1 Note 2) has been modified to include these two new Functions, consistent with the intent of ISTS Required Action D.1 Note 2. Finally, the Functions have been renumbered, where applicable, to reflect these additions to retain the CTS Completion Time.

3. ISTS Table 3.3.5.1 Functions 3.d and 3.e have been deleted since they do not apply to the LaSalle 1 and 2 design for HPCS. The associated ACTION D has been deleted. Subsequent ACTIONS, Surveillance Requirements Note 2, and Table Notes have been renumbered, as required.

4. ISTS SR 3.3.5.1.3, the trip unit calibration surveillance, has been deleted consistent with the current licensing basis. Subsequent Surveillances have been renumbered as required.

5. The brackets have been removed and the proper plant specific information/value has been provided.

6. ISTS SR 3.3.5.1.7 has been deleted consistent with the LaSalle 1 and 2 current licensing basis. Deletion of the response time testing requirements for ECCS Instrumentation was approved by the NRC in Amendment Numbers 114 and 99 for LaSalle 1 and 2, respectively. The ECCS Specifications (ITS 3.5.1 and ITS 3.5.2 have been modified to ensure the overall system response time is measured (refer to the Justification for Deviations from NUREG-1434 for ITS: 3.5.1 and ITS: 3.5.2 for further detail).

7. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

8. The appropriate Surveillances have been added/deleted to the ITS Table 3.3.5.1-1 Functions consistent with the current licensing basis.

9. Footnote (a) to ITS Table 3.3.5.1-1 has been modified to only require the ECCS Instrumentation Functions to be Operable when the associated ECCS subsystem(s) are required to be Operable per LCO 3.5.2, "ECCS — Shutdown." Some of the Functions (ITS Table 3.3.5.1-1 Functions 1.a, 1.b, 2.a, 2.b, 3.a, and 3.b) start the DGs in addition to the ECCS subsystems. This is shown in Footnote (b) to Table 3.3.5.1-1. As written, the ISTS implies that these Functions are required to be Operable when the DGs are required, even if the associated ECCS subsystems are not required. During shutdown Modes when the reactor cavity is flooded, the ECCS subsystems are not required to be Operable. Therefore, the ECCS start function of the DGs serve no safety significant support function. As such, these instrument Functions are not required and have been deleted from the ITS when only the DGs are required to be Operable. This change is also consistent with current licensing basis (CTS Table 3.3.3-1 Footnote * only requires these Functions when the system is required to be Operable per CTS 3.5.2 or 3.5.3, the ECCS — Shutdown and Suppression Pool Specifications). The DGs are still required to be started on a loss of power signal, as required in ITS 3.3.8.1.

10. ISTS Table 3.3.5.1-1 Functions 1.c and 2.c require a minimum time for the ECCS pump start time delay relays. The ISTS Bases states that the minimum time is to ensure that excess loading will not cause failure of the power source; i.e., the minimum Allowable Value is chosen to be long enough so that most of the starting transient of the first pump is complete before starting the second pump on the same 4.16 kV emergency bus. Failure of this portion of the instrumentation will result in the DG being inoperable; it does not necessarily result in the inoperability of the ECCS pump. The ECCS analysis assumes the pumps are operating at a certain time; starting the pumps sooner than assumed does not invalidate the ECCS analysis. This requirement is adequately covered by ITS SR 3.8.1.18, which requires the interval between each sequenced load block to be within ± 10% of the design interval for each load sequence time delay relay. The ITS Bases for this SR states that it ensures that a sufficient time interval exists for the DG to restore frequency and voltage prior to applying the next load and that safety analyses assumptions regarding ESF equipment time delays are not violated. Therefore, if a time delay relay actuated too soon such that a power source was affected, the requirements of SR 3.8.1.18 would not be met and the affected DG would be declared inoperable and the ACTIONS of ITS 3.8.1 taken. Therefore, there is no reason to require minimum times in the ECCS Instrumentation Specification. This is also consistent with current licensing basis, which does not have minimum time requirements for the ECCS pump start time delay relays in the ECCS Instrumentation Specification.

<CTS>

3.3 INSTRUMENTATION

3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation

<LCO 3.3.5> LCO 3.3.5.2 The RCIC System instrumentation for each Function in Table 3.3.5.2-1 shall be OPERABLE.

1

<Appl 3.3.5> APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

<DOC A.2>
---------------------------------NOTE---------------------------------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.5 Acta> <3.3.5 Actb> A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.2-1 for the channel.	Immediately
<Table 3.3.5-1, Action 50> B. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	B.1 Declare RCIC System inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of RCIC initiation capability 24 hours
<Table 3.3.5-1, Action 51> <Table 3.3.5-1, Action 52> C. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	C.1 Restore channel to OPERABLE status.	24 hours

(continued)

<CTS>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<DOC M.1> D. As required by Required Action A.1 and referenced in Table 3.3.5.2-1.	D.1 ---------NOTE--------- Only applicable if RCIC pump suction is not aligned to the suppression pool. --------------------- Declare RCIC System inoperable.	1 hour from discovery of loss of RCIC initiation capability
	AND	
	D.2.1 Place channel in trip.	24 hours
	OR	
	D.2.2 Align RCIC pump suction to the suppression pool.	24 hours
E. Required Action and associated Completion Time of Condition B, C, or D not met. <Table 3.3.5-1, Action 50> <Table 3.3.5-1, Action 51> <Table 3.3.5-1, Action 52>	E.1 Declare RCIC System inoperable.	Immediately

<CTS>

SURVEILLANCE REQUIREMENTS

NOTES

<4.3.5.1> 1. Refer to Table 3.3.5.2-1 to determine which SRs apply for each RCIC Function.

<Table 3.3.5-1, footnote (a)> 2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and 5; and (b) for up to 6 hours for Functions 1, 3, and 4 provided the associated Function maintains RCIC initiation capability.

4 2

SURVEILLANCE		FREQUENCY	
<Table 4.3.5.1-1>	SR 3.3.5.2.1 Perform CHANNEL CHECK.	12 hours	
<Table 4.3.5.1-1>	SR 3.3.5.2.2 Perform CHANNEL FUNCTIONAL TEST.	[92] days	1
	~~[SR 3.3.5.2.3 Calibrate the trip units.~~	~~[92] days]~~	2
<Table 4.3.5.1-1>	SR 3.3.5.2.4 3 Perform CHANNEL CALIBRATION.	~~18~~ 24 months	3
<4.3.5.2>	SR 3.3.5.2.5 4 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~[18]~~ 24 months	1

2

<CTS>

<Table 3.3.5-1>
<Table 3.3.5-2>
<Table 4.3.5.1-1>

Table 3.3.5.2-1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level — Low Low, Level 2	~~[4]~~ 1	B	~~SR 3.3.5.2.1~~ 4 SR 3.3.5.2.2 ~~[SR 3.3.5.2.3]~~ SR 3.3.5.2.~~4~~ 3 SR 3.3.5.2.~~5~~ 4 2	≥ ~~[-43.8]~~ -54.0 inches 1
2. Reactor Vessel Water Level — High, Level 8	~~[2]~~ 1	C	SR 3.3.5.2.1 SR 3.3.5.2.2 ~~[SR 3.3.5.2.3]~~ SR 3.3.5.2.~~4~~ 3 SR 3.3.5.2.~~5~~ 4 2	≤ ~~[55.7]~~ 59.6 inches 1
3. Condensate Storage Tank Level — Low	~~[2]~~ 1	D	~~SR 3.3.5.2.1~~ 4 SR 3.3.5.2.2 ~~[SR 3.3.5.2.3]~~ SR 3.3.5.2.~~4~~ 3 SR 3.3.5.2.~~5~~ 4 2	≥ ~~[0]~~ 715 ft 8 inches 1
~~4. Suppression Pool Water Level — High~~	~~[2]~~	~~D~~	~~SR 3.3.5.2.1~~ ~~SR 3.3.5.2.2~~ ~~[SR 3.3.5.2.3]~~ ~~SR 3.3.5.2.4~~ ~~SR 3.3.5.2.5~~	~~≤ [7.0] inches~~ 2
~~5.~~ 4. Manual Initiation 2	~~[1]~~ 1	C	SR 3.3.5.2.~~6~~ 4 2	NA 1

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.5.2 - RCIC SYSTEM INSTRUMENTATION

1. The brackets have been removed and the proper plant specific information/value has been provided.

2. The bracketed Surveillance has been deleted since it is not applicable to LaSalle 1 and 2 current licensing basis and the subsequent Surveillances have been renumbered. In addition, the current LaSalle 1 and 2 design does not include the RCIC Suppression Pool Water Level—High Function (ISTS Table 3.3.5.2-1 Function 4). Therefore, this Function has been deleted and the remaining Function has been renumbered to reflect the deletion.

3. The Channel Calibration Frequency has been changed from 18 months to 24 months, consistent with other channel calibrations changed as part of the ITS conversion.

4. The CHANNEL CHECK Surveillance has not been adopted for these Functions, consistent with current licensing basis.

<CTS>

3.3 INSTRUMENTATION

3.3.6.1 Primary Containment Isolation Instrumentation

LCO 3.3.2

LCO 3.3.6.1 The primary containment isolation instrumentation for each Function in Table 3.3.6.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.1-1.

ACTIONS

-----NOTES-----

<DOC A.2> 1. Separate Condition entry is allowed for each channel. INSERT ACTIONS NOTES 2+3 11

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.2 Act a> <3.3.2 Act b> <3.3.2 Act b.1> <3.3.2 Act c.2.a> A. One or more ~~required~~ 1 channels inoperable.	A.1 Place channel in trip.	12 hours for Functions 2.b, 2.f a 5.a, ~~5.d,~~ ~~and 5.e~~ AND 24 hours for Functions other than Functions 2.b, 2.f a 5.a, ~~5.d,~~ ~~and 5.e~~ 1
<3.3.2 Act a> <3.3.2 Act c> <3.3.2 Act c.1> B. One or more automatic Functions with isolation capability not maintained.	B.1 Restore isolation capability.	1 hour

(continued)

<CTS>

<Table 3.3.2-1>

Insert Notes 2 and 3

<footnote(i)>

2. For Function 1.e, when automatic isolation capability is inoperable for required Reactor Building Ventilation System corrective maintenance, filter changes, damper cycling, or required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 4 hours.

<footnote(j)>

3. For Function 1.e, when automatic isolation capability is inoperable due to loss of reactor building ventilation or for performance of SR 3.6.4.1.3 or SR 3.6.4.1.4, entry into associated Conditions and Required Action may be delayed for up to 12 hours.

<CTS>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.2 Act b.2> <3.3.2 Act c.2.b> C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Enter the Condition referenced in Table 3.3.6.1-1 for the channel.	Immediately
<T 3.3.2-1 Act 20> <T 3.3.2-1 Act 21> D. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	D.1 Isolate associated main steam line (MSL).	12 hours
	<u>OR</u>	
	D.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	D.2.2 Be in MODE 4.	36 hours
<T 3.3.2-1 Act 23> E. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	E.1 Be in MODE 2.	6 hours
<T 3.3.2-1 Act 20> <T 3.3.2-1 Act 22> <T 3.3.2-1 Act 25> F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1 Isolate the affected penetration flow path(s).	1 hour
<T 3.3.2-1 Act 26> G. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	G.1 Isolate the affected penetration flow path(s).	24 hours

(continued)

<CTS>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<T 3.3.2-1 Act 20> <T 3.3.2-1 Act 26> H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. OR Required Action and associated Completion Time of Condition F or G not met. [2]	H.1 Be in MODE 3.	12 hours
	AND	
	H.2 Be in MODE 4.	36 hours
<T 3.3.2-1 Act 22> I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Declare associated standby liquid control subsystem inoperable. (SLC) [2]	1 hour
	OR	
	I.2 Isolate the Reactor Water Cleanup System. (RWCU) [2]	1 hour
<T 3.3.2-1 Act 25> J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Initiate action to restore channel to OPERABLE status.	Immediately
	OR	
	J.2 Initiate action to isolate the Residual Heat Removal (RHR) Shutdown Cooling System. (SDC) [2]	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
K. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	K.1	Isolate the affected penetration flow path(s).	Immediately
	OR		
	K.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	K.2.2	Suspend movement of irradiated fuel assemblies in the [primary and secondary containment].	Immediately
	AND		
	K.2.3	Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately

3

<CTS>

SURVEILLANCE REQUIREMENTS

NOTES

<4.3.2.1> 1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

<T3.3.2-1 fnote (b)> 2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability. 2

	SURVEILLANCE	FREQUENCY
<T4.3.2.1-1>	SR 3.3.6.1.1 Perform CHANNEL CHECK.	12 hours
<T4.3.2.1-1>	SR 3.3.6.1.2 Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days 4
	~~[SR 3.3.6.1.3 Calibrate the trip unit.~~	~~[92] days]~~ 5
<T4.3.2.1-1>	SR 3.3.6.1.~~4~~ 3 5 Perform CHANNEL CALIBRATION.	92 days
<T4.3.2.1-1>	SR 3.3.6.1.~~5~~ 4 5 Perform CHANNEL CALIBRATION.	~~[18]~~ 24 months 4
<4.3.2.2>	SR 3.3.6.1.~~6~~ 5 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~[18]~~ 24 months 4

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
<LCO 3.3.2> <4.3.2.3> <T 3.3.2-3 fnote ##> SR 3.3.6.1.~~7~~ 6 5	~~-----NOTE----- Radiation detectors may be excluded.~~ 6 The sensor response time may be assumed to be the design sensor response time Verify the ISOLATION SYSTEM RESPONSE TIME of the Main Steam Isolation Valves 6 is within limits. ~~Reviewer's Note: This SR is applied only to Functions of Table 3.3.6.1-1 with required response times not corresponding to DG start time.~~ 7	~~[18]~~ 24 4 months on a STAGGERED TEST BASIS

<CTS Table 3.3.2-1>

Table 3.3.6.1-1 (page 1 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation		4			4
a. Reactor Vessel Water Level — Low Low Low, Level 1	1,2,3	~~[2]~~	D	SR 3.3.6.1.1 SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~4~~ 4 SR 3.3.6.1.~~6~~ 5 SR 3.3.6.1.~~7~~ 6 5	≥ ~~[-152.5]~~ -137.0 inches
b. Main Steam Line Pressure — Low	1	~~[2]~~	E	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ ~~SR 3.3.6.1.5~~ 10 SR 3.3.6.1.3 SR 3.3.6.1.~~6~~ 5 SR 3.3.6.1.~~7~~ 6 5	≥ ~~[837]~~ 827 psig
c. Main Steam Line Flow — High	1,2,3	~~[2]~~ per MSL	D	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ ~~SR 3.3.6.1.5~~ 10 SR 3.3.6.1.3 SR 3.3.6.1.~~6~~ 5 SR 3.3.6.1.~~7~~ 6 5	≤ ~~[176.5]~~ 116 psi~~g~~ d 9
d. Condenser Vacuum — Low	1,2[(a)], 3[(a)]	~~[2]~~	D	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~6~~ 4 5 SR 3.3.6.1.~~7~~ 5	≥ ~~[7]~~ 3.8 inches Hg vacuum
8 ~~e. Main Steam Tunnel Temperature — High~~	~~1,2,3~~	~~[8]~~	~~D~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [191]°F~~
8 e ~~f~~. Main Steam Line 9 ~~Tunnel~~ Differential Temperature — High	1,2,3	~~[2]~~	D	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[104]~~ 67 °F
8 f ~~g~~. Manual Initiation	1,2,3	~~[2]~~	G	SR 3.3.6.1.~~8~~ 5 5	NA ~~]~~ 4
2. Primary Containment Isolation					
a. Reactor Vessel Water Level — Low Low, Level 2	1,2,3	~~[2]~~	H	~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~6~~ 4 SR 3.3.6.1.~~7~~ 5 5 10 ~~SR 3.3.6.1.7~~	≥ ~~[-43.8]~~ -54.0 inches

(continued)

(a) With any turbine ~~stop valve~~ 4 not closed.

<CTS Table 3.3.2-1>

Table 3.3.6.1-1 (page 2 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Primary Containment Isolation (continued)					
b. Drywell Pressure – High	1,2,3	~~[2]~~ 4	H	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~[SR 3.3.6.1.3]~~ SR 3.3.6.1.~~5~~ 4 5 SR 3.3.6.1.~~6~~ 5 10 ~~SR 3.3.6.1.7~~	≤ ~~[1.43]~~ 1.93 4 psig
~~c. Reactor Vessel Water Level – Low Low Low, Level 1 (ECCS Divisions 1 and 2)~~	~~1,2,3~~	~~[2]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~ ~~SR 3.3.6.1.7~~	~~≥ [-152.5] inches~~
~~d. Drywell Pressure – High (ECCS Divisions 1 and 2)~~	~~1,2,3~~	~~[2]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~ ~~SR 3.3.6.1.7~~	~~≤ [1.44] psig~~
~~e. Reactor Vessel Water Level – Low Low, Level 2 (HPCS)~~	~~1,2,3~~	~~[4]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~ ~~SR 3.3.6.1.7~~	~~≥ [-43.8] inches~~
~~f. Drywell Pressure – High (HPCS)~~	~~1,2,3~~	~~[4]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~ ~~SR 3.3.6.1.7~~	~~≤ [1.44] psig~~
~~g.~~ c 8. ~~Containment and Drywell~~ Reactor Building 9 Ventilation Exhaust Plenum 9 Radiation-High	1,2,3	~~[2]~~	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 5 SR 3.3.6.1.~~6~~ 5 10 ~~SR 3.3.6.1.7~~	≤ ~~[6.0]~~ 12.9 4 mR/hr

8

(continued)

~~(b) During CORE ALTERATIONS, movement of irradiated fuel assemblies in [primary or secondary containment], or operations with a potential for draining the reactor vessel.~~ 3

Insert Functions 2.d, 2.e, 2.f 8

<CTS>

<Table 3.3.2-1>

Insert 2.d, 2.e, and 2.f

d.	Fuel Pool Ventilation Exhaust Radiation—High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ [15] mR/hr
e.	Reactor Vessel Water Level—Low Low Low, Level 1	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ [-137.0] inches
f.	Reactor Vessel Water Level—Low, Level 3	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ [10.9] inches

<CTS Table 3.3.2-1>

Table 3.3.6.1-1 (page 3 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Primary Containment Isolation (continued)		4			4
	[(b)]	[2]	K	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ [4.0] mR/hr 3
8 9 ~~g.~~ Manual Initiation	1,2,3	~~[2]~~ 1	G	SR 3.3.6.1.~~8~~ 5 5	NA 4
3. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. RCIC Steam Line Flow – High	1,2,3	~~[~~1~~]~~	F	10 ~~SR 3.3.6.1.1~~ 5 SR 3.3.6.1.2 ~~SR 3.3.6.1.3~~ 10 SR 3.3.6.1.3 ~~SR 3.3.6.1.5~~ SR 3.3.6.1.~~6~~ 5 5 10 ~~SR 3.3.6.1.2~~	≤ ~~[64]~~ 169 inches water
9 b. RCIC Steam Line Flow – Time Delay 9 9	~~[~~1,2,3~~]~~ 4	~~[~~1~~]~~	F	SR 3.3.6.1.2 SR 3.3.6.1.~~3~~ 3 SR 3.3.6.1.~~6~~ 5 5	5 ≥ ~~[3]~~ seconds and ≤ ~~[7]~~ seconds 4
c. RCIC Steam Supply ~~Line~~ Pressure – Low 9	1,2,3	~~[1]~~ 2	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5 10 ~~SR 3.3.6.1.7~~	≥ ~~[53]~~ 58.2 psig
d. RCIC Turbine Exhaust Diaphragm Pressure – High	1,2,3	~~[~~2~~]~~	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[20]~~ 24.0 psig
e. RCIC Equipment Room ~~Ambient~~ 9 Temperature – High	1,2,3	~~[~~1~~]~~	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[191]~~ 277 °F
f. RCIC Equipment Room Differential Temperature – High	1,2,3	~~[~~1~~]~~	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[126]~~ 153 °F

(continued)

~~(b) During CORE ALTERATIONS, movement of irradiated fuel assemblies in [primary or secondary containment], or operations with a potential for draining the reactor vessel.~~ 3

⟨CTS Table 3.3.2-1⟩

Table 3.3.6.1-1 (page 4 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. RCIC System Isolation (continued)		4			
g. ~~Main~~ RCIC Steam Line Tunnel ~~Ambient~~ Temperature — High	1,2,3	~~1~~	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[191]~~ 277 °F
h. ~~Main~~ RCIC Steam Line Tunnel Differential Temperature — High	1,2,3	~~1~~	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[84]~~ 153 °F
~~i. Main Steam Line Tunnel Temperature Timer~~	~~1,2,3~~	~~[1]~~	~~F~~	~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.4~~ ~~SR 3.3.6.1.6~~	~~≤ [30] minutes~~
~~j. RHR Equipment Room Ambient Temperature — High~~	~~1,2,3~~	~~[1 per room]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [171] °F~~
~~k. RHR Equipment Room Differential Temperature — High~~	~~1,2,3~~	~~[1 per room]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [102] °F~~
~~l. RCIC/RHR Steam Line Flow — High~~	~~1,2,3~~	~~[1]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [43] inches water~~ 8
~~m.~~ i. Drywell Pressure — High	1,2,3	~~[3]~~ 2	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~[SR 3.3.6.1.3]~~ SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 ~~SR 3.3.6.1.7~~ 5	≤ ~~[1.44]~~ 1.77 psig
8 ~~n.~~ j. Manual Initiation	1,2,3	~~[2]~~ 1(b)	G	SR 3.3.6.1.~~6~~ 5	NA 4
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Differential Flow — High	1,2,3	~~1~~	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5 10 ~~SR 3.3.6.1.7~~	≤ ~~[69]~~ 85 gpm
b. Differential Flow — Timer	1,2,3	~~1~~	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[47]~~ 46 seconds

(continued)

(b) Only inputs into one of two trip systems. 4

<CTS Table 3.3.2-1>

Table 3.3.6.1-1 (page 5 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE [4]
4. RWCU System Isolation (continued)					
c. RWCU Heat Exchanger ~~Equipment Room~~ Areas [9] Temperature-High	1,2,3	~~1~~ 1 per area [4]	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 157 °F
d. RWCU Heat Exchanger ~~Equipment Room~~ Areas Ventilation Differential Temperature – High	1,2,3	~~1~~ 1 per area	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 39 °F
e. RWCU Pump ~~Room~~ and Valve Area [9] Temperature – High	1,2,3	~~1~~ 1 per ~~room~~ area	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 209 °F
f. RWCU Pump ~~Room~~ and Valve Area Differential Temperature – High	1,2,3	~~1~~ 1 per ~~room~~ area	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 91 °F
g. RWCU ~~Valve/Heat Room~~ Holdup Pipe Area [9] Temperature – High	1,2,3	~~1~~ 1	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 209 °F
h. RWCU ~~Valve/Heat Room~~ Holdup Pipe Area Ventilation [9] Differential Temperature – High	1,2,3	~~1~~ 1	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 91 °F
i. ~~Main Steam Line Tunnel Ambient~~ RWCU Filter/Demineralizer Valve Room Area Temperature – High	1,2,3	~~1~~ 1	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 209 °F
j. ~~Main Steam Line Tunnel~~ RWCU Filter/Demineralizer Valve Room Area Ventilation [9] Differential Temperature – High	1,2,3	~~1~~ 1	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 [5]	≤ ~~[illegible]~~ 91 °F
k. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	~~2~~ 2(b) [9]	F	[10] ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 [5] ~~SR 3.3.6.1.3~~ SR 3.3.6.1.~~5~~ 4 [5] SR 3.3.6.1.~~6~~ 5 [10] ~~SR 3.3.6.1.7~~	≥ ~~[illegible]~~ -54.0 inches
l. Standby Liquid Control System Initiation	1,2	~~2~~ 2(b)	I	SR 3.3.6.1.~~6~~ 5 [6]	NA
~~m. Manual Initiation~~	~~1,2,3~~	~~2~~ 1	~~G~~	~~SR 3.3.6.1.6~~	~~NA~~ [47]

(continued)

(b) Only inputs into one of two trip systems. [4]

<CTS Table 3.3.2-1>

Table 3.3.6.1-1 (page 6 of 6)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
RHR 9 5. Shutdown Cooling System Isolation					
~~a. RHR Equipment Room Ambient Temperature – High~~	~~2,3~~	~~[1 per room]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [171] °F~~ 8
~~b. RHR Equipment Room Differential Temperature – High~~	~~2,3~~	~~[1 per room]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [102] °F~~
~~c.~~ a 8 Reactor Vessel Water Level – Low, Level 3	3,4,5	~~[2]~~ 4 2[(c)]	J	SR 3.3.6.1.1 SR 3.3.6.1.2 ~~[SR 3.3.6.1.3]~~ 10 SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5 ~~SR 3.3.6.1.7~~	≥ ~~[10.8]~~ 10.9 4 inches
~~d.~~ b Reactor ~~Steam Dome~~ Vessel 9 Pressure – High	1,2,3	~~[2]~~ 1	F	10 ~~SR 3.3.6.1.1~~ SR 3.3.6.1.2 5 ~~[SR 3.3.6.1.3]~~ SR 3.3.6.1.~~5~~ 4 SR 3.3.6.1.~~6~~ 5 5	≤ ~~[150]~~ 142 psig
~~e. Drywell Pressure – High~~	~~1,2,3~~	~~[2]~~	~~F~~	~~SR 3.3.6.1.1~~ ~~SR 3.3.6.1.2~~ ~~[SR 3.3.6.1.3]~~ ~~SR 3.3.6.1.5~~ ~~SR 3.3.6.1.6~~	~~≤ [1.43] psig~~ B
e. Manual Initiation	1,2,3	1	G	SR 3.3.6.1.5	B

(c) Only one trip system required in MODES 4 and 5 with RHR Shutdown Cooling System integrity maintained.

1. The proper Primary Containment Isolation Functions that are common to the RPS Instrumentation have been provided. In addition, since all installed primary containment isolation channels required by this LCO are listed in Table 3.3.6.1-1, the word "required" is not needed in Condition A.

2. Editorial change made to be consistent with other similar requirements in the ITS or for clarity.

3. The Reactor Building Ventilation Exhaust Plenum Radiation — High Function (ITS Table 3.3.6.1-1 Function 2.c, ISTS Table 3.3.6.1-1 Function 2.g) is not currently required nor needed for primary containment isolation in MODES other than MODES 1, 2, and 3. Therefore, this requirement (ISTS Table 3.3.6.1-1 Note (b)) has been deleted. The associated ACTION (ISTS ACTION K) has also been deleted.

4. The brackets have been removed and the proper plant specific information/value has been provided.

5. The current LaSalle 1 and 2 Licensing Basis does not require a trip unit calibration to be performed every 92 days. Therefore, ISTS SR 3.3.6.1.3 has been deleted. Subsequent Surveillance Requirements have been renumbered, where applicable.

6. A Note has been added to ITS SR 3.3.6.1.6 to exempt measuring the sensor response times, for Functions 1.a, 1.b, and 1.c (Main Steam Line (MSL) Isolation Reactor Vessel Water Level — Low Low Low, Level 1, Main Steam Line Pressure — Low, and Main Steam Line Flow — High Functions). Deletion of the response time testing for these sensors was evaluated in NEDO-32291, "System Analyses for Elimination of Selected Response Time Testing Requirements," January 1994, and was determined acceptable since other Technical Specification Surveillances (CHANNEL CALIBRATION, CHANNEL FUNCTIONAL TEST, CHANNEL CHECK, and LOGIC SYSTEM FUNCTIONAL TEST) ensure that instrumentation response times are within acceptable limits. These other tests are normally sufficient to identify failure modes or degradation in sensor response time and assure operation of the analyzed instrument loops within acceptable limits. Furthermore, there are no known failure modes that can be detected by response time testing that cannot also be detected by other Technical Specification Surveillances. These changes are consistent with the LaSalle 1 and 2 currently licensing basis. Deletion of the response time testing for these sensors was approved by the NRC in Amendments 114 and 99 for LaSalle 1 and 2, respectively.

6. (continued)

Also, the original Note in ISTS SR 3.3.6.1.7 has been deleted since there are no response time requirements on Functions with radiation detectors. In addition, since only the instruments that affect MSIV isolation are required to be tested, as identified in CTS Table 3.3.2-3 footnote #, ISTS SR 3.3.6.1.7 (ITS SR 3.3.6.1.6) has been modified to clearly state the Isolation System Response Time test is applicable only to the MSIVs.

7. This Reviewer's Note has been deleted and the appropriate Functions now include this SR requirement, consistent with the Note and the LaSalle 1 and 2 current licensing basis. The Note is not meant to be retained in the final version of the plant specific submittal.

8. Four new Primary Containment Isolation Functions have been added (ITS Table 3.3.6.1-1 Functions 2,d, 2,e, 2,f, and 5.c, consistent with current LaSalle 1 and 2 Licensing Basis. In addition, 12 Functions have been deleted (ISTS Table 3.3.6.1-1 Functions 1.e, 2.c, 2.d, 2.e, 2.f, 3.i, 3.j, 3.k, 3.l, 5.a, 5.b, and 5.e) since they are not applicable to LaSalle 1 and 2. The Functions have been renumbered where applicable, to reflect these additions and deletions.

9. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

10. The SRs associated with each Table 3.3.6.1-1 Function have been modified to reflect the current licensing requirements.

11. These ACTIONS Notes have been added to allow the associated testing or corrective maintenance to be performed that requires rendering the associated equipment inoperable. This is necessary to eliminate an unnecessary isolation which may result during these activities. This change is consistent with current allowances.

3.3 INSTRUMENTATION

3.3.6.2 Secondary Containment Isolation Instrumentation

<LCO 3.3.2> LCO 3.3.6.2 The secondary containment isolation instrumentation for each Function in Table 3.3.6.2-1 shall be OPERABLE.

<Appl 3.3.2> APPLICABILITY: According to Table 3.3.6.2-1.

ACTIONS

------------------------------------NOTE------------------------------------

<DOC A.3> Separate Condition entry is allowed for each channel.

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.2 Act c> <3.3.2 Act b> <3.3.2 Act b.1> <3.3.2 Act c.2.a>	A. One or more channels inoperable.	A.1 Place channel in trip.	12 hours for Function 2 <u>AND</u> 24 hours for Functions other than Function 2
<3.3.2 Act c.1> <3.3.2 Act c.1, footnote ***>	B. One or more automatic Functions with secondary containment [1] isolation capability not maintained.	B.1 Restore secondary containment [1] isolation capability.	1 hour
<3.3.2 Act b.2> <3.3.2 Act c.2.b> <3.3.2 Act c.1, footnote ***> <Table 3.3.2-1, Action 24> <Table 3.3.2-1, Action 26>	C. Required Action and associated Completion Time of Condition A or B [1] not met.	C.1.1 Isolate the associated penetration flow path(s). <u>OR</u>	1 hour (continued)

<CTS>

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
⟨Table 3.3.2-1, Act 24⟩ ⟨Table 3.3.2-1, Act 26⟩	C. (continued)	C.1.2	Declare associated secondary containment isolation valve(s) 1 inoperable.	1 hour
		AND		
		C.2.1	Place the associated standby gas treatment (SGT) subsystem(s) in operation.	1 hour
		OR		
		C.2.2	Declare associated SGT subsystem(s) 1 inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

------------------------------------NOTES------------------------------------

⟨4.3.2.1⟩ 1. Refer to Table 3.3.6.2-1 to determine which SRs apply for each Secondary Containment Isolation Function.

⟨Table 3.3.2-1, footnote (b)⟩ 2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains secondary containment isolation capability.

1

	SURVEILLANCE		FREQUENCY
⟨Table 4.3.2.1-1⟩	SR 3.3.6.2.1	Perform CHANNEL CHECK.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
<Table 4.3.2.1-1>	SR 3.3.6.2.2 Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days	2
	~~[SR 3.3.6.2.3 Calibrate the trip unit.~~	~~[92] days]~~	3
<Table 4.3.2.1-1>	SR 3.3.6.2.~~4~~ 3 Perform CHANNEL CALIBRATION.	~~[18]~~ 24 months	2
<4.3.2.2> <4.6.5.3.d.2>	SR 3.3.6.2.~~5~~ 4 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~[18]~~ 24 months	2
	~~SR 3.3.6.2.6 [---NOTE--- Radiation detectors may be excluded. ---] Verify the ISOLATION SYSTEM RESPONSE TIME is within limits. [Reviewer's Note: This SR is applied only to Functions of Table 3.3.6.2-1 with required response times not corresponding to DG start time.]~~	~~[18] months on a STAGGERED TEST BASIS~~	5

<CTS>

<Table 3.3.2-1>
<Table 3.3.3-2>
<Table 4.3.2.1-1>

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES AND OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level — Low Low, Level 2	1,2,3,~~(a)~~	~~2~~	~~SR 3.3.6.2.1~~ SR 3.3.6.2.2 ~~SR 3.3.6.2.3~~ SR 3.3.6.2.~~4~~ 3 SR 3.3.6.2.~~5~~ 4 ~~SR 3.3.6.2.6~~	≥ ~~[-43.8]~~ -54.0 inches
2. Drywell Pressure — High	1,2,3	~~2~~	~~SR 3.3.6.2.1~~ SR 3.3.6.2.2 ~~SR 3.3.6.2.3~~ SR 3.3.6.2.~~4~~ 3 SR 3.3.6.2.~~5~~ 4 ~~SR 3.3.6.2.6~~	≤ ~~[1.43]~~ 1.93 psig
3. ~~Fuel Handling Area~~ Reactor Building Ventilation Exhaust Plenum Radiation — High ~~High~~	1,2,3,~~(a),(b)~~	~~2~~	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.~~4~~ 3 SR 3.3.6.2.~~5~~ 4 ~~SR 3.3.6.2.6~~	≤ ~~[6.0]~~ 12.9 mR/hr
4. Fuel ~~Handling Area~~ Pool ~~Sweep~~ Ventilation Exhaust Radiation — High ~~High~~	1,2,3,~~(a),(b)~~	~~2~~	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.~~4~~ 3 SR 3.3.6.2.~~5~~ 4 ~~SR 3.3.6.2.6~~	≤ ~~[?]~~ 15 mR/hr
~~5. Manual Initiation~~	~~1,2,3,(a),(b)~~	~~1 per group~~	~~SR 3.3.6.2.5~~ 4	~~NA~~

(a) During operations with a potential for draining the reactor vessel.

(b) During ~~[~~CORE ALTERATIONS, and during~~]~~ movement of irradiated fuel assemblies in the ~~[primary or]~~ secondary containment~~]~~.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.6.2 - SECONDARY CONTAINMENT ISOLATION INSTRUMENTATION

1. Editorial change made to be consistent with other similar requirements in the ITS or for clarity.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The current LaSalle 1 and 2 licensing basis does not require a trip unit calibration to be performed every 92 days. Therefore ISTS SR 3.3.6.2.3 has been deleted and the subsequent Surveillances have been renumbered. The CHANNEL FUNCTIONAL TEST every 92 days and a CHANNEL CALIBRATION on an 18 month Frequency are currently required. These SRs and frequencies have proven to be more than adequate to ensure OPERABILITY during the cycle. (The calibration is proposed to be extended to 24 months. See Discussion of Changes).

4. Not used.

5. The Reviewer's Note states that ISTS SR 3.3.6.2.6 only applies to Functions with required response times not corresponding to the DG start time. For the Secondary Containment Isolation Instrumentation Functions, there are no appropriate Functions (as shown in CTS Table 3.3.2-3). Therefore, the entire ISTS SR 3.3.6.2.6 has been deleted.

6. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

7. The SRs associated with each Table 3.3.6.2-1 Function have been modified to reflect current licensing basis requirements.

[1]

3.3 INSTRUMENTATION

3.3.6.3 Residual Heat Removal (RHR) Containment Spray System Instrumentation

LCO 3.3.6.3 The RHR Containment Spray System instrumentation for each Function in Table 3.3.6.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.6.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.6.3-1.	B.1 Declare associated RHR containment spray subsystem inoperable. AND B.2 Place channel in trip.	1 hour from discovery of loss of RHR containment spray initiation capability in both trip systems 24 hours

(continued)

1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.6.3-1.	C.1	---------NOTE--------- Only applicable for Functions 2 and 4. --------------------- Declare associated RHR containment spray subsystem inoperable.	1 hour from discovery of loss of RHR containment spray initiation capability in both trip systems
	<u>AND</u>		
	C.2	Restore channel to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition B or C not met.	D.1	Declare associated RHR containment spray subsystem inoperable.	Immediately

1

SURVEILLANCE REQUIREMENTS

---NOTES---

1. Refer to Table 3.3.6.3-1 to determine which SRs apply for each RHR Containment Spray System Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RHR containment spray initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.3.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.3.2	Perform CHANNEL FUNCTIONAL TEST.	[92] days
SR 3.3.6.3.3	Calibrate the trip unit.	[92] days
SR 3.3.6.3.4	Perform CHANNEL CALIBRATION.	92 days
SR 3.3.6.3.5	Perform CHANNEL CALIBRATION.	[18] months
SR 3.3.6.3.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	[18] months

1

Table 3.3.6.3-1 (page 1 of 1)
RHR Containment Spray System Instrumentation

FUNCTION	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Drywell Pressure — High	[2]	B	SR 3.3.6.3.1 SR 3.3.6.3.2 [SR 3.3.6.3.3] SR 3.3.6.3.5 SR 3.3.6.3.6	≤ [1.44] psig
2. Containment Pressure — High	[1]	C	SR 3.3.6.3.1 SR 3.3.6.3.2 [SR 3.3.6.3.3] SR 3.3.6.3.5 SR 3.3.6.3.6	≤ [8.34] psig
3. Reactor Vessel Water Level — Low Low Low, Level 1	[2]	B	SR 3.3.6.3.1 SR 3.3.6.3.2 [SR 3.3.6.3.3] SR 3.3.6.3.5 SR 3.3.6.3.6	≥ [-152.5] inches
4. System A and System B Timers	[1]	C	SR 3.3.6.3.2 [SR 3.3.6.3.4] SR 3.3.6.3.6	≥ [10.26] minutes and ≤ [11.44] minutes
5. Manual Initiation	[1]	C	SR 3.3.6.3.6	NA

1. This Specification has been deleted since the LaSalle 1 and 2 RHR Drywell Spray System is manually actuated using RHR System pump and valve controls. This is consistent with current licensing basis.

1

3.3 INSTRUMENTATION

3.3.6.4 Suppression Pool Makeup (SPMU) System Instrumentation

LCO 3.3.6.4 The SPMU System instrumentation for each Function in Table 3.3.6.4-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.6.4-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.6.4-1.	B.1 Declare associated SPMU subsystem inoperable.	1 hour from discovery of loss of SPMU initiation capability in both trip systems
	<u>AND</u>	
	B.2 Place channel in trip.	24 hours

(continued)

1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.6.4-1.	C.1	---------NOTE--------- Only applicable for Functions 3 and 6. ---------------------- Declare associated SPMU subsystem inoperable.	1 hour from discovery of loss of SPMU initiation capability in both trip systems
	<u>AND</u>		
	C.2	Restore channel to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition B or C not met.	D.1	Declare associated SPMU subsystem inoperable.	Immediately

[1]

SURVEILLANCE REQUIREMENTS

NOTES

1. Refer to Table 3.3.6.4-1 to determine which SRs apply for each SPMU Function.
2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains SPMU initiation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.4.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.4.2	Perform CHANNEL FUNCTIONAL TEST.	[92] days
[SR 3.3.6.4.3	Calibrate the trip unit.	[92] days]
[SR 3.3.6.4.4	Perform CHANNEL CALIBRATION.	92 days]
SR 3.3.6.4.5	Perform CHANNEL CALIBRATION.	[18] months
SR 3.3.6.4.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	[18] months

1

Table 3.3.6.4-1 (page 1 of 1)
Suppression Pool Makeup System Instrumentation

FUNCTION	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Drywell Pressure — High	[2]	B	SR 3.3.6.4.1 SR 3.3.6.4.2 [SR 3.3.6.4.3] SR 3.3.6.4.5 SR 3.3.6.4.6	≤ [1.44] psig
2. Reactor Vessel Water Level — Low Low Low, Level 1	[2]	B	SR 3.3.6.4.1 SR 3.3.6.4.2 [SR 3.3.6.4.3] SR 3.3.6.4.5 SR 3.3.6.4.6	≥ [-152.5] inches
3. Suppression Pool Water Level — Low Low	[1]	C	SR 3.3.6.4.1 SR 3.3.6.4.2 [SR 3.3.6.4.3] SR 3.3.6.4.5 SR 3.3.6.4.6	≥ [17 ft 2 inches]
4. Drywell Pressure — High	[2]	B	SR 3.3.6.4.1 SR 3.3.6.4.2 [SR 3.3.6.4.3] SR 3.3.6.4.5 SR 3.3.6.4.6	≤ [1.43] psig
5. Reactor Vessel Water Level — Low Low, Level 2	[2]	B	SR 3.3.6.4.1 SR 3.3.6.4.2 [SR 3.3.6.4.3] SR 3.3.6.4.5 SR 3.3.6.4.6	≥ [-43.8] inches
6. Timer	[1]	C	SR 3.3.6.4.2 [SR 3.3.6.4.4] SR 3.3.6.4.6	≤ [29.5] minutes
7. Manual Initiation	[2]	C	SR 3.3.6.4.6	NA

1. This Specification has been deleted since the LaSalle 1 and 2 SPMU is manually actuated. This is consistent with current licensing basis.

1

3.3 INSTRUMENTATION

3.3.6.5 Relief and Low-Low Set (LLS) Instrumentation

LCO 3.3.6.5 Two relief and LLS instrumentation trip systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One trip system inoperable.	A.1 Restore trip system to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. OR Two trip systems inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

1

SURVEILLANCE REQUIREMENTS

---------------------------------------NOTE---------------------------------------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains LLS or relief initiation capability, as applicable.

SURVEILLANCE		FREQUENCY
SR 3.3.6.5.1	Perform CHANNEL FUNCTIONAL TEST.	[92] days
[SR 3.3.6.5.2	Calibrate the trip unit.	[92] days]
SR 3.3.6.5.3	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Relief Function Low: 1103 ± 15 psig Medium: 1113 ± 15 psig High: 1123 ± 15 psig b. LLS Function Low open: 1033 ± 15 psig close: 926 ± 15 psig Medium open: 1073 ± 15 psig close: 936 ± 15 psig High open: 1113 ± 15 psig close: 946 ± 15 psig	[18] months
SR 3.3.6.5.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	[18] months

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ISTS: 3.3.6.5 - RELIEF AND LLS INSTRUMENTATION

1. The current LaSalle 1 and 2 licensing basis does not include Technical Specification requirements for the relief mode of the S/RVs since the overpressure protection analysis does not assume the relief mode functions to mitigate an overpressurization event. The LaSalle 1 and 2 analyses also do not take credit for the LLS mode of the S/RVs. Therefore, this Specification has been deleted.

[2] Two channels per trip system for the Control Room Air Intake Radiation-High Function

<CTS>

Area Filtration (CRAF) [1]

3.3 INSTRUMENTATION

3.3.7.1 Control Room ~~Fresh Air (CRFA)~~ System Instrumentation

<LCO 3.3.7.1> <T3.3.7.1-1> LCO 3.3.7.1 ~~The [CRFA] System instrumentation for each Function in Table 3.3.7.1-1~~ shall be OPERABLE for each CRAF subsystem. [2]

<Appl 3.3.7.1> <T 3.3.7.1-1> APPLICABILITY: ~~According to Table 3.3.7.1-1~~.

[2] MODES 1, 2, and 3.
During movement of irradiated fuel assemblies in the secondary containment.
During CORE ALTERATIONS.
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

<DOC A.3>

-----NOTE-----
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One or more required channels inoperable.~~	~~A.1 Enter the Condition referenced in Table 3.3.7.1-1 for the channel.~~	~~Immediately~~ [2]
~~[B. As required by Required Action A.1 and referenced in Table 3.3.7.1-1.~~	~~B.1 Declare associated [CRFA] subsystem inoperable.~~ AND ~~B.2 Place channel in trip.~~	~~1 hour from discovery of loss of [CRFA] initiation capability in both trip systems~~ ~~24 hours]~~ [2]

(continued)

<CTS>

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
~~C. As required by Required Action A.1 and referenced in Table 3.3.7.1-1.~~	~~C.1~~	~~Declare associated [CRFA] subsystem inoperable.~~	~~1 hour from discovery of loss of [CRFA] initiation capability in both trip systems~~ 2
	~~AND~~		
	~~C.2~~	~~Place channel in trip.~~	~~12 hours~~
<3.3.7.1 Act a> <3.3.7.1 Act b> <T 3.3.7.1 Act 70 a> <T 3.3.7.1 Act 70.b> ~~D.~~ A. ~~As required by Required Action A.1 and referenced in Table 3.3.7.1-1.~~ One or more channels inoperable. 2	~~D.1~~ A.1 2	Declare associated ~~[CRFA]~~ CRAF subsystem inoperable. 1	1 hour from discovery of loss of ~~[CRFA]~~ CRAF subsystem initiation capability ~~in both trip systems~~ 4
	AND		
	~~D.2~~ A.2 2	Place channel in trip.	6 hours
<T 3.3.7.1 Act 70.b> <T 3.3.7.1 Act 70.c> ~~E.~~ B. 2 Required Action and associated Completion Time ~~of Condition B, C, or D~~ not met.	~~E.1~~ B.1 2	~~-------NOTE-------- Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. -------------------~~ 3	
		Place the associated ~~[CRFA]~~ CRAF 1 subsystem in the ~~[isolation]~~ pressurization 1 mode of operation.	1 hour
	OR		
			(continued)

<CTS>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<T 3.3.7.1-1 Act 70.b> <T 3.3.7.1-1 Act 70.c> ~~D~~ B 2. (continued)	~~D~~ B 2.2 Declare associated ~~CRPA~~ CRAF 1 subsystem inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

-----NOTE~~S~~ 2-----

<T 3.3.7.1-1 fnote**>

~~1. Refer to Table 3.3.7.1-1 to determine which SRs apply for each Function.~~ 2

~~2.~~ When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ~~CRPA~~ CRAF subsystem 4 initiation capability.

SURVEILLANCE	FREQUENCY
<4.3.7.1> <T 4.3.7.1-1> SR 3.3.7.1.1 Perform CHANNEL CHECK.	12 hours
<4.3.7.1> <T 4.3.7.1-1> SR 3.3.7.1.2 Perform CHANNEL FUNCTIONAL TEST.	~~[92]~~ days 1
~~[SR 3.3.7.1.3 Calibrate the trip units.~~	~~[92] days]~~ 5
<4.3.7.1> <T 3.3.7.1-1> <T 4.3.7.1-1> SR 3.3.7.1.~~4~~ 3 5 Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ [3.5] mR/hr. 2	[~~18~~ 24] months 1
<4.7.2.d.2> SR 3.3.7.1.~~5~~ 4 5 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~[18]~~ 24 months 1

Table 3.3.7.1-1 (page 1 of 1)
[Control Room Fresh Air] System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
[1. Reactor Vessel Water Level — Low Low, Level 2	1,2,3, [(a)]	[2]	B	SR 3.3.7.1.1 SR 3.3.7.1.2 [SR 3.3.7.1.3] SR 3.3.7.1.4 SR 3.3.7.1.5	≥ [-43.8] inches]
[2. Drywell Pressure — High	1,2,3	[2]	C	SR 3.3.7.1.1 SR 3.3.7.1.2 [SR 3.3.7.1.3] SR 3.3.7.1.4 SR 3.3.7.1.5	≤ [1.43] psig]
3. Control Room Ventilation Radiation Monitors	1,2,3, (a),(b)	[2]	D	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.4 SR 3.3.7.1.5	≤ [5] mR/hr

(a) During operations with a potential for draining the reactor vessel.

(b) During [CORE ALTERATIONS, and during] movement of irradiated fuel assemblies in the [primary or secondary containment].

2

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.7.1 - CRAF SYSTEM INSTRUMENTATION

1. The brackets have been removed and the proper plant specific information/value has been provided.

2. The LaSalle 1 and 2 CRAF System Instrumentation includes only one Trip Function. Therefore, the ISTS LCO, Applicability, Actions, and Surveillance Requirement Notes have been modified, as required, to reflect the plant specific design. ISTS Table 3.3.7.1-1 has been deleted and the explicit channel requirements have been included in the LCO, while the "Allowable Value" is incorporated in the SR.

3. The LaSalle 1 and 2 design of the CRAF System does not include a toxic gas mode; therefore, this Note has been deleted.

4. The Completion Time of ISTS 3.3.7.1 Required Action C.1 (ITS 3.3.7.1 Required Action A.1) is 1 hour from discovery of loss of [CRFA] initiation capability in both trip systems. This Completion Time has been modified to be 1 hour from discovery of loss of CRAF subsystem initiation capability. This change reflects plant design in that both trip systems in a unit's intake initiate only one of the two CRAF subsystems. In addition, this is consistent with ISTS 3.3.7.1 Surveillance Requirement Note 2 (ITS 3.3.7.1 Surveillance Requirements Note).

5. This Surveillance Requirement has been deleted, consistent with the LaSalle 1 and 2 current licensing basis and subsequent Surveillance Requirements have been renumbered.

<CTS>

3.3 INSTRUMENTATION

3.3.8.1 Loss of Power (LOP) Instrumentation

<LCO 3.3.3> LCO 3.3.8.1 The LOP instrumentation for each Function in Table 3.3.8.1-1 shall be OPERABLE.

<Appl 3.3.3>
<T 3.3.3-1> APPLICABILITY: MODES 1, 2, and 3,
When the associated diesel generator (DG) is required to be OPERABLE by LCO 3.8.2, "AC Sources—Shutdown."

ACTIONS

<DOC A.4>

-----NOTE-----
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<3.3.3 Act a> <3.3.3 Act b> <T 3.3.3-1 Act 37> A. One or more channels inoperable.	A.1 Place channel in trip.	1 hour
<T 3.3.3-1 Act 37> B. Required Action and associated Completion Time not met.	B.1 Declare associated DG inoperable.	Immediately

<CTS>

SURVEILLANCE REQUIREMENTS

-----NOTES-----

<4.3.3.1>

1. Refer to Table 3.3.8.1-1 to determine which SRs apply for each LOP Function.

<T3.3.3-1 fnote (d)>

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains ~~EG~~ LOP [1] initiation capability.

	SURVEILLANCE	FREQUENCY
[2]	~~SR 3.3.8.1.1 Perform CHANNEL CHECK.~~	~~12 hours~~
<T4.3.3.1-1>	SR 3.3.8.1.~~2~~ 1 Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ 24 months [3]
<T4.3.3.1-1>	SR 3.3.8.1.~~3~~ 2 [2] Perform CHANNEL CALIBRATION.	~~18~~ 24 months [2]
<4.3.3.2>	SR 3.3.8.1.~~4~~ 3 Perform LOGIC SYSTEM FUNCTIONAL TEST.	~~18~~ 24 months [2]

<CTS>
<T 3.3.3-1>
<T 3.3.3-2>
<T4.3.3.1-1>

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION 1	REQUIRED CHANNELS PER DIVISION 2	SURVEILLANCE REQUIREMENTS 2	ALLOWABLE VALUE 2
1. Divisions 1 and 2 — 4.16 kV Emergency Bus Undervoltage			
a. Loss of Voltage — 4.16 kV ~~Basis~~ and time delay	~~[4]~~ 2	~~[SR 3.3.8.1.1]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[2621]~~ 2363 V and ≤ ~~[2912]~~ 2887 V with ≤[11] seconds time delay and 1
~~b. Loss of Voltage — Time Delay~~	~~[4]~~	~~[SR 3.3.8.1.2]~~ ~~SR 3.3.8.1.3~~ ~~SR 3.3.8.1.4~~	~~≥ [0.4] seconds and ≤ [1.0] seconds~~ ≥[2246] V and ≤[2746] V with ≥[5] seconds time delay
~~c~~ b. Degraded Voltage — 4.16 kV ~~Basis~~	~~[4]~~ 2	~~[SR 3.3.8.1.1]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[3744]~~ 3814 V and ≤ ~~[3837.6]~~ 3900 V
d. Degraded Voltage — Time Delay, LOCA	~~[4]~~ 2	~~[SR 3.3.8.1.2]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[illegible]~~ 9 seconds and ≤ ~~[illegible]~~ 11 seconds
c. Degraded Voltage - Time Delay, No LOCA	2	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	≥[4.5] minutes and ≤[5.5] minutes 2
2. Division 3 — 4.16 kV Emergency Bus Undervoltage			
a. Loss of Voltage — 4.16 kV ~~Basis~~	~~[4]~~ 2	~~[SR 3.3.8.1.1]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[2984]~~ [2583] V and ≤ ~~[3106]~~ [3157] V
b. Loss of Voltage — Time Delay	~~[4]~~ 2	~~[SR 3.3.8.1.2]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ [2.0] seconds and ≤ ~~[2.?]~~ 11 seconds
c. Degraded Voltage — 4.16 kV ~~Basis~~	~~[4]~~ 2	~~[SR 3.3.8.1.1]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[3568.5]~~ [3814] V and ≤ ~~[3701.5]~~ [3900] V
d. Degraded Voltage — Time Delay, No LOCA	~~[4]~~ 2	~~[SR 3.3.8.1.2]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ [4.5] minutes and ≤ [5.5] minutes
e. Degraded Voltage — Time Delay, LOCA	~~[4]~~ 2	~~[SR 3.3.8.1.2]~~ SR 3.3.8.1.2 1 SR 3.3.8.1.3 2 SR 3.3.8.1.4 3	≥ ~~[illegible]~~ 9 seconds and ≤ ~~[illegible]~~ [11] seconds

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS: 3.3.8.1 - LOP INSTRUMENTATION

1. The proper LaSalle 1 and 2 plant specific nomenclature/value/design requirements have been provided.

2. The brackets have been removed and the proper plant specific information/value has been provided or the requirement has been deleted. The following requirements have been renumbered to reflect the deletion, as applicable.

3. ITS SR 3.3.8.1.1 CHANNEL FUNCTIONAL TEST Frequency has been changed from 31 days to 24 months consistent with the current refueling cycle intervals and the 24 month surveillance interval extension justifications.

<CTS>

3.3 INSTRUMENTATION

3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

<LCO 3.8.3.4> LCO 3.3.8.2 Two RPS electric power monitoring assemblies shall be OPERABLE for each inservice RPS motor generator set or alternate power supply.

<Appl 3.8.3.4> APPLICABILITY: MODES 1, 2, and 3, 3
MODES ~~4 and~~ 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies. 2 3

1 INSERT APP1

3 INSERT APP2

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
<3.8.3.4 Act a>	A. One or both inservice power supplies with one electric power monitoring assembly inoperable.	A.1	Remove associated inservice power supply(s) from service.	72 hours
<3.8.3.4 Act b>	B. One or both inservice power supplies with both electric power monitoring assemblies inoperable.	B.1	Remove associated inservice power supply(s) from service.	1 hour
<Doc A.3>	C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 <u>AND</u> C.2	Be in MODE 3. Be in MODE 4.	12 hours 36 hours

(continued)

<CTS>

<APPL 3.8.3.4>

Insert APP 1

MODES 4 and 5 with residual heat removal (RHR) shutdown cooling (SDC) isolation valves open,

Insert APP 2

During movement of irradiated fuel assemblies in the secondary containment,
During CORE ALTERATIONS,
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<DOC L.3>	D E 2 2 Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies. 4	D.1 E 2 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately
		AND 2	
<DOC L.3> 2	D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5 with RHR SDC isolation valves open.	D.2.1 D.1 2 Initiate action to restore one electric power monitoring assembly to OPERABLE status for inservice power supply(s) supplying required instrumentation.	Immediately 4
		OR	
<DOC L3> 3	INSERT ACTION F	D.2.2 2 Initiate action to isolate the ~~Residual Heat Removal Shutdown Cooling~~ System. RHR SDC 5	Immediately 4

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
<4.8.3.4.a>	SR 3.3.8.2.1	-------------------NOTE------------------- Only required to be performed prior to entering MODE 2 or 3 from MODE 4, when in MODE 4 for ≥ 24 hours. --- Perform CHANNEL FUNCTIONAL TEST.	184 days

(continued)

<CTS>

Insert ACTION F

<DOC L.3>

F. Required Action and associated Completion Time of Condition A or B not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.1.1 Isolate the associated secondary containment penetration flow path(s).	Immediately
	OR	
	F.1.2 Declare the associated secondary containment isolation valve(s) inoperable.	Immediately
	AND	
	F.2.1 Place the associated standby gas treatment (SGT) subsystem(s) in operation.	Immediately
	OR	
	F.2.2 Declare associated SGT subsystem(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
<4.8.3.4.b>	SR 3.3.8.2.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: a. Overvoltage ≤ [132] V (with time delay set to ≤ [4] seconds) ~~Bus A ≤ [132.9] V Bus B ≤ [133.0] V~~ b. Undervoltage ≥ [108] V (with time delay set to ≤ [4] seconds) ~~Bus A ≥ [115.0] V Bus B ≥ [115.9] V~~ c. Underfrequency (with time delay set to ~~[zero]~~ ≤ [4] seconds) ≥ [57] Hz ~~Bus A ≥ [57] Hz Bus B ≥ [57] Hz~~	~~[18]~~ 24 months 4 4
<4.8.3.4.b>	SR 3.3.8.2.3	Perform a system functional test.	~~[18]~~ 24 months 4

1. In MODES 4 and 5, the RPS Electric Power Monitoring assemblies are required to support the instrumentation that provides an isolation signal to the RHR SDC suction isolation valves. Thus, the Applicability has been modified to reflect this requirement.

2. The MODES 4 and 5 Applicability of ITS 3.3.8.2, "RPS Electric Power Monitoring," as it relates to control rod withdrawal, is revised to not include MODE 4, consistent with the Applicability of RPS Functions in ITS 3.3.1.1. In MODE 4, a control rod may be withdrawn from a core cell containing one or more fuel assemblies in accordance with ITS 3.10.3, "Single Control Rod Withdrawal — Cold Shutdown." Therefore, ITS 3.10.3 includes OPERABILITY requirements for RPS Functions and control rods (ITS 3.9.5). As a result, ITS 3.10.3 has been modified to also include requirements for the RPS Electric Power Monitoring assemblies to be OPERABLE when the RPS Functions and control rods are required to be OPERABLE. Commensurate changes to the ISTS 3.3.8.2 ACTIONS have also been made for consistency. ISTS 3.3.8.2 ACTION D has been split into two separate ACTIONS in ITS 3.3.8.2, one for when the RHR SDC suction isolation valves are open and the other for when a control rod is withdrawn. This provides separate and discrete ACTIONS for the two separate Applicabilities (MODE 4 and 5 with RHR SDC isolation valves open and MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies).

3. The RPS Electric Power Monitoring assemblies are required to support instrumentation that provides the secondary containment isolation and Standby Gas Treatment (SGT) System initiation signals. The instrumentation is listed in ITS 3.3.6.2. Therefore, the proper Applicabilities for these instruments have been added, consistent with both the instrumentation LCOs and the system LCOs (ITS 3.6.4.2 and 3.6.4.3). A new ACTION has also been added (ITS 3.3.8.2 ACTION F) to provide proper compensatory measures when the assemblies are inoperable in these new Applicabilities. The ACTION requires placing the affected components in the accident position (i.e., isolate the affected secondary containment penetration flow path(s) and place the associated SGT subsystems in operation) or declaring the associated SCIVs and SGT subsystem(s) inoperable. This new ACTION is consistent with the ACTIONS for the instrumentation LCOs, since the RPS electric power monitoring assemblies help ensure the instrumentation can perform their intended function.

4. The brackets have been removed and the proper plant specific information/value has been provided.

5. Editorial changes made to be consistent with other similar requirements in the ITS or for clarity.

B 3.3 INSTRUMENTATION

B 3.3.1.1 Reactor Protection System (RPS) Instrumentation

BASES

BACKGROUND

The RPS initiates a reactor scram when one or more monitored parameters exceed their specified limits to preserve the integrity of the fuel cladding and the Reactor Coolant System (RCS), and minimize the energy that must be absorbed following a loss of coolant accident (LOCA). This can be accomplished either automatically or manually. [1] [2]

pressure boundary (RCPB)

The protection and monitoring functions of the RPS have been designed to ensure safe operation of the reactor. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the RPS, as well as LCOs on other reactor system parameters, and equipment performance. The LSSS are defined in this Specification as the Allowable Values, which, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits, including Safety Limits (SLs), during Design Basis Accidents (DBAs).

[3] described — U — [3] — Section 7.2 — [4]

The RPS, as ~~shown~~ in the FSAR, ~~Figure [ ]~~ (Ref. 1), includes sensors, relays, bypass circuits, ~~and~~ switches that are necessary to cause initiation of a reactor scram. Functional diversity is provided by monitoring a wide range of dependent and independent parameters. The input parameters to the scram logic are from instrumentation that monitors reactor vessel water level; reactor vessel pressure; neutron flux; main steam line isolation valve position; turbine control valve (TCV) fast closure, trip oil pressure low; turbine stop valve (TSV) ~~trip oil pressure, low~~; drywell pressure and scram discharge volume (SDV) water level; as well as reactor mode switch in shutdown position and manual scram signals. There are at least four redundant sensor input signals from each of these parameters ~~(with the exception of the reactor mode switch in shutdown scram signal)~~. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When a setpoint is exceeded, the channel ~~output relay actuates, which then~~ outputs an RPS trip signal to the trip logic. ~~Table B 3.3.1.1-1 summarizes the diversity of sensors capable of initiating scrams during anticipated operating transients typically analyzed.~~

[1] ; — position — [3] — [3] — [3] — instrument switches or — [3] — [3] — [5]

(continued)

BASES

BACKGROUND (continued)

described 3

The RPS is comprised of two independent trip systems (A and B), with two logic channels in each trip system (logic channels A1 and A2, B1 and B2), as ~~shown~~ in Reference 1. The outputs of the logic channels in a trip system are combined in a one-out-of-two logic so either channel can trip the associated trip system. The tripping of both trip systems will produce a reactor scram. This logic arrangement is referred to as one-out-of-two taken twice logic. Each trip system can be reset by use of a reset switch. If a full scram occurs (both trip systems trip), a relay prevents reset of the trip systems for 10 seconds ~~after the full scram signal is received~~. This 10 second delay on reset ensures that the scram function will be completed. 3

is only possible if the conditions that caused the scram have been cleared. This

Two scram pilot valves are located in the hydraulic control unit (HCU) for each control rod drive (CRD). Each scram pilot valve is solenoid operated, with the solenoids normally energized. The scram pilot valves control the air supply to the scram inlet and outlet valves for the associated CRD. When either scram pilot valve solenoid is energized, air pressure holds the scram valves closed and, therefore, both scram pilot valve solenoids must be de-energized to cause a control rod to scram. The scram valves control the supply and discharge paths for the CRD water during a scram. One of the scram pilot valve solenoids for each CRD is controlled by trip system A, and the other solenoid is controlled by trip system B. Any trip of trip system A in conjunction with any trip in trip system B results in de-energizing both solenoids, air bleeding off, scram valves opening, and control rod scram. 3

The backup scram valves, which energize on a scram signal to depressurize the scram air header, are also controlled by the RPS. Additionally, the RPS System controls the SDV vent and drain valves such that when both trip systems trip, the SDV vent and drain valves close to isolate the SDV.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The actions of the RPS are assumed in the safety analyses of References 2, 3, and 4. The RPS initiates a reactor scram when monitored parameter values exceed the Allowable Values specified by the setpoint methodology and listed in Table 3.3.1.1-1 to preserve the integrity of the fuel cladding, the ~~reactor coolant pressure boundary (~~RCPB~~)~~, and 2

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

the containment by minimizing the energy that must be absorbed following a LOCA.

RPS instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). 3 Functions not specifically credited in the accident analysis are retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

The OPERABILITY of the RPS is dependent on the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.1.1-1. Each Function must have a required number of OPERABLE channels per RPS trip system, with their setpoints within the specified Allowable Value, where appropriate. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Each channel must also respond within its assumed response time, where applicable 6.

Allowable Values are specified for each RPS Function specified in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the actual setpoints do not exceed the Allowable Value between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined, accounting for the remaining instrument errors (e.g., drift).~~

3 The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrumentation errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components.

The trip setpoints ~~derived~~ and Allowable Values determined in this manner provide adequate protection because ~~instrumentation~~ instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe

(continued)

BASES

and appropriately applied for the instrumentation [3]

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

The OPERABILITY of scram pilot valves and associated solenoids, backup scram valves, and SDV valves, described in the Background section, are not addressed by this LCO. [3]

The individual Functions are required to be OPERABLE in the MODES [6] or other conditions specified in the Table that may require an RPS trip to mitigate the consequences of a design basis accident or transient. To ensure a reliable scram function, a combination of Functions is required in each MODE to provide primary and diverse initiation signals.

[6] The only MODES Specified in Table 3.3.1.1-1 are MODES 1 and 2, and

~~RPS is required to be OPERABLE in~~ MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies. In MODE 5, Control rods withdrawn from a core cell containing no fuel assemblies do not affect the reactivity of the core and therefore are not required to have the capability to scram. Provided all other control rods remain inserted, the no RPS function is not required. In this condition, the required SDM (LCO 3.1.1) and refuel position one-rod-out interlock (LCO 3.9.2) ensure that no event requiring RPS will occur. ~~During normal operation~~ No RPS Function is required in MODES 3 and 4, since all control rods are fully inserted and the Reactor Mode Switch Shutdown Position control rod withdrawal block (LCO 3.3.2.1) does not allow any control rod to be withdrawn. Under these conditions, the RPS function is not required to be OPERABLE.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1.a. Intermediate Range Monitor (IRM) Neutron Flux—High

The IRMs monitor neutron flux levels from the upper range of the source range monitors (SRMs) to the lower range of the average power range monitors (APRMs). The IRMs are capable of generating trip signals that can be used to prevent fuel damage resulting from abnormal operating transients in the intermediate power range. In this power range, the most significant source of reactivity change is due to control rod withdrawal. The IRM provides a [2] diverse protection function from ~~for~~ the rod ~~withdrawal limiter (RWL)~~ worth minimizer (RWM) [3], which monitors and controls

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Intermediate Range Monitor (IRM) Neutron Flux—High (continued)

RWM

the movement of control rods at low power. The ~~RWL~~ prevents the withdrawal of an out of sequence control rod during startup that could result in an unacceptable neutron flux excursion (Ref. 5). The IRM provides a backup to the APRM in ~~mitigation of the neutron flux excursion.~~ However, ~~To~~ demonstrate the capability of the IRM System to mitigate control rod withdrawal events, 2 a generic ~~analyses have~~ analysis has been performed (Ref. 6) to evaluate the consequences of control rod withdrawal events during startup that are mitigated only by the IRM. This analysis, which assumes that one IRM channel in each trip system is bypassed, demonstrates that the IRMs provide protection against local control rod withdrawal errors and results in peak fuel ~~energy depositions~~ enthalpy 2 below the 170 cal/gm fuel failure threshold criterion. 3

The IRMs are also capable of limiting other reactivity excursions during startup, such as cold water injection events, although no credit is specifically assumed.

The IRM System is divided into two groups of IRM channels, with four IRM channels inputting to each trip system. The analysis of Reference 6 assumes that one channel in each trip system is bypassed. Therefore, six channels with three channels in each trip system are required for IRM OPERABILITY to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. This trip is active in each of the 10 ranges of the IRM, which must be selected by the operator to maintain the neutron flux within the monitored level of an IRM range.

sm 1 2

The analysis of Reference 6 has adequate conservatism to permit 2 the ~~an~~ IRM Allowable Value ~~of 120 divisions of a 125 division scale.~~ specified in Table 3.3.1.1-1

The Intermediate Range Monitor Neutron Flux—High Function must be OPERABLE during MODE 2 when control rods may be withdrawn and the potential for criticality exists. In MODE 5, when a cell with fuel has its control rod withdrawn, the IRMs provide monitoring for and protection against unexpected reactivity excursions. In MODE 1, the APRM System, the 3 RWM and Rod Block Monitor ~~RWL and the Rod Pattern Controller (RPC)~~ provide protection against control rod withdrawal error events and the IRMs are not required. 3 The IRMs are automatically bypassed when the Reactor Mode Switch is in the run position.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

1.b. Intermediate Range Monitor—Inop

This trip signal provides assurance that a minimum number of IRMs are OPERABLE. Anytime an IRM mode switch is moved to any position other than "Operate," the detector voltage drops below a preset level, or a module is not plugged in, an inoperative trip signal will be received by the RPS unless the IRM is bypassed. Since only one IRM in each trip system may be bypassed, only one IRM in each RPS trip system may be inoperable without resulting in an RPS trip signal.

This Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

Six channels of Intermediate Range Monitor—Inop with three channels in each trip system are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal.

~~Since this Function is not assumed in the safety analysis,~~ 2 there is no Allowable Value for this Function.

This Function is required to be OPERABLE when the Intermediate Range Monitor Neutron Flux—High Function is required.

2.a. Average Power Range Monitor Neutron Flux—High, Setdown

, which 2

The APRM channels receive input signals from the local power range monitors (LPRM) within the reactor core ~~to~~ provide an indication of the power distribution and local power changes. The APRM channels average these LPRM signals to provide a continuous indication of average reactor power from a few percent to greater than RTP. For operation at low power (i.e., MODE 2), the Average Power Range Monitor Neutron Flux—High, Setdown Function is capable of generating a trip signal that prevents fuel damage resulting from abnormal operating transients in this power range. For most operation at low power levels, the Average Power Range Monitor Neutron Flux—High, Setdown Function will provide a secondary scram to the Intermediate Range Monitor Neutron Flux—High Function because of the relative setpoints. With

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.a. Average Power Range Monitor Neutron Flux—High, Setdown (continued)

the IRMs at Range 9 or 10, it is possible that the Average Power Range Monitor Neutron Flux—High, Setdown Function will provide the primary trip signal for a corewide increase in power. The initial core, fuel cycle independent analysis provided in Reference 5 indicates that a primary trip signal from the Average Power Range Monitor Neutron Flux-High, Setdown Function would provide adequate results. 3

~~No specific~~ The safety analyses (Ref. 5) take ~~direct~~ credit for the Average Power Range Monitor Neutron Flux—High, Setdown Function. ~~However,~~ ~~T~~this Function ~~indirectly~~ ensures that, before the reactor mode switch is placed in the run position, reactor power does not exceed 25% RTP (SL 2.1.1.1) when operating at low reactor pressure and low core flow. Therefore, it ~~indirectly~~ prevents fuel damage during significant reactivity increases with THERMAL POWER < 25% RTP. 3

The APRM System is divided into two groups of channels with three APRM channel inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. ~~Six~~ Four channels of Average Power Range Monitor Neutron Flux—High, Setdown, with ~~three~~ two channels in each trip system are required to be OPERABLE to ensure that no single failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least ~~11~~ 14 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located. 3

The Allowable Value is based on preventing significant increases in power when THERMAL POWER is < 25% RTP.

The Average Power Range Monitor Neutron Flux—High, Setdown Function must be OPERABLE during MODE 2 when control rods may be withdrawn ~~, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since the potential for criticality exists.~~ 7 and the potential for fuel damage from abnormal operating transients exists. 3 In MODE 1, the Average Power Range Monitor Neutron Flux—High Function provides protection against reactivity transients and the ~~RWL and RPC~~ RWM and Rod Block Monitor 3 protect against control rod withdrawal error events.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2.b. Average Power Range Monitor Flow Biased Simulated Thermal Power—High

Upscale 6

The Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function monitors neutron flux to approximate the THERMAL POWER being transferred to the reactor coolant. The APRM neutron flux is electronically filtered with a time constant representative of the fuel heat transfer dynamics to generate a signal proportional to the THERMAL POWER in the reactor. The trip level is varied as a function of recirculation drive flow (i.e., at lower core flows the setpoint is reduced proportional to the reduction in power experienced as core flow is reduced ~~with a fixed control rod pattern~~) but is clamped at an upper limit that is always lower than the Average Power Range Monitor Fixed Neutron Flux—High Function Allowable Value. 3

6 Upscale

The Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function provides protection against transients where THERMAL POWER increases slowly (such as the loss of feedwater heating event) and protects the fuel cladding integrity by ensuring that the MCPR SL is not exceeded. During these events, the THERMAL POWER increase does not significantly lag the neutron flux response and, because of a lower trip setpoint, will initiate a scram before the high neutron flux scram. For rapid neutron flux increase events, the THERMAL POWER lags the neutron flux and the Average Power Range Monitor Fixed Neutron Flux—High Function will provide a scram signal before the Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function setpoint is exceeded.

three

Four

6 Upscale

two

14

3

The APRM System is divided into two groups of channels with four APRM inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one Average Power Range Monitor channel in a trip system can cause the associated trip system to trip. Six channels of Average Power Range Monitor Flow Biased Simulated Thermal Power—High, with three channels in each trip system arranged in one-out-of-three logic, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 22 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located. ~~Each APRM channel receives one total drive flow signal representative~~

Insert B 3.3-8a

(continued)

Insert B 3.3-8a

Each APRM channel receives two independent, redundant flow signals representative of total recirculation drive flow. The total drive flow signals are generated by four flow units, two of which supply signals to the trip system A APRMs, while the other two supply signals to the trip system B APRMs. Each flow unit signal is provided by summing the flow signals from the two recirculation loops. These redundant flow signals are sensed from four pairs of elbow taps, two on each recirculation loops. No single active component failure can cause more than one of these two redundant signals to read incorrectly. To obtain the most conservative reference signals, the total flow signals from the two flow units (associated with a trip system as described above) are routed to a low auction circuit associated with each APRM. Each APRM's auction circuit selects the lower of the two flow unit signals for use as the scram trip reference for that particular APRM. Each required Average Power Range Monitor Flow Biased Simulated Thermal Power—Upscale channel only requires an input from one OPERABLE flow unit, since the individual APRM channel will perform the intended function with only one OPERABLE flow unit input. However, in order to maintain single failure criteria for the Function, at least one required Average Power Range Monitor Flow Biased Simulated Thermal Power—Upscale channel in each trip system must be capable of maintaining an OPERABLE flow unit signal in the event of a failure of an auction circuit, or a flow unit, in the associated trip system (e.g., if a flow unit is inoperable, one of the two required Average Power Range Monitor Flow Biased Simulated Thermal Power—Upscale channels in the associated trip system must be considered inoperable).

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.b. Average Power Range Monitor Flow Biased Simulated Thermal Power—High (continued) Upscale 6

~~of total core flow. The recirculation loop drive flow signals are generated by eight flow units. One flow unit from each recirculation loop is provided to each APRM channel. Total drive flow is determined by each APRM by summing up the flow signals provided to the APRM from the two recirculation loops.~~ 3

3 Insert Function 2.b

~~The clamped Allowable Value is based on analyses that take credit for the Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function for the mitigation of the loss of feedwater heater event.~~ The THERMAL POWER time constant of 6 ≤ 7 seconds is based on the fuel heat transfer dynamics and provides a signal that is proportional to the THERMAL POWER.

Upscale 6

The Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function is required to be OPERABLE in MODE 1 when there is the possibility of generating excessive THERMAL POWER and potentially exceeding the SL applicable to high pressure and core flow conditions (MCPR SL). During MODES 2 and 5, other IRM and APRM Functions provide protection for fuel cladding integrity.

2.c. Average Power Range Monitor Fixed Neutron Flux—High

The APRM channels provide the primary indication of neutron flux within the core and respond almost instantaneously to neutron flux increases. The Average Power Range Monitor Fixed Neutron Flux—High Function is capable of generating a trip signal to prevent fuel damage or excessive RCS pressure. For the overpressurization protection analysis of Reference 2, the Average Power Range Monitor Fixed Neutron Flux—High Function is assumed to terminate the main steam isolation valve (MSIV) closure event and, along with the safety/relief valves (S/RVs), limits the peak reactor pressure vessel (RPV) pressure to less than the ASME Code limits. The control rod drop accident (CRDA) analysis (Ref. 7) takes credit for the Average Power Range Monitor Fixed Neutron Flux—High Function to terminate the CRDA. The recirculation flow control failure event also credits this function (Ref. 4). 3

2 Reactor Coolant System (RCS)

3 8

The APRM System is divided into two groups of channels with four three 3 APRM channels inputting to each trip system. The system is designed to allow one channel in each trip system

(continued)

Insert Function 2.b

Although the Average Power Range Monitor Flow Biased Simulated Thermal Power—Upscale Function is not specifically credited in the safety analysis, the associated Allowable Value provides additional margin from transient induced fuel damage beyond that provided by the Average Power Range Monitor Fixed Neutron Flux—High Function. "W," in the Allowable Value column of Table 3.3.1.1-1, is the percentage of recirculation loop flow which provides a rated core flow of 108.5 million lbs/hr.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.c. Average Power Range Monitor Fixed Neutron Flux—High (continued)

to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. ~~Six~~ four 3 channels of Average Power Range Monitor Fixed Neutron Flux—High with ~~three~~ two 3 channels in each trip system arranged in a one-out-of-~~three~~ two logic are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least ~~11~~ 14 3 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located.

The Allowable Value is based on the Analytical Limit assumed in the CRDA analyses.

The Average Power Range Monitor Fixed Neutron Flux—High Function is required to be OPERABLE in MODE 1 where the potential consequences of the analyzed transients could result in the SLs (e.g., MCPR and RCS pressure) being exceeded. Although the Average Power Range Monitor Fixed Neutron Flux—High Function is assumed in the CRDA analysis (Ref. 8) 3 that is applicable in MODE 2, the Average Power Range Monitor Neutron Flux—High, Setdown Function conservatively bounds the assumed trip and, together with the assumed IRM trips, provides adequate protection. Therefore, the Average Power Monitor Fixed Neutron Flux—High Function is not required in MODE 2.

2.d. Average Power Range Monitor—Inop

This signal provides assurance that a minimum number of APRMs are OPERABLE. Anytime an APRM mode switch is moved to any position other than Operate, an APRM module is 3 unplugged, ~~the electronic/operating voltage is low,~~ or the APRM has too few LPRM inputs (< ~~11~~ 14 3), an inoperative trip signal will be received by the RPS, unless the APRM is bypassed. Since only one APRM in each trip system may be bypassed, only one APRM in each trip system may be inoperable without resulting in an RPS trip signal. This Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.d. Average Power Range Monitor—Inop (continued)

Four channels of Average Power Range Monitor—Inop with two channels in each trip system are required to be OPERABLE to ensure that no single failure will preclude a scram from this Function on a valid signal.

There is no Allowable Value for this Function.

This Function is required to be OPERABLE in the MODES where the APRM Functions are required.

2 other

3. Reactor Vessel Steam Dome Pressure—High

An increase in the RPV pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This causes the neutron flux and THERMAL POWER transferred to the reactor coolant to increase, which could challenge the integrity of the fuel cladding and the RCPB. No specific safety analysis takes direct credit for this Function. However, the Reactor Vessel Steam Dome Pressure—High Function initiates a scram for transients that results in a pressure increase, counteracting the pressure increase by rapidly reducing core power. For the overpressurization protection analysis of Reference 2, the reactor scram (the analyses conservatively assume scram on the Average Power Range Monitor Fixed Neutron Flux—High signal, not the Reactor Vessel Steam Dome Pressure-High ~~signal~~), along with the S/RVs, limits the peak RPV pressure to less than the ASME Section III Code limits. 3-1

3 or the Main Steam Isolation Valve-Closure signals

High reactor pressure signals are initiated from four pressure ~~transmitters~~ that sense reactor pressure. The Reactor Vessel Steam Dome Pressure—High Allowable Value is chosen to provide a sufficient margin to the ASME Section III Code limits during the event.

3 switches

Four channels of Reactor Vessel Steam Dome Pressure—High Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. The Function is required to be OPERABLE in MODES 1 and 2 when the RCS is pressurized and the potential for pressure increase exists.

since 1

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4. Reactor Vessel Water Level—Low, Level 3

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, a reactor scram is initiated at Level 3 to substantially reduce the heat generated in the fuel from fission. The Reactor Vessel Water Level—Low, Level 3 Function is assumed in the analysis of the recirculation line break (Ref. 3). The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the Emergency Core Cooling Systems (ECCS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

3 differential pressure

Reactor Vessel Water Level—Low, Level 3 signals are initiated from four, ~~level~~ transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

Four channels of Reactor Vessel Water Level—Low, Level 3 Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal.

The Reactor Vessel Water Level—Low, Level 3 Allowable Value is selected to ensure that, for transients involving loss of all normal feedwater flow, initiation of the low pressure ECCS at RPV Water Level 1 will not be required.

The Function is required in MODES 1 and 2 where considerable energy exists in the RCS resulting in the limiting transients and accidents. ECCS initiations at Reactor Vessel Water Level—Low Low, Level 2 and Low Low Low, Level 1 provide sufficient protection for level transients in all other MODES.

~~5. Reactor Vessel Water Level—High, Level 8~~

~~High RPV water level indicates a potential problem with the feedwater level control system, resulting in the addition of reactivity associated with the introduction of a significant amount of relatively cold feedwater. Therefore, a scram is initiated at Level 8 to ensure that MCPR is maintained above~~ 8

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5. Reactor Vessel Water Level—High, Level 8 (continued)

the MCPR SL. The Reactor Vessel Water Level—High, Level 8 Function is one of the many Functions assumed to be OPERABLE and capable of providing a reactor scram during transients analyzed in Reference 3. It is directly assumed in the analysis of feedwater controller failure, maximum demand (Ref. 4).

Reactor Vessel Water Level—High, Level 8 signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. The Reactor Vessel Water Level—High, Level 8 Allowable Value is specified to ensure that the MCPR SL is not violated during the assumed transient.

Four channels of the Reactor Vessel Water Level—High, Level 8 Function, with two channels in each trip system arranged in a one-out-of-two logic, are available and are required to be OPERABLE when THERMAL POWER is ≥ 25% RTP to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. With THERMAL POWER < 25% RTP, this Function is not required since MCPR is not a concern below 25% RTP.

B 5 ~~6~~. Main Steam Isolation Valve—Closure 8

MSIV closure results in loss of the main turbine and the condenser as a heat sink for the Nuclear Steam Supply System and indicates a need to shut down the reactor to reduce heat generation. Therefore, a reactor scram is initiated on a Main Steam Isolation Valve—Closure signal before the MSIVs are completely closed in anticipation of the complete loss of the normal heat sink and subsequent overpressurization transient. However, for the overpressurization protection analysis of Reference 2, the Average Power Range Monitor Fixed Neutron Flux—High Function, along with the S/RVs, limits the peak RPV pressure to less than the ASME Code limits. That is, the direct scram on position switches for MSIV closure events is not assumed in the overpressurization analysis. Additionally, MSIV closure is assumed in the transients analyzed in Reference 4 (e.g., low steam line pressure, manual closure of MSIVs, high steam line flow).

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5 [3]
~~6~~ Main Steam Isolation Valve—Closure (continued)

The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the ECCS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

MSIV closure signals are initiated from position switches located on each of the eight MSIVs. Each MSIV has two position switches; one inputs to RPS trip system A while the other inputs to RPS trip system B. Thus, each RPS trip system receives an input from eight Main Steam Isolation Valve—Closure channels, each consisting of one position switch. The logic for the Main Steam Isolation Valve—Closure Function is arranged such that either the inboard or outboard valve on three or more of the main steam lines (MSLs) must close in order for a scram to occur. In addition, certain combinations of valves closed in two lines will result in a half scram. [3]

The Main Steam Isolation Valve—Closure Allowable Value is specified to ensure that a scram occurs prior to a significant reduction in steam flow, thereby reducing the severity of the subsequent pressure transient.

Sixteen channels of the Main Steam Isolation Valve—Closure Function with eight channels in each trip system are required to be OPERABLE to ensure that no single instrument failure will preclude the scram from this Function on a valid signal. This Function is only required in MODE 1 since, with the MSIVs open and the heat generation rate high, a pressurization transient can occur if the MSIVs close. In MODE 2, the heat generation rate is low enough so that the other diverse RPS functions provide sufficient protection.

6 [3]
~~7~~ Drywell Pressure—High

High pressure in the drywell could indicate a break in the RCPB. A reactor scram is initiated to minimize the possibility of fuel damage and to reduce the amount of energy being added to the coolant and the drywell. The Drywell Pressure—High Function is a secondary scram signal to Reactor Vessel Water Level—Low, Level 3 for LOCA ~~events inside the drywell~~ analysis. This Function was not specifically credited in the Appendix K accident analysis to initiate a reactor trip but it is retained for [3]

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6 3

~~7~~. Drywell Pressure—High (continued)

the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

The reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the ECCS, ensures that the fuel peak cladding temperature remains below the limits of 10CFR50.46. 2

High drywell pressure signals are initiated from four pressure ~~transmitters~~ 3 Switches that sense drywell pressure. The Allowable Value was selected to be as low as possible and be indicative of a LOCA inside primary containment.

Four channels of Drywell Pressure—High Function, with two channels in each trip system, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. The Function is required in MODES 1 and 2 where considerable energy exists in the RCS, resulting in the limiting transients and accidents.

7 3

~~8~~.a. b. Scram Discharge Volume Water Level—High

The SDV receives the water displaced by the motion of the CRD pistons during a reactor scram. Should this volume fill to a point where there is insufficient volume to accept the displaced water, control rod insertion would be hindered. Therefore, a reactor scram is initiated when the remaining free volume is still sufficient to accommodate the water from a full core scram. However, even though the two types of Scram Discharge Volume Water Level—High Functions are an input to the RPS logic, no credit is taken for a scram initiated from these Functions for any of the design basis accidents or transients analyzed in the U FSAR. 3 However, they are retained to ensure that the RPS remains OPERABLE.

SDV water level is measured by two diverse methods. The level in each of the two SDVs is measured by two float type level switches and two transmitters and trip units for a total of eight level signals. The outputs of these devices are arranged so that there is a signal from a level switch and a transmitter and trip unit to each RPS logic channel. The level measurement instrumentation satisfies the recommendations of Reference ~~8~~ 9 3.

The Allowable Value is chosen low enough to ensure that there is sufficient volume in the SDV to accommodate the water from a full scram.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

7 8a, b. Scram Discharge Volume Water Level—High (continued)

each type in

Four channels of each type of Scram Discharge Volume Water Level—High Function, with two channels of each trip system, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from these Functions on a valid signal. These Functions are required in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn. At all other times, this Function may be bypassed.

8 9. Turbine Stop Valve Closure, ~~Trip Oil Pressure—Low~~

Closure of the TSVs results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated at the start of TSV closure in anticipation of the transients that would result from the closure of these valves. The Turbine Stop Valve Closure, ~~Trip Oil Pressure—Low Function~~ is the primary scram signal for the turbine trip event analyzed in Reference 4. For this event, the reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the End of Cycle Recirculation Pump Trip (EOC-RPT) System, ensures that the MCPR SL is not exceeded.

Turbine Stop Valve Closure, ~~Trip Oil Pressure—Low~~ signals are initiated by ~~the electrohydraulic control (EHC) fluid pressure~~ valve stem position switches at each stop valve. Two independent ~~pressure transmitters~~ switches are associated with each stop valve. One of the two ~~transmitters~~ switches provides input to RPS trip system A; the other, to RPS trip system B. Thus, each RPS trip system receives an input from four Turbine Stop Valve Closure ~~Trip Oil Pressure—Low~~ channels, each consisting of one ~~pressure transmitter~~ valve stem position switch. The logic for the Turbine Stop Valve Closure ~~Trip Oil Pressure—Low~~ Function is such that three or more TSVs must be closed to produce a scram. In addition, certain combinations of two valves closed will result in a half scram.

This Function must be enabled at THERMAL POWER ≥ ~~40%~~ 25% RTP. This is normally accomplished automatically by pressure ~~transmitters~~ switches sensing turbine first stage pressure; therefore, ~~to consider this Function OPERABLE,~~ the turbine opening

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

8 8 ~~9~~. Turbine Stop Valve – Closure~~, Trip Oil Pressure—Low~~ 6
(continued)

~~may affect this Function.~~ 9

bypass valves ~~must remain shut at THERMAL POWER ≥ 40% RTP.~~ ~~The setpoint is feedwater temperature dependent as a result of the subcooling changes that affect the turbine first stage pressure/reactor power relationship. For RTP operation with feedwater temperature ≥ 420°F, an allowable setpoint of ≤ 26.9% of control valve wide open turbine first stage pressure is provided by the bypass function. The allowable setpoint is reduced to ≤ 22.5% of control valve wide open turbine first stage pressure for RTP operation with feedwater temperature > 370°F and < 420°F.~~ 3

The Turbine Stop Valve – Closure~~, Trip Oil Pressure—Low~~ 6 Allowable Value is selected to ~~be high enough to~~ detect 3 imminent TSV closure thereby reducing the severity of the subsequent pressure transient.

Eight channels of Turbine Stop Valve – Closure~~, Trip Oil Pressure—Low~~ 6 Function, with four channels in each trip system, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function if the ~~any three~~ TSVs should close. This Function is required, consistent with analysis assumptions, whenever THERMAL POWER is ≥ 25 ~~40~~% RTP. This Function is not required when THERMAL POWER is < 25 ~~40~~% RTP since the Reactor Vessel Steam Dome Pressure—High and the Average Power Range Monitor Fixed Neutron Flux—High Functions are adequate to maintain the necessary safety margins. 3

9 8 ~~10~~. Turbine Control Valve Fast Closure, Trip Oil Pressure—Low

Fast closure of the TCVs results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, a reactor scram is initiated on TCV fast closure in anticipation of the transients that would result from the closure of these valves. The Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Function is the primary scram signal for the generator load rejection event analyzed in Reference 4. For this event, the reactor scram reduces the amount of energy required to be absorbed and, along with the actions of the EOC-RPT System, ensures that the MCPR SL is not exceeded.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

9 3

~~10~~. Turbine Control Valve Fast Closure, Trip Oil Pressure—Low (continued)

Turbine Control Valve Fast Closure, Trip Oil Pressure—Low signals are initiated by the EHC fluid pressure ~~at~~ to each control valve. There is one pressure ~~transmitter~~ switch associated with each control valve, the signal from each ~~transmitter~~ switch being assigned to a separate RPS logic channel. This Function must be enabled at THERMAL POWER ≥ ~~40%~~ 25% RTP. This is ~~normally~~ accomplished automatically by pressure ~~transmitters~~ switches sensing turbine first stage pressure; therefore, opening ~~to consider this Function OPERABLE,~~ the turbine bypass valves ~~must remain shut at THERMAL POWER ≥ 40% RTP.~~ may affect this Function. 9 3 ~~The basis for the setpoint of this automatic bypass is identical to that described for the Turbine Stop Valve Closure, Trip Oil Pressure—Low Function.~~ 3

The Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Allowable Value is selected high enough to detect imminent TCV fast closure.

Four channels of Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Function, with two channels in each trip system arranged in a one-out-of-two logic, are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. This Function is required, consistent with the analysis assumptions, whenever THERMAL POWER is ≥ ~~40%~~ 25% RTP. This Function is not required when THERMAL POWER is < ~~40%~~ RTP since the Reactor Vessel Steam Dome Pressure—High and the Average Power Range Monitor Fixed Neutron Flux—High Functions are adequate to maintain the necessary safety margins. 3

10 8

~~11~~. Reactor Mode Switch—Shutdown Position

The Reactor Mode Switch—Shutdown Position Function provides signals, via the manual scram logic channels, that are redundant to the automatic protective instrumentation channels and provide manual reactor trip capability. This Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

10 - 8

~~11~~. Reactor Mode Switch—Shutdown Position (continued)

The reactor mode switch is a single switch with four channels~~,~~ (one from each of the four independent banks of contacts), each of which inputs into one of the RPS logic channels.

3

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on reactor mode switch position.

Four channels of Reactor Mode Switch—Shutdown Position Function, with two channels in each trip system, are available and required to be OPERABLE. The Reactor Mode—Switch—Shutdown Position Function is required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

1

11 - 5

~~12~~. Manual Scram

The Manual Scram push button channels provide signals, via the manual scram logic channels, to each of the four RPS logic channels that are redundant to the automatic protective instrumentation channels and provide manual reactor trip capability. This Function was not specifically credited in the accident analysis, but it is retained for the overall redundancy and diversity of the RPS as required by the NRC approved licensing basis.

There is one Manual Scram push button channel for each of the four RPS logic channels. In order to cause a scram it is necessary that at least one channel in each trip system be actuated.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

Four channels of Manual Scram with two channels in each trip system arranged in a one-out-of-two logic, are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

BASES (continued)

ACTIONS

~~Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.~~ 10

2 — 1 ~~A~~ Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate, inoperable channels. As such, ~~a~~ Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

8 Insert Note 2

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Ref. ~~9~~ 10) 3 to permit restoration of any inoperable required channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function's inoperable channel is in one trip system and the Function still maintains RPS trip capability (refer to Required Actions B.1, B.2, and C.1 Bases.) If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Required Actions A.1 and A.2. Placing the inoperable channel in trip (or the associated trip system in trip) would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a ~~full~~ scram or recirculation pump trip (RPT)), Condition D must be entered and its Required Action taken. 3

(continued)

<u>Insert Note 2</u>

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Simulated Thermal Power—Upscale (Function 2.b) and APRM Fixed Neutron Flux—High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the gain adjustment factor (GAF) is high (non-conservative), and for up to 12 hours if the GAF is low (conservative). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels and additional time is allowed when the GAF is out of limits but conservative.

BASES

ACTIONS (continued)

B.1 and B.2

Condition B exists when, for any one or more Functions, at least one required channel is inoperable in each trip system. In this condition, provided at least one channel per trip system is OPERABLE, the RPS still maintains trip capability for that Function, but cannot accommodate a single failure in either trip system.

Required Actions B.1 and B.2 limit the time the RPS scram logic for any Function would not accommodate single failure in both trip systems (e.g., one-out-of-one and one-out-of-one arrangement for a typical four channel Function). The reduced reliability of this logic arrangement was not evaluated in Reference ~~8~~ 10 [3] for the 12 hour Completion Time. Within the 6 hour allowance, the associated Function will have all required channels either OPERABLE or in trip (or in any combination) in one trip system.

Completing one of these Required Actions restores RPS to an equivalent reliability level as that evaluated in Reference ~~8~~ 10 [3], which justified a 12 hour allowable out of service time as presented in Condition A. The trip system in the more degraded state should be placed in trip or, alternatively, all the inoperable channels in that trip system should be placed in trip (e.g., a trip system with two inoperable channels could be in a more degraded state than a trip system with four inoperable channels, if the two inoperable channels are in the same Function while the four inoperable channels are all in different Functions). The decision as to which trip system is in the more degraded state should be based on prudent judgment and current plant conditions (i.e., what MODE the plant is in). If this action would result in a scram or ~~recirculation pump trip~~ RPT [2], it is permissible to place the other trip system or its inoperable channels in trip.

The 6 hour Completion Time is judged acceptable based on the remaining capability to trip, the diversity of the sensors available to provide the trip signals, the low probability of extensive numbers of inoperabilities affecting all diverse Functions, and the low probability of an event requiring the initiation of a scram.

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

Alternately, if it is not desired to place the inoperable channels (or one trip system) in trip (e.g., as in the case where placing the inoperable channel or associated trip system in trip would result in a scram (or RPT)), Condition D must be entered and its Required Action taken. 4

C.1

Required Action C.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same trip system for the same Function result in the Function not maintaining RPS trip capability. A Function is considered to be maintaining RPS trip capability when sufficient channels are OPERABLE or in trip (or the associated trip system is in trip), such that both trip systems will generate a trip signal from the given Function on a valid signal. For the typical Function with one-out-of-two taken twice logic and the IRM and APRM Functions, this would require both trip systems to have one channel OPERABLE or in trip (or the associated trip system in trip). For Function ~~6~~ 5 (Main Steam Isolation Valve—Closure), this would require both trip systems to have each channel associated with the MSIVs in three MSLs (not necessarily the same MSLs for both trip systems), OPERABLE or in trip (or the associated trip system in trip). 8

For Function ~~7~~ 8 (Turbine Stop Valve—Closure~~, Trip Oil Pressure—Low~~), this would require both trip systems to have three channels, each OPERABLE or in trip (or the associated trip system in trip). 6

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

D.1

Required Action D.1 directs entry into the appropriate Condition referenced in Table 3.3.1.1-1. The applicable Condition specified in the table is Function and MODE or 2

(continued)

BASES

ACTIONS

D.1 (continued)

other specified condition dependent and may change as the Required Action of a previous Condition is completed. Each time an inoperable channel has not met any Required Action of Condition A, B, or C, and the associated Completion Time has expired, Condition D will be entered for that channel and provides for transfer to the appropriate subsequent Condition.

E.1, F.1, G.1, and H.1

If the channel(s) is not restored to OPERABLE status or placed in trip (or the associated trip system placed in trip) within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. The Completion Times are reasonable, based on operating experience, to reach the specified condition from full power conditions in an orderly manner and without challenging plant systems. In addition, the Completion Time of Required Action E.1 is consistent with the Completion Time provided in LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)."

H → I.1

If the channel(s) is not restored to OPERABLE status or placed in trip (or the associated trip system placed in trip) within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by immediately initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and are, therefore, not required to be inserted. Action must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted.

BASES (continued)

SURVEILLANCE REQUIREMENTS

~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~ 10

As noted at the beginning of the SRs, the SRs for each RPS instrumentation Function are located in the SRs column of Table 3.3.1.1-1.

The Surveillances are modified by a Note to indicate that, when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RPS trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the RPS reliability analysis (Ref. 10) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary. 6 3

SR 3.3.1.1.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift on one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

8
TSTF-264 changes not adopted

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.1 (continued)

The Frequency is based upon 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 channels required by the LCO.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. ~~LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints," allows the APRMs to be reading greater than actual THERMAL POWER to compensate for localized power peaking. When this adjustment is made, the requirement for the APRMs to indicate within 2% RTP of calculated power is modified to require the APRMs to indicate within 2% RTP of calculated MFLPD.~~ 4 The Frequency of once per 7 days is based on minor changes in LPRM sensitivity, which could affect the APRM reading between performances of SR 3.3.1.1.~~8~~ 7 8.

~~A restriction to satisfying this SR when < 25% RTP~~ An allowance 6 is provided that requires the SR to be ~~met~~ performed only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 25% RTP. At low power levels, a high degree of accuracy is unnecessary because of the ~~large~~ 2 inherent margin to thermal limits (MCPR and APLHGR). At ≥ 25% RTP, the Surveillance is required to have been satisfactorily performed within the last 7 days in accordance with SR 3.0.2. A Note is provided which allows an increase in THERMAL POWER above 25% if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within 12 hours after reaching or exceeding 25% RTP. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR.

SR 3.3.1.1.3 Upscale 3

The Average Power Range Monitor Flow Biased Simulated Thermal Power—High Function uses the recirculation loop drive flows to vary the trip setpoint. This SR ensures that

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.3 (continued)

the total loop drive flow signals from the flow unit used to vary the setpoint are appropriately compared to a calibrated flow signal and therefore the APRM Function accurately reflects the required setpoint as a function of flow. Each flow signal from the respective flow unit must be ≤ ~~105%~~ 100% of the calibrated flow signal. If the flow unit signal is not ~~within the limit,~~ ~~the~~ one required APRM~~s~~ that receive~~s~~ an input from the inoperable flow unit must be declared inoperable. 3

The Frequency of 7 days is based on engineering judgment, operating experience, and the reliability of this instrumentation.

SR 3.3.1.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the intended function. 2

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

As noted, SR 3.3.1.1.4 is not required to be performed when entering MODE 2 from MODE 1 since testing of the MODE 2 required IRM and APRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This allows entry into MODE 2 if the 7 day Frequency is not met per SR 3.0.2. In this event, the SR must be performed within ~~12~~ 24 hours after entering MODE 2 from MODE 1. ~~Twelve~~ Twenty-four hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR. 3

A Frequency of 7 days provides an acceptable level of system average unavailability over the Frequency interval and is based on reliability analysis (Ref. ~~9~~ 10). 3

SR 3.3.1.1.5

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the 2

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.5 (continued)

intended Function. A Frequency of 7 days provides an acceptable level of system average availability over the Frequency and is based on the reliability analysis of Reference ~~8~~ 10 [3]. (The Manual Scram Function's CHANNEL FUNCTIONAL TEST Frequency was credited in the analysis to extend many automatic scram Functions' Frequencies.)

SR 3.3.1.1.6 and SR 3.3.1.1.7

These Surveillances are established to ensure that no gaps in neutron flux indication exist from subcritical to power operation for monitoring core reactivity status.

[8] TSTF-264 changes not adopted

The overlap between SRMs and IRMs is required to be demonstrated to ensure that reactor power will not be increased into a region without adequate neutron flux indication. This is required prior to fully [8] withdrawing SRMs ~~from~~ [8] ~~the fully inserted position~~ [8] since indication is being transitioned from the SRMs to the IRMs.

The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (initiate a rod block) if adequate overlap is not maintained. ~~Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block, or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above mid-scale on range I before SRMs have reached the upscale rod block.~~ [3]

[3] The IRM/APRM and SRM/IRM overlaps are acceptable if a ½ decade overlap exists.

As noted, SR 3.3.1.1.7 is only required to be met during entry into MODE 2 from MODE 1. That is, after the overlap requirement has been met and indication has transitioned to the IRMs, maintaining overlap is not required (APRMs may be reading downscale once in MODE 2).

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channel(s) declared inoperable. Only those appropriate

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.6 and SR 3.3.1.1.7 (continued)

channel(s) that are required in the current MODE or condition should be declared inoperable.

A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.

SR 3.3.1.1.8

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 1000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes.

[6] effective full power hours (EFPH)

SR 3.3.1.1.9 and SR 3.3.1.1.12

A CHANNEL FUNCTIONAL TEST is [2] performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. (4) [1] The 92 day Frequency of SR 3.3.1.1.9 is based on the reliability analysis of Reference 9. [3] (10)

of SR 3.3.1.1.12 [12]

[9] (24) The 28 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency.

(24) [15]

~~SR 3.3.1.1.10~~

~~The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.1.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but~~ [8]

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.10 (continued)

is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days for SR 3.3.1.1.10 is based on the reliability analysis of Reference 9.

8

SR 3.3.1.1.10,

SR 3.3.1.1.11 and SR 3.3.1.1.13

8

A CHANNEL CALIBRATION is a complete check of the instrument loop, and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

3 , including associated trip unit,

of SR 3.3.1.1.11 and SR 3.3.1.1.13 8

Note 1 states that neutron detectors are excluded from CHANNEL CALIBRATION because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day calorimetric calibration (SR 3.3.1.1.2) and the 1000 MWD/T EFPH 8 LPRM calibration against the TIPs (SR 3.3.1.1.8). A second Note to SR 3.3.1.1.11 and SR 3.3.1.1.13 8 is provided that requires the APRM and IRM SRs to be performed within 12 24 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads, or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. 3 Twenty four Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR. The Frequencies ies of SR 3.3.1.1.11 10 and SR 3.3.1.1.11 are 13 based upon the assumption of a 92 day and 184 day calibration interval, respectively, in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.1.1.13 is based on the assumption of an 18 24 8 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

8

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.14

Upscale 6

The Average Power Range Monitor Flow Biased Simulated Thermal Power—~~High~~ Function uses an electronic filter circuit to generate a signal proportional to the core THERMAL POWER from the APRM neutron flux signal. This filter circuit is representative of the fuel heat transfer dynamics that produce the relationship between the neutron flux and the core THERMAL POWER. The filter time constant must be verified to ensure that the channel is accurately reflecting the desired parameter.

The Frequency of ~~18~~ 24 8 months is based on engineering judgment and reliability of the components.

SR 3.3.1.1.15

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The functional testing of control rods, in LCO 3.1.3, "Control Rod OPERABILITY," and SDV vent and drain valves, in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," overlaps this Surveillance to provide complete testing of the assumed safety function.

The ~~18~~ 24 8 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the ~~18~~ 24 8 month Frequency.

SR 3.3.1.1.16

This ~~SR~~ − 6 ensures that scrams initiated 6 from the Turbine Stop Valve Closure~~, Trip Oil Pressure—Low~~ and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ ~~40~~ 25 3 % RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodology are incorporated into 3 the Allowable Value and the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from turbine

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.16 (continued)

, if performing the calibration using actual turbine first stage pressure, 2

first stage pressure), the main turbine bypass valves must remain closed at THERMAL POWER ≥ 40% RTP to ensure that the calibration remains valid.

during in-service calibration 9

15 9

25 3

If any bypass channel setpoint is nonconservative (i.e., the Functions are bypassed at ≥ 40% RTP, either due to open main turbine bypass valve(s) or other reasons), then the affected Turbine Stop Valve ~~, Trip Oil Pressure—Low~~ and Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel is considered OPERABLE.

3 - Closure

24 8

The Frequency of 18 months is based on engineering judgment and reliability of the components.

SR 3.3.1.1.17

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The RPS RESPONSE TIME acceptance criteria are included in Reference ~~4~~. ~~3~~.

11 4

(Note 1)

As noted, neutron detectors are excluded from RPS RESPONSE TIME testing because the principles of detector operation virtually ensure an instantaneous response time.

<Insert Note 4>

3 24

RPS RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. Note 2 requires STAGGERED TEST BASIS Frequency to be determined based on 4 channels per trip system, in lieu of the 8 channels specified in Table 3.3.1.1-1 for the MSIV Closure Function. This Frequency is based on the logic interrelationships of the various channels required to produce an RPS scram signal. Therefore, staggered testing results in response time verification of these devices every 18 months. The 18 month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent.

24

2

8

(continued)

Insert Note 4

In addition, Note 2 states the response time of the sensor for Functions 3 and 4 may be assumed to be the design sensor response time, and therefore, are excluded from RPS RESPONSE TIME testing. This is allowed since the sensor response time is a small part of the overall RPS RESPONSE TIME (Ref. 12). However, the response time for the remaining portion of the channel, including the trip unit and relay logic, is required to be performed. Note 4 states that the response time of the limit switches for Function 8 may be conservatively assumed and therefore, are excluded from the RPS RESPONSE TIME testing. This is allowed since the actual measurement of the limit switch response time is not practicable as this test is done during the refueling outage when the turbine stop valves are fully closed, and thus the limit switch in the RPS circuitry is open. The response time of the limit switch is conservatively assumed to be 10 ms. Note 5 modifies the starting point of the RPS RESPONSE TIME test for Function 9, since this starting point (start of turbine control valve fast closure) corresponds to safety analysis assumptions.

BASES (continued)

REFERENCES

1. FSAR, ~~Figure [ ]~~ Section 7.2 [4]

2. FSAR, Section ~~[~~5.2.2~~]~~. [4]

3. FSAR, Section ~~[~~6.3.3~~]~~. [4]

[3] U

4. FSAR, Chapter ~~[~~15~~]~~. [4]

5. FSAR, Section ~~[~~15.4.1~~]~~. [4]

6. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.

7. UFSAR, Section 7.6.3.3. [3]

8 ~~7~~. U FSAR, Section ~~[~~15.4.9~~]~~. [4] [3]

9 ~~8~~. Letter, P. Check (NRC) to G. Lainas (NRC), "BWR Scram Discharge System Safety Evaluation," December 1, 1980.

10 ~~9~~. NEDO-30851-P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

[3]

11. Technical Requirements Manual.

12. NEDO-32291-A, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1995. [3]

Table B 3.3.1.1-1 (page 1 of 1)*
RPS Instrumentation Sensor Diversity

Initiation Events	Scram Sensors for Initiating Events						
	RPV Variables			Anticipatory			Fuel
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
MSIV Closure	x		x			x	x
Turbine Trip (w/bypass)	x			x	x		x
Generator Trip (w/bypass)	x			x			x
Pressure Regulator Failure (primary pressure decrease) (MSIV closure trip)	x	x	x			x	x
Pressure Regulator Failure (primary pressure decrease) (Level 8 trip)	x				x		x
Pressure Regulator Failure (primary pressure increase)	x						x
Feedwater Controller Failure (high reactor water level)	x	x			x		x
Feedwater Controller Failure (low reactor water level)	x		x			x	
Loss of Condenser Vacuum	x				x	x	x
Loss of AC Power (loss of transformer)	x		x		x	x	
Loss of AC Power (loss of grid connections)	x		x	x	x	x	x

(a) Reactor Vessel Steam Dome Pressure—High
(b) Reactor Vessel Water Level—High, Level 8 5
(c) Reactor Vessel Water Level—Low, Level 3
(d) Turbine Control Valve Fast Closure
(e) Turbine Stop Valve—Closure
(f) Main Steam Isolation Valve—Closure
(g) Average Power Range Monitor Neutron Flux—High

* This table is for illustration purposes only.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.1.1 - RPS INSTRUMENTATION

1. Typographical/grammatical error corrected.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

4. The brackets have been removed and the proper plant specific information/value has been provided.

5. This Table has been deleted since it provides generic and not plant specific types of information. The information in the Table could be misleading as to which plant specific analyses take credit for these channels to perform a function during accident and transient scenarios.

6. Changes have been made to more closely reflect the Specification requirements.

7. This change was approved to be made in NUREG-1434, Rev. 1 per change package BWROG-1A, C.1, but apparently was not made. This change was made to the BWR/4 ITS, NUREG-1433, Rev 1.

8. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

9. The words have been modified to state that opening the bypass valves may affect this Function. If the bypass valves are open above 25% RTP, but the Function is still enforcing the scram (i.e., it is not bypassed), there is no reason to declare the Function inoperable. If the Function is bypassed above 25% RTP due to an open bypass valve, then the Function would be inoperable. The proposed words state that an open bypass valve could affect this Function. The words in the Bases for proposed SR 3.3.1.1.16 (ISTS SR 3.3.1.1.16) have been modified to state that the bypass valves must remain closed during the calibration if using actual turbine first stage pressure. At other times, the bypass valves can be open (and the bypass valves are periodically opened to perform SRs) as long as the Function is not inadvertently bypassed.

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

B 3.3 INSTRUMENTATION

B 3.3.1.2 Source Range Monitor (SRM) Instrumentation

BASES

BACKGROUND

The SRMs provide the operator with information relative to the neutron level at very low flux levels in the core. As such, the SRM indication is used by the operator to monitor the approach to criticality and to determine when criticality is achieved. The SRMs are ~~maintained~~ not fully ~~inserted~~ withdrawn until the count rate is greater than a minimum allowed count rate (a control rod block is set at this condition). After SRM to intermediate range monitor (IRM) overlap is demonstrated (as required by SR 3.3.1.1.6), the SRMs are normally fully withdrawn from the core. 3 2 TSTF-264 changes not adopted

The SRM subsystem of the Neutron Monitoring System (NMS) consists of ~~five~~ four 1 channels. Each of the SRM channels can be bypassed, but only one at any given time, by the operation of a bypass switch. Each channel includes one detector that can be physically positioned in the core. Each detector assembly consists of a miniature fission chamber with associated cabling, signal conditioning equipment, and electronics associated with the various SRM functions. The signal conditioning equipment converts the current pulses from the fission chamber to analog DC currents that correspond to the count rate. Each channel also includes indication, alarm, and control rod blocks. However, this LCO specifies OPERABILITY requirements only for the monitoring and indication functions of the SRMs.

During refueling, shutdown, and low power operations, the primary indication of neutron flux levels is provided by the SRMs or special movable detectors connected to the normal SRM circuits. The SRMs provide monitoring of reactivity changes during fuel or control rod movement and give the control room operator early indication of unexpected subcritical multiplication that could be indicative of an approach to criticality.

APPLICABLE SAFETY ANALYSES

Prevention and mitigation of prompt reactivity excursions during refueling and low power operation are provided by LCO 3.9.1, "Refueling Equipment Interlocks"; LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"; LCO 3.3.1.1, "Reactor Protection

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

System (RPS) Instrumentation," Intermediate Range Monitor (IRM) Neutron Flux—High and Average Power Range Monitor (APRM) Neutron Flux—High, Setdown Functions; and LCO 3.3.2.1, "Control Rod Block Instrumentation."

3 UFSAR

The SRMs have no safety function and are not assumed to function during any design basis accident or transient analysis. However, the SRMs provide the only on scale monitoring of neutron flux levels during startup and refueling. Therefore, they are being retained in the Technical Specifications.

LCO

three 1 four 2

During startup in MODE 2, four of the five SRM channels are required to be OPERABLE to monitor the reactor flux level prior to and during control rod withdrawal, to monitor subcritical multiplication and reactor criticality, and to monitor neutron flux level and reactor period until the flux level is sufficient to maintain the IRM on Range 3 or above. All channels but one are required in order to provide a representation of the overall core response during those periods when reactivity changes are occurring throughout the core.

In MODES 3 and 4, with the reactor shut down, two SRM channels provide redundant monitoring of flux levels in the core.

normal changes in

In MODE 5, during a spiral offload or reload, an SRM outside the fueled region will no longer be required to be OPERABLE, since it is not capable of monitoring neutron flux in the fueled region of the core. Thus, CORE ALTERATIONS are allowed in a quadrant with no OPERABLE SRM in an adjacent quadrant, as provided in the Table 3.3.1.2-1, footnote (b), requirement that the bundles being spiral reloaded or spiral offloaded are all in a single fueled region containing at least one OPERABLE SRM is met. Spiral reloading and offloading encompass reloading or offloading a cell on the edges of a continuous fueled region (the cell can be reloaded or offloaded in any sequence). 3

In nonspiral routine operations, two SRMs are required to be OPERABLE to provide redundant monitoring of reactivity changes occurring in the reactor core. Because of the local nature of reactivity changes during refueling, adequate

(continued)

BASES

LCO (continued)

coverage is provided by requiring one SRM to be OPERABLE in the quadrant of the reactor core where CORE ALTERATIONS are being performed and the other SRM to be OPERABLE in an adjacent quadrant containing fuel. These requirements ensure that the reactivity of the core will be continuously monitored during CORE ALTERATIONS.

Special movable detectors, according to Table 3.3.1.2-1, footnote (c), may be used ~~during CORE ALTERATIONS~~ in MODE 5 in place of the normal SRM nuclear detectors. These special detectors must be connected to the normal SRM circuits in the NMS such that the applicable neutron flux indication can be generated. These special detectors provide more flexibility in monitoring reactivity changes during fuel loading, since they can be positioned anywhere within the core during refueling. They must still meet the location requirements of SR 3.3.1.2.2, and all other required SRs for SRMs. 2

For an SRM channel to be considered OPERABLE, it must be providing neutron flux monitoring indication. In addition, in MODE 5, the required SRMs must be inserted to the normal operating level and be providing continuous visual indication in the control room. 1

APPLICABILITY

The SRMs are required to be OPERABLE in MODES ~~2,~~ 3, 4, and 5, ~~prior to the IRMs being on scale on Range 3~~ and MODE 2 to provide for neutron monitoring. In MODE 1, the APRMs provide adequate monitoring of reactivity changes in the core; therefore, the SRMs are not required. In MODE 2, with IRMs on Range 3 or above, the IRMs provide adequate monitoring and the SRMs are not required. 4

ACTIONS

A.1 and B.1

In MODE 2, with the IRMs on Range 2 or below, SRMs provide the means of monitoring core reactivity and criticality. With any number of the required SRMs inoperable, the ability to monitor is degraded. Therefore, a limited time is allowed to restore the inoperable channels to OPERABLE status.

Providing that at least one SRM remains OPERABLE, Required Action A.1 allows 4 hours to restore the required SRMs to OPERABLE status. This is a reasonable time since there is

(continued)

BASES

ACTIONS

A.1 and B.1 (continued)

adequate capability remaining to monitor the core, limited risk of an event during this time, and sufficient time to take corrective actions to restore the required SRMs to OPERABLE status or to establish alternate IRM monitoring capability. During this time, control rod withdrawal and power increase are not precluded by this Required Action. Having the ability to monitor the core with at least one SRM, proceeding to IRM Range 3 or greater (with overlap required by SR 3.3.1.1.6) and thereby exiting the Applicability of this LCO, is acceptable for ensuring adequate core monitoring and allowing continued operation.

[1] TSTF-264 changes not adopted

With ~~four~~ three [2] required SRMs inoperable, Required Action B.1 allows no positive changes in reactivity (control rod withdrawal must be immediately suspended) due to the inability to monitor the changes. Required Action A.1 still applies and allows 4 hours to restore monitoring capability prior to requiring control rod insertion. This allowance is based on the limited risk of an event during this time, provided that no control rod withdrawals are allowed, and the desire to concentrate efforts on repair, rather than to immediately shut down, with no SRMs OPERABLE.

C.1

In MODE 2 with the IRMs on Range 2 or below [illegible], if the required number of SRMs is not restored to OPERABLE status within the allowed Completion Time, the reactor shall be placed in MODE 3. With all control rods fully inserted, the core is in its least reactive state with the most margin to criticality. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 in an orderly manner and without challenging plant systems.

D.1 and D.2

With one or more required SRM channels inoperable in MODE 3 or 4, the neutron flux monitoring capability is degraded or nonexistent. The requirement to fully insert all insertable control rods ensures that the reactor will be at its minimum reactivity level while no neutron monitoring capability is available. Placing the reactor mode switch in the shutdown

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

position prevents subsequent control rod withdrawal by maintaining a control rod block. The allowed Completion Time of 1 hour is sufficient to accomplish the Required Action, and takes into account the low probability of an event requiring the SRM occurring during this time.

E.1 and E.2

With one or more required SRMs inoperable in MODE 5, the capability to detect local reactivity changes in the core during refueling is degraded. CORE ALTERATIONS must be immediately suspended, and action must be immediately initiated to insert all insertable control rods in core cells containing one or more fuel assemblies. Suspending CORE ALTERATIONS prevents the two most probable causes of reactivity changes, fuel loading and control rod withdrawal, from occurring. Inserting all insertable control rods ensures that the reactor will be at its minimum reactivity, given that fuel is present in the core. Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe, conservative position.

2 fully

Action (once required to be initiated) to insert control rods must continue until all insertable rods in core cells containing one or more fuel assemblies are inserted.

SURVEILLANCE REQUIREMENTS

The SRs for each SRM Applicable MODE or other specified condition are found in the SRs column of Table 3.3.1.2-1.

As noted at the beginning of the SRs, 3

SR 3.3.1.2.1 and SR 3.3.1.2.3

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.1 and SR 3.3.1.2.3 (continued)

something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency of once every 12 hours for SR 3.3.1.2.1 is based on operating experience that demonstrates channel failure is rare. While in MODES 3 and 4, reactivity changes are not expected; therefore, the 12 hour Frequency is relaxed to 24 hours for SR 3.3.1.2.3. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core, one SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant containing fuel. Note 1 states that this SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE, per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is effectively required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities, which include steps to ensure that the SRMs required by the LCO are in the proper quadrant.

3

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate with the detector fully inserted. ~~This ensures that the detectors are indicating count rates indicative of neutron flux levels within the core.~~ With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

[1]

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated quadrant, even with a control rod withdrawn the configuration will not be critical. When movable detectors are being used, detector location must be selected such that each group of fuel assemblies is separated by at least two fuel cells from any other fuel assemblies.

[1]

The Frequency is based upon channel redundancy and other information available in the control room, and ensures that the required channels are frequently monitored while core reactivity changes are occurring. When no reactivity changes are in progress, the Frequency is relaxed from 12 hours to 24 hours.

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. SR 3.3.1.2.5 is required in MODE 5, and the 7 day Frequency ensures that the channels are OPERABLE while core reactivity changes could be in progress. This 7 day Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

[3]

SR 3.3.1.2.6 is required to be met in MODE 2 with IRMs on Range 2 or below and in MODES 3 and 4. Since core reactivity changes do not normally take place in MODES 3 and 4 and core reactivity changes are due only to control rod movement in MODE 2, the Frequency ~~has been~~ is extended from 7 days to 31 days. The 31 day Frequency is based on operating experience and on other Surveillances (such as

[3]

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.5 and SR 3.3.1.2.6 (continued)

5 (CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

Verification of the signal to noise ratio also ensures that the detectors are inserted to a normal operating level. In a fully withdrawn condition, the detectors are sufficiently removed from the fueled region of the core to essentially eliminate neutrons from reaching the detector. Any count rate obtained while fully withdrawn is assumed to be "noise" only.

2 Insert B3.3-41A

SR 3.3.1.2.6 3

The Note to ~~the Surveillance~~ allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 31 day Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. The neutron detectors are excluded from the CHANNEL CALIBRATION (Note 1) 3 because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range, and with an accuracy specified for a fixed useful life.

(continued)

Insert B 3.3-41A

With few fuel assemblies loaded, the SRMs will not have a high enough count rate to determine the signal to noise ratio. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the conditions necessary to determine the signal to noise ratio. To accomplish this, SR 3.3.1.2.5 is modified by a Note that states that the determination of signal to noise ratio is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated quadrant, even with a control rod withdrawn the configuration will not be critical.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.2.7 (continued)

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 18 month 24 2 Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

REFERENCES

None.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.1.2 - SRM INSTRUMENTATION

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

2. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

3. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

4. Changes have been made to more closely reflect the Specification requirements.

5. Typographical/grammatical error corrected.

B 3.3 INSTRUMENTATION

B 3.3.2.1 Control Rod Block Instrumentation

1

BASES

BACKGROUND

Control rods provide the primary means for control of reactivity changes. Control rod block instrumentation includes channel sensors, logic circuitry, switches, and relays that are designed to ensure that specified fuel design limits are not exceeded for postulated transients and accidents. During high power operation, the rod withdrawal limiter (RWL) provides protection for control rod withdrawal error events. During low power operations, control rod blocks from the rod pattern controller (RPC) enforce specific control rod sequences designed to mitigate the consequences of the control rod drop accident (CRDA). During shutdown conditions, control rod blocks from the Reactor Mode Switch—Shutdown Position ensure that all control rods remain inserted to prevent inadvertent criticalities.

The purpose of the RWL is to limit control rod withdrawal to preclude a MCPR Safety Limit (SL) violation. The RWL supplies a trip signal to the Rod Control and Information System (RCIS) to appropriately inhibit control rod withdrawal during power operation equal to or greater than the low power setpoint (LPSP). The RWL has two channels, either of which can initiate a control rod block when the channel output exceeds the control rod block setpoint. The rod block logic circuitry in the RCIS is arranged as two redundant and separate logic circuits. These circuits are energized when control rod movement is allowed. The output of each logic circuit is coupled to a comparator by the use of isolation devices in the rod drive control cabinet. The two logic circuit signals are compared and rod blocks are applied when either circuit trip signal is present. Control rod withdrawal is permitted only when the two signals agree. Each rod block logic circuit receives control rod position indication from a separate channel of the Rod Position Information System, each with a set of reed switches for control rod position indication. Control rod position is the primary data input for the RWL. First stage turbine pressure is used to determine reactor power level, with an LPSP and a high power setpoint (HPSP) used to determine

(continued)

1

BASES

BACKGROUND (continued)

allowable control rod withdrawal distances. Below the LPSP, the RWL is automatically bypassed (Ref. 1).

The purpose of the RPC is to ensure control rod patterns during startup are such that only specified control rod sequences and relative positions are allowed over the operating range from all control rods inserted to 10% RTP. The sequences effectively limit the potential amount and rate of reactivity increase during a CRDA. The RPC, in conjunction with the RCIS, will initiate control rod withdrawal and insert blocks when the actual sequence deviates beyond allowances from the specified sequence. The rod block logic circuitry is the same as that described above. The RPC also uses the turbine first stage pressure to determine when reactor power is above the power at which the RPC is automatically bypassed (Ref. 1).

With the reactor mode switch in the shutdown position, a control rod withdrawal block is applied to all control rods to ensure that the shutdown condition is maintained. This function prevents criticality resulting from inadvertent control rod withdrawal during MODE 3 or 4, or during MODE 5 when the reactor mode switch is required to be in the shutdown position. The reactor mode switch has two channels, with each providing inputs into a separate rod block circuit. A rod block in either circuit will provide a control rod block to all control rods.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Rod Withdrawal Limiter

The RWL is designed to prevent violation of the MCPR SL and the cladding 1% plastic strain fuel design limit that may result from a single control rod withdrawal error (RWE) event. The analytical methods and assumptions used in evaluating the RWE event are summarized in Reference 2. A statistical analysis of RWE events was performed to determine the MCPR response as a function of withdrawal distance and initial operating conditions. From these responses, the fuel thermal performance was determined as a function of RWL allowable control rod withdrawal distance and power level.

(continued)

BASES

1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Rod Withdrawal Limiter (continued)

The RWL satisfies Criterion 3 of the NRC Policy Statement. Two channels of the RWL are available and are required to be OPERABLE to ensure that no single instrument failure can preclude a rod block from this Function.

Nominal trip set points are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Values between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor power), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drive, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

The RWL is assumed to mitigate the consequences of an RWE event when operating > 35% RTP. Below this power level, the consequences of an RWE event will not exceed the MCPR, and therefore the RWL is not required to be OPERABLE (Ref. 3).

1.b. Rod Pattern Controller

The RPC enforces the banked position withdrawal sequence (BPWS) to ensure that the initial conditions of the CRDA analysis are not violated. The analytical methods and assumptions used in evaluating the CRDA are summarized in References 4, 5, and 6. The BPWS requires that control rods be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions. Requirements that the control rod sequence is in

(continued)

BASES

1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b. Rod Pattern Controller (continued)

compliance with BPWS are specified in LCO 3.1.6, "Rod Pattern Control."

The Rod Pattern Controller Function satisfies Criterion 3 of the NRC Policy Statement. Since the RPC is a backup to operator control of control rod sequences, only a single channel would be required OPERABLE to satisfy Criterion 3 (Ref. 6). However, the RPC is designed as a dual channel system and will not function without two OPERABLE channels. Required Actions of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing individual control rods in the Rod Action Control System (RACS) to allow continued operation with inoperable control rods or to allow correction of a control rod pattern not in compliance with the BPWS. The individual control rods may be bypassed as required by the conditions, and the RPC is not considered inoperable provided SR 3.3.2.1.9 is met.

Compliance with the BPWS, and therefore OPERABILITY of the RPC, is required in MODES 1 and 2 with THERMAL POWER ≤ 10% RTP. When THERMAL POWER is > 10% RTP, there is no possible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel damage limit during a CRDA. In MODES 3 and 4, all control rods are required to be inserted in the core. In MODE 5, since only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate SDM ensures that the consequences of a CRDA are acceptable, since the reactor will be subcritical.

2. Reactor Mode Switch—Shutdown Position

During MODES 3 and 4, and during MODE 5 when the reactor mode switch is required to be in the shutdown position, the core is assumed to be subcritical; therefore, no positive reactivity insertion events are analyzed. The Reactor Mode Switch—Shutdown Position control rod withdrawal block ensures that the reactor remains subcritical by blocking control rod withdrawal, thereby preserving the assumptions of the safety analysis.

The Reactor Mode Switch—Shutdown Position Function satisfies Criterion 3 of the NRC Policy Statement.

(continued)

BASES

1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2. Reactor Mode Switch—Shutdown Position (continued)

Two channels are required to be OPERABLE to ensure that no single channel failure will preclude a rod block when required. No Allowable Value is applicable for this Function since the channels are mechanically actuated based solely on reactor mode switch position.

During shutdown conditions (MODE 3, 4, or 5) no positive reactivity insertion events are analyzed because assumptions are that control rod withdrawal blocks are provided to prevent criticality. Therefore, when the reactor mode switch is in the shutdown position, the control rod withdrawal block is required to be OPERABLE. During MODE 5, with the reactor mode switch in the refueling position, the required position one-rod-out interlock (LCO 3.9.2) provides the required control rod withdrawal blocks.

ACTIONS

[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]

A.1

If either RWL channel is inoperable, the RWL may not be capable of performing its intended function. In most cases, with an inoperable channel, the RWL will initiate a control rod withdrawal block because the two channels will not agree. To ensure erroneous control rod withdrawal does not occur, however, Required Action A.1 requires that further control rod withdrawal be suspended immediately.

B.1

If the RPC is inoperable, it may not be capable of performing its intended function even though, in most cases, all control rod movement will be blocked. All control rod movement should be suspended under these conditions until the RPC is restored to OPERABLE status. This action does not preclude a reactor scram. The RPC is not considered

(continued)

BASES

1

ACTIONS

B.1 (continued)

inoperable if individual control rods are bypassed in the RACS as required by LCO 3.1.3 or LCO 3.1.6. Under these conditions, continued operation is allowed if the bypassing of control rods and movement of control rods is verified by a second licensed operator or other qualified member of the technical staff per SR 3.3.2.1.9.

C.1 and C.2

If one Reactor Mode Switch—Shutdown Position control rod withdrawal block channel is inoperable, the remaining OPERABLE channel is adequate to perform the control rod withdrawal block function. Required Action C.1 and Required Action C.2 are consistent with the normal action of an OPERABLE Reactor Mode Switch—Shutdown Position Function to maintain all control rods inserted. Therefore, there is no distinction between Required Actions for the Conditions of one or two channels inoperable. In both cases (one or both channels inoperable), suspending all control rod withdrawal immediately, and immediately fully inserting all insertable control rods in core cells containing one or more fuel assemblies will ensure that the core is subcritical, with adequate SDM ensured by LCO 3.1.1, "SHUTDOWN MARGIN (SDM)." Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and are therefore not required to be inserted. Action must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted.

SURVEILLANCE REQUIREMENTS

[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]

As noted at the beginning of the SR, the SRs for each Control Rod Block Instrumentation Function are found in the SRs column of Table 3.3.2.1-1.

The Surveillances are also modified by a Note to indicate that when an RWL channel is placed in an inoperable status solely for performance of required Surveillances, entry into

(continued)

BASES

1

SURVEILLANCE REQUIREMENTS (continued)

associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains control rod block capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 8) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary.

SR 3.3.2.1.1, SR 3.3.2.1.2, SR 3.3.2.1.3, and SR 3.3.2.1.4

The CHANNEL FUNCTIONAL TESTS for the RPC and RWL are performed by attempting to withdraw a control rod not in compliance with the prescribed sequence and verifying that a control rod block occurs. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. As noted, the SRs are not required to be performed until 1 hour after specified conditions are met (e.g., after any control rod is withdrawn in MODE 2). This allows entry into the appropriate conditions needed to perform the required SRs. The Frequencies are based on reliability analysis (Ref. 7).

SR 3.3.2.1.5

The LPSP is the point at which the RPCS makes the transition between the function of the RPC and the RWL. This transition point is automatically varied as a function of power. This power level is inferred from the first stage turbine pressure (one channel to each trip system). These power setpoints must be verified periodically to be within the Allowable Values. If any LPSP is nonconservative, then the affected Functions are considered inoperable. Since this channel has both upper and lower required limits, it is not allowed to be placed in a condition to enable either the RPC or RWL Function. Because main turbine bypass steam flow can affect the LPSP nonconservatively for the RWL, the RWL is considered inoperable with any main turbine bypass valves

(continued)

BASES

1

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.5 (continued)

open. The Frequency of 92 days is based on the setpoint methodology utilized for these channels.

SR 3.3.2.1.6

This SR ensures the high power function of the RWL is not bypassed when power is above the HPSP. The power level is inferred from turbine first stage pressure signals. Periodic testing of the HPSP channels is required to verify the setpoint to be less than or equal to the limit. Adequate margins in accordance with setpoint methodologies are included. If the HPSP is nonconservative, then the RWL is considered inoperable. Alternatively, the HPSP can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWL would not be considered inoperable. Because main turbine bypass steam flow can affect the HPSP nonconservatively for the RWL, the RWL is considered inoperable with any main turbine bypass valve open. The Frequency of 92 days is based on the setpoint methodology utilized for these channels.

SR 3.3.2.1.7

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.2.1.8

The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch—Shutdown Position Function is performed by attempting to

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.8 (continued)

withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable limits. This allows entry into MODES 3 and 4 if the 18 month Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

SR 3.3.2.1.9

LCO 3.1.3 and LCO 3.1.6 may require individual control rods to be bypassed in RACS to allow insertion of an inoperable control rod or correction of a control rod pattern not in compliance with BPWS. With the control rods bypassed in the RACS, the RPC will not control the movement of these bypassed control rods. To ensure the proper bypassing and movement of those affected control rods, a second licensed operator or other qualified member of the technical staff must verify the bypassing and movement of these control rods. Compliance with this SR allows the RPC to be OPERABLE with these control rods bypassed.

REFERENCES

1. FSAR, Section [7.6.1.7.3].
2. FSAR, Section [15.4.2].

(continued)

1

BASES

REFERENCES (continued)

3. NEDE-24011-P-A-9-US, "General Electrical Standard Application for Reload Fuel," Supplement for United States, Section S 2.2.3.1, September 1988.

4. "Modifications to the Requirements for Control Rod Drop Accident Mitigating Systems," BWR Owners Group, July 1986.

5. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.

6. NRC SER, Acceptance of Referencing of Licensing Topical Report NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel, Revision 8, Amendment 17," December 27, 1987.

7. NEDC-30851-P-A, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

8. GENE-770-06-1, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

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INSERT B 3.3.2.1 (BWR/4 ISTS B3.3.2.1)

1

1 INSERT BWR/4 ISTS B 3.3.2.1 *

B 3.3 INSTRUMENTATION

B 3.3.2.1 Control Rod Block Instrumentation

BASES

BACKGROUND

Control rods provide the primary means for control of reactivity changes. Control rod block instrumentation includes channel sensors, logic circuitry, switches, and relays that are designed to ensure that specified fuel design limits are not exceeded for postulated transients and accidents. During high power operation, the rod block monitor (RBM) provides protection for control rod withdrawal error events. During low power operations, control rod blocks from the rod worth minimizer (RWM) enforce specific control rod sequences designed to mitigate the consequences of the control rod drop accident (CRDA). During shutdown conditions, control rod blocks from the Reactor Mode Switch—Shutdown Position Function ensure that all control rods remain inserted to prevent inadvertent criticalities.

The purpose of the RBM is to limit control rod withdrawal if localized neutron flux exceeds a predetermined setpoint (Ref. 1) 2 during control rod manipulations. It is assumed to function to block further control rod withdrawal to preclude a MCPR Safety Limit (SL) violation. The RBM supplies a trip signal to the Reactor Manual Control System (RMCS) to appropriately inhibit control rod withdrawal during power operation above the ~~low power range~~ 30% RATED THERMAL POWER 2 setpoint when a non peripheral control rod is selected 2. The RBM has two channels, either of which can initiate a control rod block when the channel output exceeds the control rod block setpoint. One RBM channel inputs into one RMCS rod block circuit and the other RBM channel inputs into the second RMCS rod block circuit. The RBM channel signal is generated by averaging a set of local power range monitor (LPRM) signals ~~at various core heights surrounding the control rod being withdrawn. A signal from one average power range monitor (APRM) channel assigned to each Reactor Protection System (RPS) trip system supplies a reference signal for the RBM channel in the same trip system. This reference signal is used to determine which RBM range setpoint (low, intermediate, or high) is enabled. If the APRM is indicating less than the low power range setpoint, the RBM is automatically bypassed. The RBM is also automatically bypassed if a peripheral control rod is selected (Ref. 1).~~

2 INSERT BKGRD

(continued)

* This BWR/4 Bases Insert was used to match the BWR/4 Specification inserted in the LCO Section

Insert Page B 3.3-52a

Insert BKGRD

One RBM channel averages the signals from LPRM detectors at the A and C positions in the assigned LPRM assemblies. The second RBM channel averages the signals from the LPRM detectors at the B and D positions. Assignment of LPRM assemblies to be used in RBM averaging is controlled by the selection of control rods. With no control rod selected, the RBM output is set to zero. However, when a control rod is selected, the gain of each RBM channel output is normalized to an assigned average power range monitor (APRM) channel. The assigned APRM channel is on the same RPS trip system as the RBM channel. The gain setting is held constant during the movement of that particular control rod to provide an indication of the change in the relative local power level. If the APRM used to normalize the RBM reading is indicating < 30% or a peripheral control rod is selected, the RBM is zeroed and the RBM is bypassed (Refs. 1 and 2).

If any LPRM detector assigned to an RBM is bypassed, the computed average signal is adjusted automatically to compensate for the number of LPRM signals. The minimum number of LPRM inputs required for each RBM channel to prevent an instrument inoperative alarm is four when using four LPRM assemblies, three when using three LPRM assemblies, and two when using two LPRM assemblies. If the normalizing APRM channel is bypassed, a second APRM channel automatically provides the normalizing signal (Refs. 1 and 2).

In addition, to preclude rod movement with an inoperable RBM, a downscale trip and an inoperable trip are provided.

BASES

BACKGROUND (continued)

The purpose of the RWM is to control rod patterns during startup and shutdown 2 such that only specified control rod sequences and relative positions are allowed over the operating range from all control rods inserted to 10% RTP. The sequences effectively limit the potential amount and rate of reactivity increase during a CRDA. Prescribed control rod sequences are stored in the RWM, which will initiate control rod withdrawal and insert blocks when the actual sequence deviates beyond allowances from the stored sequence. The RWM determines the actual sequence based on 7 position indication for each control rod. The RWM also uses ~~feedwater flow and~~ 2 steam flow signals to determine when the reactor power is above the preset power level at which the RWM is automatically bypassed ~~(Ref. 2)~~. 2 The RWM is a single channel system that provides input into both RMCS rod block circuits (Refs. 2 and 3) 2.

With the reactor mode switch in the shutdown position, a control rod withdrawal block is applied to all control rods to ensure that the shutdown condition is maintained. This Function prevents inadvertent criticality as the result of a control rod withdrawal during MODE 3 or 4, or during MODE 5 when the reactor mode switch is required to be in the shutdown position. The reactor mode switch has two channels, each inputting into a separate RMCS rod block circuit. Each reactor mode switch channel has contacts permitting control rod withdrawal in the reactor mode switch positions of Run, Startup, and Refuel interlocked with other plant conditions. With the reactor mode switch in Shutdown, the RMCS circuits do not receive a permissive for control rod withdrawal. 2 A rod block in either RMCS circuit will provide a control rod block to all control rods.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Rod Block Monitor

The RBM is designed to prevent violation of the MCPR SL and the cladding 1% plastic strain fuel design limit that may result from a single control rod withdrawal error (RWE) event. The analytical methods and assumptions used in evaluating the RWE event are summarized in Reference ~~3~~ 4 2. ~~A statistical analysis of RWE events was performed to determine the RBM response for both channels for each event. From these responses, the fuel thermal performance as a function of RBM Allowable Value was determined. The Allowable Values are chosen as a function of power level. Based on the specified Allowable Values, operating limits are established.~~ 2

Insert ASA-1 2

(continued)

Insert Page B 3.3-52c

INSERT ASA-1

The cycle-specific analysis considers the continuous withdrawal of the maximum worth control rod at its maximum drive speed from the reactor, which is operating at rated power with a control rod pattern that results in the core being placed on thermal design limits. The condition is analyzed to ensure that the results obtained are conservative; the approach also serves to demonstrate the function of the RBM.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY 2

1. Rod Block Monitor (continued)

10 CFR 50.36(c)(2)(ii) 2

The RBM Function satisfies Criterion 3 of the NRC Policy Statement.

Two channels of the RBM are required to be OPERABLE, with their setpoints within the appropriate Allowable Values for ~~the associated power range,~~ to ensure that no single instrument failure can preclude a rod block from this Function. The actual setpoints are calibrated consistent with applicable setpoint methodology.

Specified in the CORE OPERATING LIMITS REPORT

(s) 2

Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Values between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor power), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

2 INSERT ASA-2

2

The RBM is assumed to mitigate the consequences of an RWE event when operating ≥ ~~29%~~ 30 RTP 2 and a non-peripheral control rod is selected. Below this power level, the consequences of an RWE event will not exceed the MCPR SL and, therefore, the RBM is not required to be OPERABLE or if a peripheral control rod is selected 2 (Ref. ~~3~~ 4 2). ~~When operating < 90% RTP, analyses (Ref. 3) have shown that with an initial MCPR ≥ 1.70, no RWE event will result in exceeding the MCPR SL. Also, the analyses demonstrate that when operating at ≥ 90% RTP with MCPR ≥ 1.40, no RWE event will result in exceeding the MCPR~~ 2

(continued)

Insert Page B 3.3-52e

Insert BWR/4 ISTS B 3.3.2.1 (continued)

Insert ASA-2

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2

~~1. Rod Block Monitor (continued)~~

~~SL (Ref. 3). Therefore, under these conditions, the RBM is also not required to be OPERABLE.~~

2. Rod Worth Minimizer

analyzed rod position

2

The RWM enforces the ~~banked position withdrawal~~ sequence ~~(BPWS)~~ to ensure that the initial conditions of the CRDA analysis are not violated. The analytical methods and assumptions used in evaluating the CRDA are summarized in References 4, 5, 6, and 7. The BPWS requires that control rods be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions. Requirements that the control rod sequence is in compliance with the BPWS are specified in LCO 3.1.6, "Rod Pattern Control."

analyzed rod position sequence

The RWM Function satisfies Criterion 3 of ~~the NRC Policy Statement~~.

10 CFR 50.36(c)(2)(ii) 2

2 Since the RWM is a hardwired system designed to act as a backup to operator control of the rod sequences, only one channel of the RWM is available and required to be OPERABLE (Ref. 7). Special circumstances provided for in the Required Action of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing the RWM to allow continued operation with inoperable control rods, or to allow correction of a control rod pattern not in compliance with the BPWS. The RWM may be bypassed as required by these conditions, but then it must be considered inoperable and the Required Actions of this LCO followed.

2

analyzed rod position sequence

Compliance with the BPWS, and therefore OPERABILITY of the RWM, is required in MODES 1 and 2 when THERMAL POWER is

7 ≤

≤ 10% RTP. When THERMAL POWER is > 10% RTP, there is no possible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel ~~damage~~ limit during a CRDA (Refs. 8 and 7). In MODES 3 and 4, all control rods are required to be inserted into the core; therefore, a CRDA cannot occur. In MODE 5, since only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate SDM ensures that the consequences of a CRDA are acceptable, since the reactor will be subcritical.

2 6

2 design

(continued)

Insert Page B 3.3-52g

1 INSERT BWR/4 ISTS B 3.3.2.1 (continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued) 3

3. Reactor Mode Switch—Shutdown Position

During MODES 3 and 4, and during MODE 5 when the reactor mode switch is ~~required to be~~ in the shutdown position, the core is assumed to be subcritical; therefore, no positive reactivity insertion events are analyzed. The Reactor Mode Switch—Shutdown Position control rod withdrawal block ensures that the reactor remains subcritical by blocking control rod withdrawal, thereby preserving the assumptions of the safety analysis.

The Reactor Mode Switch—Shutdown Position Function satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii) 2

Two channels are required to be OPERABLE to ensure that no single channel failure will preclude a rod block when required. There is no Allowable Value for this Function since the channels are mechanically actuated based solely on reactor mode switch position.

2 During shutdown conditions (MODE ~~3,~~ 3 and 4, ~~or~~ and MODE 5 2 when the reactor mode switch is in the shutdown position 2), no positive reactivity insertion events are analyzed because assumptions are that control rod withdrawal blocks are provided to prevent criticality. Therefore, when the reactor mode switch is in the shutdown position, the control rod withdrawal block is required to be OPERABLE. During MODE 5 with the reactor mode switch in the refueling position, the refuel position one-rod-out interlock (LCO 3.9.2), "Refuel Position One-Rod-Out Interlock" 5 provides the required control rod withdrawal blocks.

ACTIONS

4 ~~Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for the licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.~~

A.1

With one RBM channel inoperable, the remaining OPERABLE channel is adequate to perform the control rod block function; however, overall reliability is reduced because a single failure in the remaining OPERABLE channel can result in no control rod block capability for the RBM. For this

(continued)

Insert Page B 3.3-52h

ACTIONS

A.1 (continued)

reason, Required Action A.1 requires restoration of the inoperable channel to OPERABLE status. The Completion Time of 24 hours is based on the low probability of an event occurring coincident with a failure in the remaining OPERABLE channel.

B.1

If Required Action A.1 is not met and the associated Completion Time has expired, the inoperable channel must be placed in trip within 1 hour. If both RBM channels are inoperable, the RBM is not capable of performing its intended function; thus, one channel must also be placed in trip. This initiates a control rod withdrawal block, thereby ensuring that the RBM function is met.

The 1 hour Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities and is acceptable because it minimizes risk while allowing time for restoration or tripping of inoperable channels.

C.1, C.2.1.1, C.2.1.2, and C.2.2

5 These requirements minimize the number of reactor startups initiated with the RWM inoperable.

With the RWM inoperable during a reactor startup, the operator is still capable of enforcing the prescribed control rod sequence. However, the overall reliability is reduced because a single operator error can result in violating the control rod sequence. Therefore, control rod movement must be immediately suspended except by scram. Alternatively, startup may continue if at least 12 control rods have already been withdrawn, or a reactor startup with an inoperable RWM was not performed in the last 12 months.

3 during withdrawal of one or more of the first 12 control rods

3 calendar year (i.e., the current calendar year)

Required Actions C.2.1.1 and C.2.1.2 require verification of these conditions by review of plant logs and control room indications. Once Required Action C.2.1.1 or C.2.1.2 is satisfactorily completed, control rod withdrawal may proceed in accordance with the restrictions imposed by Required Action C.2.2. Required Action C.2.2 allows for the RWM Function to be performed manually and requires a double check of compliance with the prescribed rod sequence by a second licensed operator (Reactor Operator or Senior Reactor Operator) or other qualified member of the technical staff.

2 task

2 (e.g., shift technical advisor or reactor engineer)

(continued)

Insert Page B 3.3-52i

1 INSERT BWR/4 ISTS B 3.3.2.1 (continued)

BASES

ACTIONS

C.1, C.2.1.1, C.2.1.2, and C.2.2 (continued)

The RWM may be bypassed under these conditions to allow continued operations. In addition, Required Actions of LCO 3.1.3 and LCO 3.1.6 may require bypassing the RWM, during which time the RWM must be considered inoperable with Condition C entered and its Required Actions taken.

D.1

With the RWM inoperable during a reactor shutdown, the operator is still capable of enforcing the prescribed control rod sequence. Required Action D.1 allows for the RWM Function to be performed manually and requires a double check of compliance with the prescribed rod sequence by a second licensed operator (Reactor Operator or Senior Reactor Operator) or other task qualified member of the technical staff (e.g., shift technical advisor or reactor engineer). The RWM may be bypassed under these conditions to allow the reactor shutdown to continue.

2 2

E.1 and E.2

With one Reactor Mode Switch—Shutdown Position control rod withdrawal block channel inoperable, the remaining OPERABLE channel is adequate to perform the control rod withdrawal block function. However, since the Required Actions are consistent with the normal action of an OPERABLE Reactor Mode Switch—Shutdown Position Function (i.e., maintaining all control rods inserted), there is no distinction between having one or two channels inoperable.

In both cases (one or both channels inoperable), suspending all control rod withdrawal and initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies will ensure that the core is subcritical with adequate SDM ensured by LCO 3.1.1. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and are therefore not required to be inserted. Action must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted.

(continued)

Insert Page B 3.3-52j

1 INSERT BWR/4 ISTS B3.3.2.1 (continued)

SURVEILLANCE REQUIREMENTS

~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~ 4

As noted at the beginning of the SRs, the SRs for each Control Rod Block instrumentation Function are found in the SRs column of Table 3.3.2.1-1.

The Surveillances are modified by a second Note to indicate that when an RBM channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains control rod block capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. ~~8~~ 8) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that a control rod block will be initiated when necessary. 2

SR 3.3.2.1.1

A CHANNEL FUNCTIONAL TEST is performed for each RBM channel to ensure that the entire channel will perform the intended function. It includes the Reactor Manual Control Multiplexing System input.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The Frequency of 92 days is based on reliability analyses (Ref. ~~8~~ 9). 2

SR 3.3.2.1.2 and SR 3.3.2.1.3

A CHANNEL FUNCTIONAL TEST is performed for the RWM to ensure that the entire system will perform the intended function. The CHANNEL FUNCTIONAL TEST for the RWM is performed by attempting to withdraw a control rod not in compliance with

(continued)

Insert Page B 3.3-52k

1 INSERT BWR/4 ISTS B 3.3.2.1 (continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.2 and SR 3.3.2.1.3 (continued)

2 and by verifying proper annunciation of the selection error of at least one out-of-sequence control rod

the prescribed sequence and verifying a control rod block occurs. As noted in the SRs, SR 3.3.2.1.2 is not required to be performed until 1 hour after any control rod is withdrawn in MODE 2. ~~As noted,~~ SR 3.3.2.1.3 is not required to be performed until 1 hour after THERMAL POWER is ≤ 10% RTP in MODE 1. This allows entry into MODE 2 for SR 3.3.2.1.2, and ~~entry into MODE 1 when~~ THERMAL POWER ~~is~~ ≤ 10% RTP for SR 3.3.2.1.3, to perform the required Surveillance if the 92 day Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs. ~~The Frequencies are based on reliability analysis (Ref. 8).~~

3 at ≤ 10% RTP

3 in MODE 1

7 S

5 and 3

(and if entering during a shutdown concurrent with a power reduction to ≤ 10% RTP)

reduction to 3

Insert SR 3.3.2.1.2 2

6 INSERT SR 3.3.2.1.4 from pages B 3.3-53 and B 3.3-54

SR 3.3.2.1.~~4~~ 5 6

2 INSERT SR 3.3.2.1.5

~~The RBM setpoints are automatically varied as a function of power. Three Allowable Values are specified in Table 3.3.2.1-1, each within a specific power range. The power at which the control rod block Allowable Values automatically change are based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. These power Allowable Values must be verified periodically to be less than or equal to the specified values.~~ If any ~~power range~~ bypass setpoint is nonconservative, then the affected RBM channel is considered inoperable. Alternatively, the ~~power range~~ APRM channel can be placed in the conservative condition ~~(i.e., enabling the proper RBM setpoint)~~ to enable the RBM. If placed in this condition, the SR is met and the RBM channel is not considered inoperable. As noted, neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.8. The ~~18~~ 24 month Frequency is based on the actual trip setpoint methodology utilized for these channels. 9

2

SR 3.3.2.1.~~5~~ 6 6

The RWM is automatically bypassed when power is above a specified value. The power level is determined from ~~feedwater flow and~~ steam flow signal~~s~~. The automatic bypass 2

(continued)

Insert Page B 3.3-52I

INSERT SR 3.3.2.1.2

Operating experience has shown that these components usually pass the Surveillance when performed at the 92 day Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Insert SR 3.3.2.1.5

is automatically bypassed when power is below a specified value or if a peripheral control rod is selected. The power level is determined from the APRM signals input to each RBM channel. The automatic bypass setpoint must be verified periodically to be <30% RTP. In addition, it must also be verified that the RBM is not bypassed when a control rod that is not a peripheral control rod is selected (only one non-peripheral control rod is required to be verified).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.5 6 6 (continued)

setpoint must be verified periodically to be ≤ > 3 10% RTP. 8 If the RWM low power setpoint is nonconservative, then the RWM is considered inoperable. Alternately, the low power setpoint channel can be placed in the conservative condition (nonbypass). If placed in the nonbypassed condition, the SR is met and the RWM is not considered inoperable. The Frequency is based on the trip setpoint methodology utilized for the low power setpoint channel.

SR 3.3.2.1.6 7 6

A CHANNEL FUNCTIONAL TEST is performed for the Reactor Mode Switch—Shutdown Position Function to ensure that the entire channel will perform the intended function. The CHANNEL FUNCTIONAL TEST for the Reactor Mode Switch—Shutdown Position Function is performed by attempting to withdraw any control rod with the reactor mode switch in the shutdown position and verifying a control rod block occurs.

As noted in the SR, the Surveillance is not required to be performed until 1 hour after the reactor mode switch is in the shutdown position, since testing of this interlock with the reactor mode switch in any other position cannot be performed without using jumpers, lifted leads, or movable links. This allows entry into MODES 3 and 4 if the 18 24 9 month Frequency is not met per SR 3.0.2. The 1 hour allowance is based on operating experience and in consideration of providing a reasonable time in which to complete the SRs.

The 18 24 9 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 24 9 month Frequency.

6 MOVE TO Bases Page B 3.3-52

SR 3.3.2.1.7 4 6

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel

(continued)

Insert Page B 3.3-52n

1 INSERT BWR/4 ISTS B 3.3.2.1 (continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.1.~~8~~ 4 6 (continued)

6 MOVE TO BASES Page B. 3.3-52a

adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

As noted, neutron detectors are excluded from the CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.8.

The Frequency is based upon the assumption of an ~~18 month~~ 92 day 9 calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

9 Insert SR 3.3.2.1.9

SR 3.3.2.1.8

The RWM will only enforce the proper control rod sequence if the rod sequence is properly input into the RWM computer. This SR ensures that the proper sequence is loaded into the RWM so that it can perform its intended function. The Surveillance is performed once prior to declaring RWM OPERABLE following loading of sequence into RWM, since this is when rod sequence input errors are possible.

REFERENCES

2

1. U FSAR, Section ~~7.6.2.2.5~~ 7.7.6.3 8.
2. FSAR, Section ~~7.6.8.2.5~~ 7.7.2.2.3 8.
3. ~~NEDC-30474-P, "Average Power Range Monitor, Rod Block Monitor, and Technical Specification Improvements (ARTS) Program for Edwin I. Hatch Nuclear Plants," December 1983.~~
4. ~~NEDE-24011-P-A-9-US, "General Electrical Standard Application for Reload Fuel," Supplement for United States, Section S 2.2.3.1, September 1988.~~
~~5.~~ 6. "Modifications to the Requirements for Control Rod Drop Accident Mitigating Systems," BWR Owners' Group, July 1986.

(continued)

3. UFSAR, Section 7.7.7.2.3.
4. UFSAR, Section 15.4.2.3.
5. UFSAR, Section 15.4.9.

Insert Page B 3.3-52a

Insert SR 3.3.2.1.9

SR 3.3.2.1.9

LCO 3.1.3 and LCO 3.1.6 may require individual control rods to be bypassed in the RWM to allow insertion of an inoperable control rod or correction of a control rod pattern not in compliance with the analyzed rod position sequence. With the control rods bypassed in the RWM, the RWM will not control the movement of these bypassed control rods. To ensure the proper bypassing and movement of these affected control rods, a second licensed operator (Reactor Operator or Senior Reactor Operator) or other task qualified member of the technical staff (e.g., shift technical advisor or reactor engineer) must verify the bypassing and position of these control rods. Compliance with this SR allows the RWM to be OPERABLE with these control rods bypassed.

1 INSERT BWR/4 ISTS B 3.3.2.1 (continued)

BASES

REFERENCES (continued)

6. ~~NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.~~ 2

7. NRC SER, "Acceptance of Referencing of Licensing Topical Report NEDE-24011-P-A," "General Electric Standard Application for Reactor Fuel, Revision 8, Amendment 17," December 27, 1987.

2

~~8.~~ 9. NEDC-30851-P-A, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988. -A 2

~~9.~~ 8. GENE-770-06-1, "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991. December 1992 2

10 Insert B 3.3.2.2 (BWR/4 ISTS B 3.3.2.2)

Insert Page B 3.3-52q

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.2.1 - CONTROL ROD BLOCK INSTRUMENTATION

1. The BWR/6 ISTS, NUREG-1434, Rev. 1 Bases for the Control Rod Block Instrumentation has been replaced with the BWR/4 ISTS, NUREG-1433, Rev. 1 Bases, since the LaSalle 1 and 2 design is essentially the same as the BWR/4 design. Any deviations from the BWR/4 Bases are discussed separately below.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

3. Changes have been made to more closely reflect the Specification requirements.

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

5. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

6. The discussion of this SR has been moved to the proper location, consistent with the Writer's Guide. The following requirements have been renumbered, where applicable, to reflect this change.

7. Typographical/grammatical error corrected.

8. The brackets have been removed and the proper plant specific information/value has been provided.

9. Changes have been made to reflect those changes made to the Specification.

10. A new Bases has been added, ITS Bases 3.3.2.2. This Bases is from the BWR/4 ISTS (NUREG-1433 ISTS B 3.3.2.2), since the LaSalle 1 and 2 design is similar to the BWR/4 design with regard to the Feedwater System and Main Turbine High Water Level Trip Instrumentation. Therefore, the BWR/4 Bases is used and any deviations from the BWR/4 ISTS Bases are discussed in the Justification for Deviations for ITS Bases: 3.3.2.2.

Insert BWR/4 3.3.2.2* [1]

System [2]

B 3.3 INSTRUMENTATION

B 3.3.2.2 Feedwater and Main Turbine High Water Level Trip Instrumentation

BASES

System [2]

BACKGROUND

The feedwater and main turbine high water level trip instrumentation is designed to detect a potential failure of the Feedwater Level Control System that causes excessive feedwater flow. [4]

With excessive feedwater flow, the water level in the reactor vessel rises toward the high water level, Level 8 reference point, causing the trip of the two feedwater pump turbines and the main turbine.

, the motor-driven feedwater pump

Reactor Vessel Water Level—High, Level 8 signals are provided by level sensors that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level in the reactor vessel (variable leg). ~~Three~~ channels of Reactor Vessel Water Level—High, Level 8 instrumentation are provided as input to ~~a two-out-of-three~~ initiation logic that trips the two feedwater pump turbines and the main turbine. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a main feedwater and turbine trip signal to the trip logic. [3]

differential pressure transmitters

Four

the

Insert BKGD

system

A trip of the feedwater pump turbines limits further increase in reactor vessel water level by limiting further addition of feedwater to the reactor vessel. A trip of the main turbine and closure of the stop valves protects the turbine from damage due to water entering the turbine.

and the motor-driven feedwater pump

System [4] [3]

APPLICABLE SAFETY ANALYSES

The feedwater and main turbine high water level trip instrumentation is assumed to be capable of providing a turbine trip in the design basis transient analysis for a feedwater controller failure, maximum demand event (Ref. 1). The Level 8 trip indirectly initiates a reactor scram from the main turbine trip (above 30% RTP) and trips the feedwater pumps, thereby terminating the event. The reactor scram mitigates the reduction in MCPR.

trip of the

feedwater turbines, the motor-driven feedwater pump, and the main [3]

25 [3]

(continued)

* This BWR/4 Bases Insert was used to match the BWR/4 Specification inserted in the LCO Section

Insert Page B 3.3-52r

Insert BKGD

Trip channels A and B each receive an input from Reactor Vessel Water Level—High, Level 8 channels and trip channel C receives an input from two Reactor Vessel Water Level—High, Level 8 channels. Trip channel C has one instrument that shares the same narrow range variable leg with trip channel A, and a second instrument that shares the narrow range variable leg with the instrument of trip channel B. Each of the trip channels will trip if any Reactor Vessel Water Level—High, Level 8 channel trips. Each of the three trip channel outputs are provided as inputs to the individual trip logics associated with each feedwater pump turbine, the motor-driven feedwater pump, and the main turbine. The trip channel inputs are arranged in a two-out-of-three logic for each initiation logic.

Insert BWR/4 ISTS 3.3.2.2 1
(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Feedwater and main turbine high water level trip instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). 4 3

LCO

The LCO requires ~~three~~ four channels (combined into three trip channels) of the Reactor Vessel Water Level—High, Level 8 instrumentation to be OPERABLE to ensure that no single instrument failure or variable leg failure will prevent the feedwater pump turbines, the motor-driven feedwater pump, and main turbine trip on a valid Level 8 signal. Two of the three channels are needed to trip to provide trip signals in order for the feedwater and main turbine, and motor-driven feedwater pump trips to occur. Each channel must have its setpoint set within the specified Allowable Value of SR 3.3.2.2.3. The Allowable Value is set to ensure that the thermal limits are not exceeded during the event. The actual setpoint is calibrated to be consistent with the applicable setpoint methodology assumptions. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. 3

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration process, and some of the instrument errors.~~ A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. ~~The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~ 4

3 Insert LCO

(continued)

Insert Page B 3.3-52t

Insert LCO

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

Insert BWR/4 ISTS 3.3.2.2 1

(continued)

System 2

BASES (continued)

APPLICABILITY

The feedwater and main turbine high water level trip instrumentation is required to be OPERABLE at ≥ 25% RTP to ensure that the fuel cladding integrity Safety Limit and the cladding 1% plastic strain limit are not violated during the feedwater controller failure, maximum demand event. As discussed in the Bases for LCO 3.2.1, "Average Planar Linear Heat Generation Rate (APLHGR)," and LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," sufficient margin to these limits exists below 25% RTP; therefore, these requirements are only necessary when operating at or above this power level. 4

and LCO 3.2.3, "LINEAR HEAT GENERATION RATE," 3

ACTIONS

A Note has been provided to modify the ACTIONS related to feedwater and main turbine high water level trip instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable feedwater and main turbine high water level trip instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable feedwater and main turbine high water level trip instrumentation channel. 4

System 2

A.1

or more 2

and trip capability maintained 2

or a variable leg failure, 3

With one channel inoperable, the remaining ~~two~~ OPERABLE channels can provide the required trip signal. However, overall instrumentation reliability is reduced because a single failure in one of the remaining channels concurrent with feedwater controller failure, maximum demand event, may result in the instrumentation not being able to perform its intended function. Therefore, continued operation is only allowed for a limited time ~~with one channel inoperable~~. If the inoperable channel cannot be restored to OPERABLE status within the Completion Time, the channel must be placed in the tripped condition per Required Action A.1. Placing the 2

(continued)

Insert Page B 3.3-52v

Insert BWR/4 ISTS 3.3.2.2 [1]

(continued)

System [2]

BASES

ACTIONS

A.1 (continued)

turbine, motor-driven feedwater pump, [3]

inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue with no further restrictions. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in a feedwater or main turbine trip), Condition C must be entered and its Required Action taken.

The Completion Time of 7 days is based on the low probability of the event occurring coincident with a single failure in a remaining OPERABLE channel.

B.1

[2] the feedwater system and main turbine high water level trip capability not maintained

system

With ~~two or more channels inoperable~~, the feedwater and main turbine high water level trip instrumentation cannot perform its design function ~~(feedwater and main turbine high water level trip capability is not maintained)~~. Therefore, continued operation is only permitted for a 2 hour period, during which feedwater ~~and main turbine high water level~~ system trip capability must be restored. The trip capability is considered maintained when sufficient channels are OPERABLE or in trip such that the feedwater ~~and main turbine high~~ water level trip logic will generate a trip signal on a valid signal. This requires two channels ~~to each be~~ OPERABLE or in trip. If the required channels cannot be restored to OPERABLE status or placed in trip, Condition C must be entered and its Required Action taken.

[3] of the three trip

have one feedwater system and main turbine high water level channel [3]

The 2 hour Completion Time is sufficient for the operator to take corrective action, and takes into account the likelihood of an event requiring actuation of feedwater System [2] and main turbine high water level trip instrumentation occurring during this period. [4] It is also consistent with the 2 hour Completion Time provided in LCO 3.2.2 for Required Action A.1, since this instrumentation's purpose is to preclude a MCPR violation.

(continued)

Insert Page B 3.3-52W

Insert BWR/4 ISTS 3.3.2.2 [1]

(continued)

System [2]

BASES

ACTIONS (continued)

[2] Alternatively, if a channel is inoperable solely due to an inoperable motor-driven feedwater pump breaker or feedwater stop valve, the affected feedwater pump(s) may be removed from service since this performs the intended function of the instrumentation

C.1 and C.2 [2]

With the ~~required~~ channel(s) not restored to OPERABLE status or placed in trip, THERMAL POWER must be reduced to < 25% RTP within 4 hours. As discussed in the Applicability section of the Bases, operation below 25% RTP results in sufficient margin to the required limits, and the feedwater System and main turbine high water level trip instrumentation is not required to protect fuel integrity during the feedwater controller failure, maximum demand event. The allowed Completion Time of 4 hours is based on operating experience to reduce THERMAL POWER to < 25% RTP from full power conditions in an orderly manner and without challenging plant systems. [5] [2] [4]

SURVEILLANCE REQUIREMENTS

[6] ~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies the licensee must justify the Frequencies as required by the staff Safety Evaluation Report (SER) for the topical report.~~

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the ~~associated~~ Function maintains feedwater System and main turbine high water level trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 2) assumption that 6 hours is the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the feedwater pump turbines (3) motor-driven feedwater pumps and main turbine will trip when necessary. [4] [2] [3]

SR 3.3.2.2.1

Performance of the CHANNEL CHECK once every ~~24~~ 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter [2]

(continued)

Insert Page B 3.3-52x

Insert BWR/4 ISTS 3.3.2.2 [1]
(continued)

System [2]

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.2.1 (continued)

indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels, or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limits.

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

SR 3.3.2.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. [4]

The Frequency of 92 days is based on reliability analysis (Ref. 2).

SR 3.3.2.2.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive

(continued)

Insert Page B 3.3-52y

Insert BWR/4 ISTS 3.3.2.2 [1]

(continued)

System [2]

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.2.3 (continued)

calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of a ~~n~~ ~~18~~ 24 [2] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.2.2.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the feedwater and main turbine stop [3] valves and the motor-driven feedwater pump breaker [3] is included as part of this Surveillance and overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a turbine stop valve or motor feedwater pump breaker [3] is incapable of operating, the associated instrumentation would also be inoperable. The ~~18~~ 24 [2] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the ~~18~~ 24 [2] month Frequency.

REFERENCES

[3] 1. 4 FSAR, Section ~~1~~15.1.2A [7] ~~X~~.

2. GENE-770-06-1-A [3], "Bases for Changes to Surveillance Test Intervals and Allowed Out-Of-Service Times for Selected Instrumentation Technical Specifications," ~~February 1991~~ December 1992 [3]. [3]

Insert Page B 3.3-52z

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.2.2 - FEEDWATER SYSTEM AND MAIN TURBINE HIGH WATER LEVEL TRIP INSTRUMENTATION

1. A new Bases Section has been added, ITS Bases 3.3.2.2. This Bases is from the BWR/4 ISTS (NUREG-1433, Rev. 1), since the LaSalle 1 and 2 design is similar to the BWR/4 design with regards to the feedwater system and main turbine high water level trip instrumentation. Therefore, the BWR/4 ISTS Bases is used and any deviations from the BWR/4 ISTS Bases are discussed below.

2. Changes have been made to reflect those changes made to the Specification.

3. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, analysis description, or licensing basis description.

4. Editorial change made to be consistent with similar statements in other places in the Bases.

5. Changes have been made to more closely reflect the Specification requirements.

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

7. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.3 INSTRUMENTATION

B 3.3.3.1 Post Accident Monitoring (PAM) Instrumentation

, in the control room, [1]

BASES

BACKGROUND

The primary purpose of the PAM instrumentation is to display plant variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for Design Basis Events. The instruments that monitor these variables are designated as Type A, Category I, and non-Type A, Category I in accordance with Regulatory Guide 1.97 (Ref. 1).

The OPERABILITY of the accident monitoring instrumentation ensures that there is sufficient information available on selected plant parameters to monitor and assess plant status and behavior following an accident. This capability is consistent with the recommendations of Reference 1.

APPLICABLE SAFETY ANALYSES

The PAM instrumentation LCO ensures the OPERABILITY of Regulatory Guide 1.97, Type A, variables so that the control room operating staff can:

- Perform the diagnosis specified in the Emergency Operating Procedures (EOP). These variables are restricted to preplanned actions for the primary success path of Design Basis Accidents (DBAs) (e.g., loss of coolant accident (LOCA)); and

- Take the specified, preplanned, manually controlled actions for which no automatic control is provided, which are required for safety systems to accomplish their safety function.

The PAM instrumentation LCO also ensures OPERABILITY of Category I, non-Type A, variables. This ensures the control room operating staff can:

- Determine whether systems important to safety are performing their intended functions;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

- Determine the potential for causing a gross breach of the barriers to radioactivity release;
- Determine whether a gross breach of a barrier has occurred; and
- Initiate action necessary to protect the public and to obtain an estimate of the magnitude of any impending threat.

The plant specific Regulatory Guide 1.97 analysis (Ref. 2) documents the process that identified Type A and Category I, non-Type A, variables.

PAM instrumentation that meets the definition of Type A in Regulatory Guide 1.97 satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii) [1]. Category I, non-Type A, instrumentation is retained in the Technical Specifications (TS) because it is intended to assist operators in minimizing the consequences of accidents. Therefore, these Category I, non-Type A, variables are important for reducing public risk.

LCO

LCO 3.3.3.1 requires two OPERABLE channels for all but one Function to ensure no single failure prevents the operators from being presented with the information necessary to determine the status of the unit and to bring the unit to, and maintain it in, a safe condition following ~~that~~ an [2] accident.

[3] Furthermore, ~~provision of~~ providing [3] two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information. ~~More than two channels may be required at some units if the Regulatory Guide 1.97 analysis determined that failure of one accident monitoring channel results in information ambiguity (e.g., the redundant displays disagree) that could lead operators to defeat or to fail to accomplish a required safety function.~~ [4]

The exception of the two channel requirement is primary containment isolation valve (PCIV) position. In this case, the important information is the status of the primary containment penetrations. The LCO requires one position indicator for each active (e.g., automatic) [3] PCIV. This is sufficient to

(continued)

BASES

LCO (continued)

redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of passive valve or via system boundary status. If a normally active PCIV is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves ~~in this state~~ closed and deactivated [3] [3] is not required to be OPERABLE.

Listed below is a discussion of the specified instrument Functions listed in Table 3.3.3.1-1~~, in the accompanying LCO. These discussions are intended as examples of what should be provided for each Function when the plant specific Bases are prepared~~. [4]

1. Reactor Steam Dome Pressure

Reactor steam dome pressure is a Type A and [1] Category I variable provided to support monitoring of Reactor Coolant System (RCS) integrity and to verify operation of the Emergency Core Cooling Systems (ECCS). Two independent pressure transmitters with a range of 0 psig to 1500 psig monitor pressure. Wide range recorders are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

2. Reactor Vessel Water Level

Reactor vessel water level is a Category I variable provided to support monitoring of core cooling and to verify operation of the ECCS. The wide range and fuel zone range [1] water level channels provide the PAM Reactor Vessel Water Level Function. The ~~wide range water level channels measure from [ ] inches below the dryer skirt~~ [1] range of the recorded/indicated level is from the top of the feedwater control range (just above the high level turbine trip point) down to a point just below the bottom of the active fuel. ~~Wide range~~ Reactor Vessel [1] water level is measured by ~~two~~ six [1] ~~independent differential pressure transmitters. The output from these channels is recorded on two independent pen recorders.~~ (i.e., four wide range channels and two fuel zone range channels). One channel of wide range water level per division and one channel of fuel zone range water level per division are required to be OPERABLE. These channels provide output to recorders and indications. Each division of the required reactor vessel water level channels must include a recorder. [1] These ~~recorders~~ instruments [1] are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

(continued)

The wide range instruments are calibrated at 1000 psig reactor pressure with appropriate temperature compensation and no jet pump flow. The fuel zone instruments are calibrated at saturated conditions at 0 psig with no jet pump flow. 1

BASES

LCO

1 reactor vessel

2. Reactor Vessel Water Level (continued)

The ~~wide range~~ water level instruments are uncompensated for variation in reactor water density and are calibrated to be most accurate at ~~operational~~ a specific vessel 1 pressure and temperature.

3. Suppression Pool Water Level

Type A and 1

Suppression pool water level is a Category I variable provided to detect a breach in the reactor coolant pressure boundary (RCPB). This variable is also used to verify and provide long term surveillance of ECCS function. The wide range suppression pool water level measurement provides the operator with sufficient information to assess the status of the RCPB and to assess the status of the water supply to the ECCS. The wide range water level indicators monitor the ~~suppression pool level from the center line of the ECCS suction lines to the top of the pool.~~ 14 feet above normal level down to the lowest ECCS suction point 1. Two wide range suppression pool water level signals are transmitted from separate ~~differential pressure~~ transmitters and are ~~continuously recorded on two recorders in the control room.~~ 1 displayed on two control room indicators, and separately 1 recorded on two recorders in the control room. These ~~recorders~~ instruments 1 are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

4. Drywell Pressure

Type A and 1

2 a

Drywell pressure is a Category I variable provided to detect breach of the RCPB and to verify ECCS functions that operate to maintain RCS integrity. ~~Two wide range drywell pressure signals are transmitted from separate pressure transmitters and are continuously recorded and displayed on two control room recorders.~~ 1 There are four drywell pressure monitoring channels, two wide range channels and two narrow range channels. The combined range of these instruments is from -5 to 200 psig. The signals from the drywell pressure monitoring channels 1 and the wide range channels are also displayed on indicators. These ~~recorders~~ instruments 1 are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

5. Primary Containment ~~Area~~ Gross Gamma 5 Radiation ~~(High Range)~~

Primary containment ~~area~~ gross gamma 5 radiation ~~(high range)~~ is a Category I variable 1 provided to monitor for the potential of significant radiation releases and to provide release assessment for use by

(continued)

BASES

Gross Gamma 5

LCO

5. Primary Containment ~~Area~~ Radiation ~~(High Range)~~ (continued)

operators in determining the need to invoke site emergency plans.

6 INSERT LCO

[~~For this plant, primary containment area radiation (high range) PAM instrumentation consists of the following:~~]

~~6. Drywell Sump Level~~

~~Drywell sump level is a Category I variable provided for verification of ECCS functions that operate to maintain RCS integrity.~~

~~[For this plant, the drywell sump level PAM instrumentation consists of the following:]~~

~~7. Drywell Drain Sump Level~~

~~Drywell drain sump level is a Category I variable provided to detect breach of the RCPB and for verification and long term surveillance of ECCS functions that operate to maintain RCS integrity.~~

~~[For this plant, the drywell drain sump level PAM instrumentation consists of the following:]~~

5

TSTF-295

Penetration Flow Path 5

5 6 ~~8~~. Primary Containment Isolation Valve (PCIV) Position

a Category I variable

1

~~PCIV~~ position is provided for verification of containment integrity. In the case of PCIV position, the important information is the isolation status of the containment penetration. The LCO requires one channel of valve position indication in the control room to be OPERABLE for each active PCIV (excluding check valves, relief valves, manual valves, CRD solenoid valves, vacuum breakers, and excess flow check valves) in a containment penetration flow path ~~, i.e., two total channels of PCIV position indication for a penetration flow path with two active valves~~. For containment penetrations with only one active PCIV having control room indication, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to verify redundantly the isolation status of each isolable penetration via indicated status of the active

8 requiring post-accident valve position indication (continued)

INSERT LCO

Two redundant radiation detectors are located inside the drywell that have a range of 10^0 R/hr to 10^8 R/hr. These radiation monitors display on recorders located in the control room. Two radiation monitors/recorders are required to be OPERABLE (one per division). Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

BASES

TSTF -295

5

LCO

6 ~~8~~. Penetration Flow Path Primary Containment Isolation Valve (PCIV) Position (continued)

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.

valve, as applicable, and prior knowledge of passive valve or system boundary status. If a penetration is isolated, position indication for the PCIV(s) in the associated penetration flow path is not needed to determine status. Therefore, the position indication for valves in an isolated penetration is not required to be OPERABLE.

~~For this plant, the PCIV position PAM instrumentation consists of the following:~~

INSERT LCO-A

6

~~9. Wide Range Neutron Flux~~

~~Wide range neutron flux is a Category I variable provided to verify reactor shutdown.~~

~~For this plant, wide range neutron flux PAM instrumentation consists of the following:~~

5

5 7 ~~10.~~ 8 ~~11.~~ 5 Drywell ~~and Containment~~ 5 Hydrogen and Oxygen Concentration Analyzer

5 Concentration 5

1

Drywell ~~and containment~~ hydrogen and oxygen concentration analyzers are Category I instruments provided to detect high hydrogen or oxygen concentration conditions that represent a potential for containment breach. Additionally, hydrogen concentration is a Type A variable. This variable is also important in verifying the adequacy of mitigating actions.

~~For this plant, the drywell and containment hydrogen and oxygen analyzers PAM instrumentation consists of the following:~~

INSERT LCO - B

6

~~12. Primary Containment Pressure~~

~~Primary containment pressure is a Category I variable provided to verify RCS and containment integrity and to verify the effectiveness of ECCS actions taken to prevent containment breach. Two wide range primary containment pressure signals are transmitted from separate pressure transmitters and are continuously recorded and displayed on two control room recorders. These recorders are the primary~~

5

(continued)

Insert LCO-A

The indication for each PCIV is provided in the control room. Indicator lights illuminate to indicate PCIV position. Therefore, the PAM Specification deals specifically with this portion of the instrumentation channel.

Insert LCO-B

High hydrogen and oxygen concentrations are each measured by two independent analyzers. Following receipt of a LOCA signal, the analyzers are initiated and continuously record hydrogen and oxygen concentration on two recorders in the control room. The analyzers are designed to operate under accident conditions. The available 0% to 10% range for the hydrogen analyzers and 0% to 20% range for the oxygen analyzers satisfy the intent of Regulatory Guide 1.97. These recorders are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.

BASES

LCO

~~12. Primary Containment Pressure (continued)~~

~~indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channel.~~

5

5 9 ~~13~~. Suppression Pool Water Temperature

Type A and 1

Suppression pool water temperature is a Category I variable provided to detect a condition that could potentially lead to containment breach, and to verify the effectiveness of ECCS actions taken to prevent containment breach. The suppression pool water temperature instrumentation allows operators to detect trends in suppression pool water temperature in sufficient time to take action to prevent steam quenching vibrations in the suppression pool. ~~Twenty-four temperature sensors are arranged in six groups of four independent and redundant channels, located such that there is a group of sensors within a 30 ft line of sight of each relief valve discharge location.~~

~~Thus, six groups of sensors are sufficient to monitor each relief valve discharge location. Each group of four sensors includes two sensors for normal suppression pool temperature monitoring and two sensors for PAM.~~ The output(s) for each channel of ~~the PAM sensors~~ ~~are~~ is recorded on ~~four~~ an independent recorder(s) in the control room. ~~(Channels A and C are redundant to channels B and D, respectively.) All four of these recorders must be OPERABLE to furnish two channels of PAM indication for each of the relief valve discharge locations.~~ These recorders are the primary indication used by the operator during an accident. Therefore, the PAM Specification deals specifically with this portion of the instrument channels.

1

TSTF-295 changes not incorporated

7

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1 and 2. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1 and 2. In MODES 3, 4, and 5, plant conditions are such that the likelihood of an event that would require PAM instrumentation is extremely low; therefore, PAM instrumentation is not required to be OPERABLE in these MODES.

(continued)

1

There are 14 total thermocouple instrument wells in the suppression pool. Each thermocouple well has two thermocouples. Each channel receives input from the thermocouples in 7 wells for a total of 14 thermocouples. A channel is considered OPERABLE if it receives input from at least one OPERABLE thermocouple from each of the 7 wells. The thermocouples are distributed throughout the pool area so as to be able to redundantly detect a stuck open safety/relief valve continuous discharge into the pool.

BASES (continued)

ACTIONS

Note 1 has been added to the ACTIONS to exclude the MODE change restriction of LCO 3.0.4. This exception allows entry into the applicable MODE while relying on the Actions even though the Actions may eventually require plant shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to diagnose an accident using alternate instruments and methods, and the low probability of an event requiring these instruments. 2

A Note has also been provided to modify the ACTIONS related to PAM instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable PAM instrumentation channels provide appropriate compensatory measures for separate inoperable functions. As such, a Note has been provided that allows separate Condition entry for each inoperable PAM Function.

A.1

When one or more Functions have one required channel that is inoperable, the required inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel ~~(or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function)~~ or remaining isolation barrier (in the case of primary containment penetrations with only one PCIV), 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.

1

B.1

If a channel has not been restored to OPERABLE status in 30 days, this Required Action specifies initiation of actions in accordance with Specification 5.6.~~8~~ 6, which

5

(continued)

BASES

ACTIONS

B.1 (continued)

requires a written report to be submitted to the NRC. 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 plant conditions that would require information provided by this instrumentation.

3 Required

3 another OPERABLE channel is monitoring the Function, an alternative method of monitoring is available

C.1

When one or more Functions have two required channels that are inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM 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. ~~Condition C is modified by a Note that excludes hydrogen monitor channels. Condition D provides appropriate Required Actions for two inoperable hydrogen monitor channels.~~ 5

~~D.1~~

~~When two hydrogen monitor channels are inoperable, one hydrogen monitor channel must be restored to OPERABLE status within 72 hours. The 72 hour Completion Time is reasonable, based on the backup capability of the Post Accident Sampling System to monitor the hydrogen concentration for evaluation of core damage and to provide information for operator decisions. Also, it is unlikely that a LOCA that would cause core damage would occur during this time.~~ 5

(continued)

BASES 5

ACTIONS (continued)

D ~~E~~.1

This Required Action directs entry into the appropriate Condition referenced in Table 3.3.3.1-1. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met ~~any~~ the Required Action of Condition C ~~or D, as applicable~~, and the associated Completion Time has expired, Condition ~~E~~ D is entered for that channel and provides for transfer to the appropriate subsequent Condition. 3 5

5 E ~~F~~.1

For the majority of Functions in Table 3.3.3.1-1, if ~~any~~ the Required Action and associated Completion Time of Condition C ~~or D~~ is not met, the plant must be placed in a MODE in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours. 5

3 The allowed Completion Times are reasonable, based on operating experience, to reach the required plant condition from full power conditions in an orderly manner and without challenging plant systems.

5 F ~~G~~.1

Since alternate means of monitoring primary containment ~~area~~ gross gamma radiation have been developed and tested, the Required Action is not to shut down the plant but rather to follow the directions of Specification 5.6.~~8~~ 6. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. 5

As noted at the beginning of the SRs, 3

SURVEILLANCE REQUIREMENTS

~~The~~ the following SRs apply to each PAM instrumentation Function in Table 3.3.3.1-1.

INSERT SR 5

(continued)

Insert SR

The Surveillances are modified by a second Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the other required channel in the associated Function is OPERABLE. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. The 6 hour testing allowance is acceptable since it does not significantly reduce the probability of properly monitoring post-accident parameters, when necessary.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.3.1.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross instrumentation failure has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in ~~one of the channels or of~~ something even more serious. A 3 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 plant instruments located throughout the plant.~~ 1

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including ~~isolation,~~ indication, and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. 3

The Frequency of 31 days is based upon plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any 31 day interval is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of those displays associated with the ~~required~~ channels ~~of this~~ by the LCO. 3

SR 3.3.3.1.2 and SR 3.3.3.1.3

A CHANNEL CALIBRATION is performed every 92 days for Functions 7 and 8 and every ~~18 months, or approximately at every refueling~~ 24 months for all other functions. CHANNEL CALIBRATION is a complete check of the instrument loop including the sensor. The test verifies that the channel responds to the measured parameter with the necessary range and accuracy. The ~~Frequency is~~ 92 day Frequency for CHANNEL CALIBRATION of Functions 7 and 8 is based on operating experience. The 24 month Frequency for CHANNEL CALIBRATION of all other PAM Instrumentation of Table 3.3.3.1-1 is based on operating experience and consistency with the ~~typical industry~~ refueling cycles. 5 3

For Function 6, the CHANNEL CALIBRATION shall consist of verifying that the position indication conforms to the actual valve position. 1

(continued)

BASES (continued)

REFERENCES

1. Regulatory Guide 1.97, "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," ~~(Date)~~. Revision 2, December 1980 [1]

2. ~~[Plant specific documents (e.g., FSAR, NRC Regulatory Guide 1.97, SER letter).]~~ [6]

NRC Safety Evaluation Report, "Commonwealth Edison Company, La Salle County Station, Unit Nos. 1 and 2, Conformance to Regulatory Guide 1.97, dated August 20, 1987.

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, analysis description, or licensing basis description.

2. Typographical/grammatical error corrected.

3. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

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

5. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

6. The brackets have been removed and the proper plant specific information/value has been provided.

7. TSTF-295 revisions associated with Suppression Pool Water Temperature (NUREG-1434, ISTS Table 3.3.3.1-1, Function 13) are not incorporated in the proposed Bases of LaSalle 1 and 2 ITS 3.3.3.1. This difference is consistent with current licensing requirements for the Suppression Pool Water Temperature. All required temperature sensors associated with a channel (irrespective of sensor location) are required to be OPERABLE for the channel to be OPERABLE.

8. A change is made to the Bases to clarify that not every active PCIV must have direct indication of valve position in the control room. For example, Regulatory Guide 1.97 excludes check valves, and the plant design includes active PCIVs for which indication is indirect, such as flow or temperature. Therefore, post-accident valve position indication is not required for every "active" PCIV.

Monitoring 6

B 3.3 INSTRUMENTATION

B 3.3.3.2 Remote Shutdown System

Monitoring 6

BASES

BACKGROUND

The Remote Shutdown System provides the control room operator with sufficient instrumentation and controls to ~~place and~~ maintain the plant in a safe shutdown condition from a location other than the control room. This capability is necessary to protect against the possibility of the control room becoming inaccessible. A safe shutdown condition is defined as MODE 3. With the plant in MODE 3, the Reactor Core Isolation Cooling (RCIC) System, the safety/relief valves, and the Residual Heat Removal Shutdown Cooling System can be used to remove core decay heat and meet all safety requirements. The long term supply of water for the RCIC and the ability to operate shutdown cooling from outside the control room allow extended operation in MODE 3.

Support 6 ing 6 (RHR) 1 1 System 2

In the event that the control room becomes inaccessible, the operators can establish control at the remote shutdown panel and ~~place and~~ maintain the plant 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 plant automatically reaches MODE 3 following a plant shutdown and can be maintained safely in MODE 3 for an extended period of time.

6 monitor the status of the reactor and the suppression pool and the operation of the RHR and RCIC Systems

ing 6 is in 2 6 Support

The OPERABILITY of the Remote Shutdown System control and instrumentation Functions ensures that there is sufficient information available on selected plant parameters to ~~place and~~ maintain the plant in MODE 3 should the control room become inaccessible.

Monitoring 6 6 Support 6 ing 6

APPLICABLE SAFETY ANALYSES

The Remote Shutdown System is required to provide equipment at appropriate locations outside the control room with a design capability to promptly shut down the reactor to MODE 3, including the necessary instrumentation and controls, to maintain the plant in a safe condition in MODE 3.

Monitoring 6 Instrumentation 6 ing 6 Support 6

(continued)

BASES

UFSAR, Section 7.4.4 1

APPLICABLE SAFETY ANALYSES (continued)

The criteria governing the design Monitoring 6 and the specific system requirements of the Remote Shutdown System are located in ~~10 CFR 50, Appendix A, GDC 19~~ (Ref. 1).

The Remote Shutdown Monitoring 6 System is considered an important contributor to reducing the risk of accidents; as such, it meets Criterion 4 of 10 CFR 50.36(c)(2)(ii) ~~has been retained in the Technical Specifications (TS) as indicated in the NRC Policy Statement.~~ 3

LCO

The Remote Shutdown Monitoring 6 System LCO provides the requirements for the OPERABILITY of the instrumentation ~~and controls~~ 6 necessary to support 6 ~~place and~~ maintain ing 6 the plant in MODE 3 from a location other than the control room. The instrumentation Functions 6 ~~and controls~~ ~~typically~~ required are listed in the Technical Requirements Manual (Ref. 2) ~~Table 3.3.3.2-1 in the accompanying LCO~~ ~~plant documents~~. TSTF-266 1

~~Reviewer's Note: For channels that fulfill GDC 19 requirements, the number of OPERABLE channels required depends upon the plant's licensing basis as described in the NRC plant specific Safety Evaluation Report (SER). Generally, two divisions are required to be OPERABLE. However, only one channel per given Function is required if the plant has justified such a design and the NRC SER has accepted the justification.~~ 5

The ~~controls,~~ 6 instrumentation ~~, and transfer switches~~ ~~are~~ ~~those~~ is that 6 required for:

- Reactor pressure vessel (RPV) pressure control;
- Decay heat removal; and
- RPV inventory control ~~; and~~.
- ~~Safety support systems for the above functions, including service water, component cooling water, and onsite power, including the diesel generators.~~ 6

The Remote Shutdown Monitoring 6 System is OPERABLE if all instrument ~~and control~~ 6 monitoring channels needed to support the remote shutdown function ~~s~~ are OPERABLE with readouts displayed in the remote shutdown panel external to the control room 1. ~~In some cases, Table 3.3.3.2-1 may indicate that the required information or control capability is available from several alternate sources. In these cases, the Remote Shutdown System is OPERABLE as long as one~~ 1

(continued)

Monitoring 6

BASES

LCO (continued)

~~channel of any of the alternate information or control sources for each Function is OPERABLE.~~ 6

The Remote Shutdown Monitoring System instruments ~~and control circuits~~ 6 covered by this LCO do not need to be energized to be considered OPERABLE. This LCO is intended to ensure that the instruments ~~and control circuits~~ 6 will be OPERABLE if plant conditions require that the Remote Shutdown Monitoring 6 System be placed in operation.

APPLICABILITY

The Remote Shutdown Monitoring 6 System LCO is applicable in MODES 1 and 2. This is required so that the plant can be ~~placed and~~ 6 maintained in MODE 3 for an extended period of time from a location other than the control room.

This LCO is not applicable in MODES 3, 4, and 5. In these MODES, the plant is already subcritical and in a condition of reduced Reactor Coolant System energy. Under these conditions, considerable time is available to restore necessary instrument ~~control~~ Functions if control room instruments ~~or control~~ become~~s~~ unavailable. Consequently, the ~~TS do~~ LCO does 2 not require OPERABILITY in MODES 3, 4, and 5. 6

ACTIONS

A Note is included that excludes the MODE change restriction of LCO 3.0.4. This exception allows entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a plant shutdown. This exception is acceptable due to the low probability of an event requiring this system.

The 1 A Remote Shutdown Monitoring 6 System ~~division~~ is inoperable when each required 2 function is not accomplished by at least one designated Remote Shutdown Monitoring System channel that satisfies the OPERABILITY criteria for the channel's Function. These criteria are outlined in the LCO section of the Bases. TSTF-266

Note 2 has been provided to modify the ACTIONS related to Remote Shutdown Monitoring 6 System Functions. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable Remote Shutdown Monitoring 6 System Functions provide appropriate compensatory measures for separate Functions.

(continued)

Monitoring 6

BASES

ACTIONS (continued)

As such, a Note has been provided that allows separate Condition entry for each inoperable Remote Shutdown System Function.

Monitoring 6

A.1

Monitoring 6

Condition A addresses the situation where one or more required Functions of the Remote Shutdown System is inoperable. This includes any Function listed in Table 3.3.3.2-1, as well as the control and transfer switches.

required 1 TSTF -266

2 Reference 2 6 6

The Required Action is to restore the Function (both divisions, if applicable) to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

1 1

B.1

If the Required Action and associated Completion Time of Condition A are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

4 INSERT SR

SR 3.3.3.2.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the

(continued)

Insert SR

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. The 6 hour testing allowance is acceptable since it does not significantly reduce the probability of properly monitoring remote shutdown parameters, when necessary.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.2.1 (continued)

instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. As specified in the Surveillance, a CHANNEL CHECK is only required for those channels that are normally energized.

The Frequency is based upon ~~plant~~ operating experience that demonstrates channel failure is rare. 2

~~SR 3.3.3.2.2~~

~~SR 3.3.3.2.2 verifies each required Remote Shutdown System transfer switch and control circuit 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 plant can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. However, this Surveillance is not required to be performed only during a plant outage. Operating experience demonstrates that Remote Shutdown System control channels usually pass the Surveillance when performed at the 18 month Frequency.~~ 4

SR 3.3.3.2.~~3~~ 2 4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies the channel responds to measured parameter values with the necessary range and accuracy. 1

4 24

The ~~18~~ month Frequency is based upon operating experience and engineering judgment and is consistent with the ~~typical industry~~ refueling cycle. 1

(continued)

BASES (continued)

REFERENCES	1. ~~10 CFR 50, Appendix A, GDC 19.~~ UFSAR, Section 7.4.4 [1]
	2. Technical Requirements Manual. [4]

Monitoring [6]

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.3.2 - REMOTE SHUTDOWN MONITORING SYSTEM

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. The proper 10 CFR 50.36(c)(2)(ii) criterion has been used. The current wording was developed prior to the issuance of the change to 10 CFR 50.36, which uses criterion 4 for the current words in the NUREG.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

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

6. The discussions regarding the controls and transfer switches have been deleted. This change has been made to be consistent with the current licensing basis reflected in the Technical Specifications. As a result, the specification was retitled Remote Shutdown Monitoring System.

B 3.3 INSTRUMENTATION

B 3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation

if operating in fast speed 2

BASES

BACKGROUND

The EOC-RPT instrumentation initiates a recirculation pump trip (RPT), to reduce the peak reactor pressure and power resulting from turbine trip or generator load rejection transients to provide additional margin to ~~core thermal~~ the MCPR Safety Limits (SLs). 1 1

The need for the additional negative reactivity in excess of that normally inserted on a scram reflects end of cycle reactivity considerations. Flux shapes at the end of cycle are such that the control rods may not be able to ensure that thermal limits are maintained by inserting sufficient negative reactivity during the first few feet of rod travel upon a scram caused by Turbine Control Valve (TCV)—Fast Closure, Trip Oil Pressure—Low, or Turbine Stop Valve (TSV)—Closure, ~~Trip Oil Pressure—Low (TSV)~~. The physical phenomenon involved is that the void reactivity feedback due to a pressurization transient can add positive reactivity at a faster rate than the control rods can add negative reactivity.

The EOC-RPT instrumentation as shown in Reference 1 is comprised of sensors that detect initiation of closure of the TSVs, or fast closure of the TCVs, combined with relays, logic circuits, and fast acting circuit breakers that interrupt the power from the recirculation pump motor generator (MG) set generators to each of the recirculation pump motors. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the ~~channel output relay~~ actuates, which then outputs an EOC-RPT signal to the trip logic. When the RPT breakers trip open, the recirculation pumps coast down under their own inertia. The EOC-RPT has two identical trip systems, either of which can actuate an RPT.

to actuate reactor recirculation pump downshift logic to trip each pump from fast speed (60 Hz)

to downshift the pumps

instrument switches that actuate at

switch

EOC-

(3A, 3B, 4A and 4B; the fast speed breakers)

2

Each EOC-RPT trip system is a two-out-of-two logic for each Function; thus, either two TSV Closure, ~~Trip Oil Pressure—Low~~ or two TCV Fast Closure, Trip Oil Pressure—Low signals are required for a trip system to actuate. If either trip system actuates, both recirculation pumps, if operating in fast speed, will trip. There are two EOC-RPT breakers in series

, breakers 1A and 1B close to start the LFMG and the low frequency breakers 2A and 2B close automatically on a motor speed interlock to operate the recirculation pumps on low speed (although the recirculation pump start in low speed is not part of the EOC-RPT Instrumentation safety function))

(continued)

BASES

BACKGROUND (continued)

per recirculation pump. One trip system trips one of the two EOC-RPT breakers for each recirculation pump and the second trip system trips the other EOC-RPT breaker for each recirculation pump.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The TSV Closure, Trip Oil ~~Pressure~~—Low and the TCV Fast Closure, Trip Oil Pressure—Low Functions are designed to trip the recirculation pumps, if operating in fast speed in the event of a turbine trip or generator load rejection to mitigate the neutron flux, heat flux and pressurization transients, and to increase the margin to the MCPR SL. The analytical methods and assumptions used in evaluating the turbine trip and generator load rejection, as well as other safety analyses that assume EOC-RPT, are summarized in References 2, 3, and 4. 2 5 2

To mitigate pressurization transient effects, the EOC-RPT must trip the recirculation pumps after initiation of initial closure movement of either the TSVs or the TCVs. The combined effects of this trip and a scram reduce fuel bundle power more rapidly than does a scram alone, resulting in an increased margin to the MCPR SL. Alternatively, MCPR limits for an inoperable EOC-RPT as specified in the COLR are sufficient to mitigate pressurization transient effects. The EOC-RPT function is automatically disabled when THERMAL POWER as sensed by turbine first stage pressure is < ~~40%~~ 25% RTP. 2

EOC-RPT instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). 3 2

The OPERABILITY of the EOC-RPT is dependent on the OPERABILITY of the individual instrumentation channel Functions. Each Function must have a required number of OPERABLE channels in each trip system, with their setpoints within the specified Allowable Value of SR 3.3.4.1.3 2. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Channel OPERABILITY also includes the associated EOC-RPT breakers. Each channel (including the associated EOC-RPT breakers) must also respond within its assumed response time. 4

Allowable Values are specified for each EOC-RPT Function specified in the LCO. Nominal trip setpoints are specified in the setpoint calculations. A channel is inoperable if Move to next page 1

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

INSERT from Previous page

1

its actual trip setpoint is not within its required Allowable Value. The nominal setpoints are selected to ensure the setpoints do not exceed the Allowable Value between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., TSV TCV electrohydraulic control (EHC) pressure), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit switch changes) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

2

Insert ASA

2

The specific Applicable Safety Analysis, LCO, and Applicability discussions are listed below on a Function by Function basis.

Alternately, since this instrumentation protects against a MCPR SL violation with the instrumentation inoperable, modifications to the MCPR limits (LCO 3.2.2) may be applied to allow this LCO to be met. The MCPR penalty limit for the Condition EOC-RPT inoperable is specified in the COLR.

2

Turbine Stop Valve – Closure, ~~Trip Oil Pressure – Low~~

2

Closure of the TSVs and a main turbine trip result in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, an RPT is initiated on TSV – Closure, ~~Trip Oil Pressure – Low~~ in anticipation of the transients that would result from closure of these valves. EOC-RPT decreases reactor power and aids the reactor scram in ensuring the MCPR SL is not exceeded during the worst case transient.

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

All changes are $\boxed{2}$ unless otherwise stated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

Turbine Stop Valve Closure, ~~Trip Oil Pressure—Low~~ (continued)

Closure of the TSVs is determined by ~~measuring~~ monitoring the ~~EHC fluid pressure at~~ position of each stop valve. There is one ~~pressure transmitter~~ valve stem position switch associated with each stop valve, and the signal from each ~~transmitter~~ switch is assigned to a separate trip channel. The logic for the TSV-Closure, ~~Trip Oil Pressure—Low~~ Function is such that two or more TSVs must be closed to produce an EOC-RPT. This Function must be enabled at THERMAL POWER ≥ ~~40%~~ 25% RTP. This is normally accomplished automatically by pressure ~~transmitters~~ switches sensing turbine first stage pressure; therefore, ~~to consider this Function OPERABLE, the turbine bypass valves must remain shut at THERMAL POWER ≥ 40% RTP.~~ opening of the turbine bypass valves may affect this function $\boxed{6}$. Four channels of TSV, Closure, with two channels in each trip system, are available and required to be OPERABLE to ensure that no single instrument failure will preclude an EOC-RPT from this Function on a valid signal. The TSV-Closure, ~~Trip Oil Pressure—Low~~ Allowable Value is selected ~~high enough~~ to detect imminent TSV closure.

This protection is required, consistent with the safety analysis assumptions, whenever THERMAL POWER is ≥ ~~40%~~ 25% RTP $\boxed{4}$ with any recirculating pump in fast speed. Below ~~40%~~ RTP or with the recirculation in slow speed, the Reactor Vessel Steam Dome Pressure—High and the Average Power Range Monitor (APRM) Fixed Neutron Flux—High Functions of the Reactor Protection System (RPS) are adequate to maintain the necessary safety margins.

~~The automatic enable setpoint is feedwater temperature dependent as a result of the subcooling changes that affect the turbine first stage pressure/reactor power relationship. For operation with feedwater temperature ≥ 420°F, an Allowable Value setpoint of ≤ 26.9% of control valves wide open turbine first stage pressure is provided for the bypass function. The Allowable Value setpoint is reduced to ≤ 22.5% of control valve wide open turbine first stage pressure for operation with a feedwater temperature between 370°F and 420°F.~~

(continued)

all changes are $\boxed{2}$ unless otherwise stated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

TCV Fast Closure, Trip Oil Pressure—Low

Fast closure of the TCVs during a generator load rejection results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. Therefore, an RPT is initiated on TCV Fast Closure, Trip Oil Pressure—Low in anticipation of the transients that would result from the closure of these valves. The EOC-RPT decreases reactor power and aids the reactor scram in ensuring that the MCPR SL is not exceeded during the worst case transient.

Fast closure of the TCVs is determined by measuring the EHC fluid pressure at each control valve. There is one pressure ~~transmitter~~ Switch associated with each control valve, and the signal from each ~~transmitter~~ is assigned to a separate trip channel. The logic for the TCV Fast Closure, Trip Oil Pressure—Low Function is such that two or more TCVs must be closed (pressure ~~transmitter~~ trips) to produce an EOC-RPT. This Function must be enabled at THERMAL POWER ≥ ~~40%~~ 25 RTP. $\boxed{4}$ This is normally accomplished automatically by pressure ~~transmitters~~ switches sensing turbine first stage pressure; ~~therefore, to consider this Function OPERABLE, the turbine bypass valves must remain shut at THERMAL POWER ≥ 40% RTP.~~ opening of the turbine bypass valves may affect this function. $\boxed{6}$ Four channels of TCV Fast Closure, Trip Oil Pressure—Low, with two channels in each trip system, are available and required to be OPERABLE to ensure that no single instrument failure will preclude an EOC-RPT from this Function on a valid signal. The TCV Fast Closure, Trip Oil Pressure—Low Allowable Value is selected high enough to detect imminent TCV fast closure.

25 $\boxed{4}$ 25

This protection is required consistent with the analysis, whenever the THERMAL POWER is ≥ ~~40%~~ RTP with any recirculating pump in fast speed. Below ~~40%~~ RTP or with recirculation pumps in slow speed, the Reactor Vessel Steam Dome Pressure—High and the APRM Fixed Neutron Flux—High Functions of the RPS are adequate to maintain the necessary safety margins. The turbine first stage pressure/reactor power relationship for the setpoint of the automatic enable is identical to that described for TSV closure.

ACTIONS

~~[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use~~ $\boxed{7}$

(continued)

BASES

ACTIONS (continued)

~~the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.~~ 7

A Note has been provided to modify the ACTIONS related to EOC-RPT instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable EOC-RPT instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable EOC-RPT instrumentation channel.

A.1 and A.2

required TSTF-227

With one or more channels inoperable, but with EOC-RPT trip capability maintained (refer to Required Action B.1 and B.2 Bases), the EOC-RPT System is capable of performing the intended function. However, the reliability and redundancy of the EOC-RPT instrumentation is reduced such that a single failure in the remaining trip system could result in the inability of the EOC-RPT System to perform the intended function. Therefore, only a limited time is allowed to restore compliance with the LCO. Because of the diversity of sensors available to provide trip signals, the low probability of extensive numbers of inoperabilities affecting all diverse Functions, and the low probability of an event requiring the initiation of an EOC-RPT, 72 hours is allowed to restore the inoperable channels (Required Action A.1) ~~or apply the EOC-RPT inoperable MCPR limit~~. 3 Alternately, the inoperable channels may be placed in trip (Required Action A.2) since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. As noted in Required Action A.2, placing the channel in trip with no further restrictions is not allowed if the inoperable channel is the result of an inoperable breaker, since this may not adequately compensate for the

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

inoperable breaker (e.g., the breaker may be inoperable such that it will not open). If it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an RPT), or if the inoperable channel is the result of an inoperable breaker, Condition C must be entered and its Required Actions taken.

B.1 and B.2

Required Actions B.1 and B.2 are intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in the Function not maintaining EOC-RPT trip capability. A Function is considered to be maintaining EOC-RPT trip capability when sufficient channels are OPERABLE or in trip, such that the EOC-RPT System will generate a trip signal from the given Function on a valid signal and both recirculation pumps can be tripped. This requires two channels of the Function, in the same trip system, to each be OPERABLE or in trip, and the associated EOC-RPT breakers to be OPERABLE or in trip. Alternatively, Required Action B.2 requires the MCPR limit for inoperable EOC-RPT, as specified in the COLR, to be applied. This also restores the margin to MCPR assumed in the safety analysis.

2 , if operating in fast speed,

The 2 hour Completion Time is sufficient for the operator to take corrective action, and takes into account the likelihood of an event requiring actuation of the EOC-RPT instrumentation during this period. It is also consistent with the 2 hour Completion Time provided in LCO 3.2.2, Required Action A.1, since this instrumentation's purpose is to preclude a MCPR violation.

C.1 and C.2

25 4

With any Required Action and associated Completion Time not met, THERMAL POWER must be reduced to < ~~40~~% RTP within 4 hours. Alternately, the associated recirculation pump may be removed from service since this performs the intended function of the instrumentation. The allowed Completion Time of 4 hours is reasonable, based on operating

fast speed breaker 8

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

25 — 4

experience, to reduce THERMAL POWER to < 40% RTP from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~ — 7

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains EOC-RPT trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 5) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.1.1

1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on reliability analysis (Ref. 5).

~~SR 3.3.4.1.2~~

~~The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the setting is discovered to be less conservative than the~~ — 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.2 (continued)

~~Allowable Value specified in SR 3.3.4.1.3. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~

~~The Frequency of 92 days is based on assumptions of the reliability analysis (Ref. 5) and on the methodology included in the determination of the trip setpoint.~~

4

SR 3.3.4.1 ~~3~~ 2 4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of ~~an~~ ~~18~~ 24 month calibration interval, in the determination of the magnitude of equipment drift in the setpoint analysis. 4

SR 3.3.4.1 ~~4~~ 3 4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers is included as a part of this test, overlapping the LOGIC SYSTEM FUNCTIONAL TEST, to provide complete testing of the associated safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel would also be inoperable.

4 24 The ~~18~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

(continued)

all changes are 2 unless otherwise stated

BASES 4

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.~~4~~ 3 (continued)

Operating experience has shown these components usually pass the Surveillance test when performed at the ~~18~~ 24 4 month Frequency.

SR 3.3.4.1.~~5~~ 4 4

This SR ensures that an EOC-RPT initiated from the TSV – Closure, ~~Trip Oil Pressure—Low~~ and TCV ~~Fast~~ Closure, Trip Oil Pressure—Low Functions will not be inadvertently bypassed when THERMAL POWER is ≥ ~~40%~~ 25 4 RTP. This involves calibration of the bypass channels. Adequate margins for the instrument setpoint methodologies are incorporated into the actual setpoint. Because main turbine bypass flow can affect this setpoint nonconservatively (THERMAL POWER is derived from first stage pressure), the main turbine bypass valves must remain closed during an in-service calibration 16 at THERMAL POWER ≥ ~~40%~~ 25 4 RTP if performing the calibration using actual turbine first stage pressure, 4 to ensure that the calibration remains valid. If any bypass channel's setpoint is nonconservative (i.e., the Functions are bypassed at ≥ ~~40%~~ 25 4 RTP either due to open main turbine bypass valves or other reasons), the affected TSV – Closure, ~~Trip Oil Pressure—Low~~ and TCV ~~Fast~~ Closure, Trip Oil Pressure—Low Functions are considered inoperable. Alternatively, the bypass channel can be placed in the conservative condition (nonbypass). If placed in the nonbypass condition, this SR is met and the channel considered OPERABLE.

The Frequency of ~~18~~ 24 4 months ~~has shown that channel bypass failures between successive tests are rare~~ is based on engineering judgment and reliability of the components.

SR 3.3.4.1.~~6~~ 5 4

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. The EOC-RPT SYSTEM RESPONSE TIME acceptance criteria are included in Reference 6.

~~A~~ Note ~~1~~ to the Surveillance states that breaker ~~interruption~~ arc suppression time may be assumed from the most recent performance of SR 3.3.4.1.~~7~~ 6. This is allowed since the ~~time to open the contacts after energization of the trip coil and the~~ arc suppression time ~~are~~ is short and ~~do~~ does not appreciably change, 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1.~~6~~ 5 (continued) 4

due to the design of the breaker opening device and the fact that the breaker is not routinely cycled. INSERT 1 4

2 INSERT 2

EOC-RPT SYSTEM RESPONSE TIME tests are conducted on an ~~18~~ 24 month STAGGERED TEST BASIS. Response times cannot be determined at power because operation of final actuated devices is required. Therefore, the ~~18~~ 24 month Frequency is consistent with the ~~typical industry~~ refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components that cause serious response time degradation, but not channel failure, are infrequent occurrences. 4 4 1

SR 3.3.4.1.~~7~~ 6 4

This SR ensures that the EOC- RPT breaker ~~interruption~~ arc suppression time ~~(arc suppression time plus time to open the contacts)~~ is provided to the EOC-RPT SYSTEM RESPONSE TIME test. The 60 month Frequency of the testing is based on the difficulty of performing the test and the reliability of the circuit breakers. 1 4

REFERENCES

1. FSAR, Figure ~~7.3~~ G.3.3-2 ~~(EOC-RPT instrumentation logic)~~. 3
2. FSAR, Sections ~~15.2.2~~ 7.6.4, G.3.3.3.8.2, and G.5.1
3. FSAR, Sections ~~[15.1.1], [15.1.2], and [15.1.3]~~ 15.1.2A, 15.2.2A, 15.2.3, and 15.2.3A
4. FSAR, Sections ~~[5.5.16.1] and [7.6.10]~~ 7.6.4.2.1 3
5. GENE-770-06-~~2~~ 1-A, "Bases for Changes To Surveillance Test Intervals And Allowed Out-Of-Service Times For Selected Instrumentation Technical Specifications," ~~February 1991~~ December 1992.
6. FSAR, Sections ~~5.5.16.2~~ G.3.3.3.8.1, G.3.3.3.8.2, G.5.1.3.1, and G.5.1.6.1

2 4 4

Insert 1

Note 2 states that the response time of the limit switches for TSV – Closure Function of EOC-RPT may be conservatively assumed and therefore, are excluded from the EOC-RPT SYSTEM RESPONSE TIME testing. This is allowed since the actual measurement of the limit switch response time is not practicable as this test is done during the refueling outage when the turbine stop valves are fully closed, and thus the limit switch in the circuitry is open. The response time of the limit switch is conservatively assumed to be 10 ms.

Insert 2

The STAGGERED TEST BASIS is conducted on a function basis such that each test includes at least the logic of one type of channel input, i.e., TCV – Fast Closure, Trip Oil Pressure – Low, or TSV – Closure, such that both types of channel inputs are tested at least once per 48 months.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.4.1 - EOC-RPT INSTRUMENTATION

1. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

5. Typographical/grammatical error corrected.

6. The words have been modified to state that opening the bypass valves may affect this Function. If the bypass valves are open above 25% RTP, but the Function is still enforcing the EOC-RPT (i.e., it is not bypassed), there is no reason to declare the Function inoperable. If the Function is bypassed above 25% RTP due to an open bypass valve, then the Function would be inoperable. The proposed words state that an open bypass valve could affect this Function. The words in the Bases for ITS SR 3.3.4.1.4 (ISTS SR 3.3.4.1.5) have been modified to state that the bypass valves must remain closed during the calibration. At other times, the bypass valves can be open (and the bypass valves are periodically opened to perform SRs) as long as the Function is not inadvertently bypassed.

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

8. Changes have been made to more closely reflect the Specification requirements.

B 3.3 INSTRUMENTATION

B 3.3.4.2 Anticipated Transient Without Scram Recirculation Pump Trip (ATWS-RPT) Instrumentation

BASES

BACKGROUND

1 The ATWS-RPT System initiates a recirculation pump trip, adding negative reactivity, following events in which a scram does not (but should) occur, to lessen the effects of an ATWS event. Tripping the recirculation pumps adds negative reactivity from the increase in steam voiding in the core area as core flow decreases. When Reactor Vessel Water Level—Low Low, Level 2 or Reactor Steam Dome Pressure—High setpoint is reached, the recirculation pump motor breakers trip.

The ATWS-RPT System (Ref. 1) includes sensors, relays, bypass capability, circuit breakers, and switches that are necessary to cause initiation of a recirculation pump trip. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs an ATWS-RPT signal to the trip logic.

The ATWS-RPT consists of two independent trip systems, with two channels of Reactor Steam Dome Pressure—High and two channels of Reactor Vessel Water Level—Low Low, Level 2, in each trip system. Each ATWS-RPT trip system is a two-out-of-two logic for each Function. Thus, either two Reactor Water Level—Low Low, Level 2 or two Reactor Pressure—High signals ~~are needed to~~ will trip a trip system. 1 The outputs of the channels in a trip system are combined in a logic so that either trip system will trip both recirculation pumps (by tripping the respective fast speed and low frequency motor generator (LFMG) motor breakers).

There ~~is one~~ are two fast speed motor breakers and one LFMG output breaker provided for each of the two recirculation pumps for a total of ~~four~~ six motor breakers. The output of each trip system is provided to ~~all four breakers~~ one fast speed motor breaker (3A, 3B) and the LFMG output breaker (2A, 2B) for each pump. 2

(continued)

BASES (continued) to mitigate any accident or transient 2

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The ATWS-RPT ~~is~~ not assumed in the safety analysis. The ATWS-RPT initiates an RPT to aid in preserving the integrity of the fuel cladding following events in which scram does not, but should, occur. Based on its contribution to the reduction of overall plant risk, however, the instrumentation ~~is included as required by the NRC Policy Statement~~ meets Criterion 4 of 10 CFR 50.36(c)(2)(ii) 3

The OPERABILITY of the ATWS-RPT is dependent on the OPERABILITY of the individual instrumentation channel Functions. Each Function must have a required number of OPERABLE channels in each trip system, with their setpoints within the specified Allowable Value of SR 3.3.4.2.~~4~~ 3 4. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Channel OPERABILITY also includes the associated recirculation pump ~~drive motor~~ fast speed and LFMG 2 breakers. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. 1

Allowable Values are specified for each ATWS-RPT Function specified in the LCO. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the ~~safety~~ ATWS 2 analysis. ~~The Allowable Values are derived from the analytic limits corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~ INSERT ASA 2

The individual Functions are required to be OPERABLE in MODE 1 to protect against common mode failures of the

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Reactor Protection System by providing a diverse trip to mitigate the consequences of a postulated ATWS event. The Reactor Steam Dome Pressure—High and Reactor Vessel Water Level—Low Low, Level 2 Functions are required to be OPERABLE in MODE 1, since the reactor is producing significant power and the recirculation system could be at high flow. During this MODE, the potential exists for pressure increases or low water level, assuming an ATWS event. In MODE 2, the reactor is at low power and the recirculation system is at low flow; thus, the potential is low for a pressure increase or low water level, assuming an ATWS event. Therefore, the ATWS-RPT is not necessary. In MODES 3 and 4, the reactor is shut down with all control rods inserted; thus, an ATWS event is not significant and the possibility of a significant pressure increase or low water level is negligible. In MODE 5, the one-rod-out interlock ensures the reactor remains subcritical; thus, an ATWS event is not significant. In addition, the reactor pressure vessel (RPV) head is not fully tensioned and no pressure transient threat to the reactor coolant pressure boundary (RCPB) exists.

The specific Applicable Safety Analyses and LCO discussions are listed below on a Function by Function basis.

a. Reactor Vessel Water Level—Low Low, Level 2

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the ATWS-RPT System is initiated at Level 2 to aid in maintaining level above the top of the active fuel. The reduction of core flow reduces the neutron flux and THERMAL POWER and, therefore, the rate of coolant boiloff.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

Four channels of Reactor Vessel Level—Low Low, Level 2, with two channels in each trip system, are available and required to be OPERABLE to ensure that no single instrument failure can preclude an ATWS-RPT from this Function on a

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Reactor Vessel Water Level—Low Low, Level 2 (continued)

valid signal. The Reactor Vessel Water Level—Low Low, Level 2, Allowable Value is chosen so that the system will not initiate after a Level 3 scram with feedwater still available~~, and for convenience with the reactor core isolation cooling (RCIC) initiation~~.

2

b. Reactor Steam Dome Pressure—High

Excessively high RPV pressure may rupture the RCPB. An increase in the RPV pressure during reactor operation compresses the steam voids and results in a positive reactivity insertion. This increases neutron flux and THERMAL POWER, which could potentially result in fuel failure and RPV overpressurization. The Reactor Steam Dome Pressure—High Function initiates an RPT for transients that result in a pressure increase, counteracting the pressure increase by rapidly reducing core power generation. For the overpressurization event, the RPT aids in the ~~termination~~ mitigation of the ATWS event and, along with the safety/relief valves (S/RVs), limits the peak RPV pressure to less than the ASME Section III Code Service Level C limits (1500 psig). 2

The Reactor Steam Dome Pressure—High signals are initiated from four pressure transmitters that monitor reactor steam dome pressure. Four channels of Reactor Steam Dome Pressure—High, with two channels in each trip system, are available and required to be OPERABLE to ensure that no single instrument failure can preclude an ATWS-RPT from this Function on a valid signal. The Reactor Steam Dome Pressure—High Allowable Value is chosen to provide an adequate margin to the ASME Section III Code Service Level C allowable Reactor Coolant System pressure.

ACTIONS

A Note has been provided to modify the ACTIONS related to ATWS-RPT instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required

(continued)

BASES

ACTIONS (continued)

Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable ATWS-RPT instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable ATWS-RPT instrumentation channel.

A.1 and A.2

trip 1

With one or more channels inoperable, but with ATWS-RPT capability for each Function maintained (refer to Required Action B.1 and C.1 Bases), the ATWS-RPT System is capable of performing the intended function. However, the reliability and redundancy of the ATWS-RPT instrumentation is reduced, such that a single failure in the remaining trip system could result in the inability of the ATWS-RPT System to perform the intended function. Therefore, only a limited time is allowed to restore the inoperable channels to OPERABLE status. Because of the diversity of sensors available to provide trip signals, the low probability of extensive numbers of inoperabilities affecting all diverse Functions, and the low probability of an event requiring the initiation of ATWS-RPT, 14 days is provided to restore the inoperable channel (Required Action A.1). Alternately, the inoperable channel may be placed in trip (Required Action A.2), since this would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. As noted, placing the channel in trip with no further restrictions is not allowed if the inoperable channel is the result of an inoperable breaker, since this may not adequately compensate for the inoperable breaker (e.g., the breaker may be inoperable such that it will not open). If it is not desirable to place the channel in trip (e.g., as in the case where placing the inoperable channel would result in an RPT), or if the inoperable channel is the result of an inoperable breaker, Condition D must be entered and its Required Actions taken.

in trip 1

(continued)

BASES

ACTIONS (continued)

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in the Function not maintaining ATWS-RPT trip capability. A Function is considered to be maintaining ATWS-RPT trip capability when sufficient channels are OPERABLE or in trip such that the ATWS-RPT System will generate a trip signal from the given Function on a valid signal, and both recirculation pumps can be tripped. This requires two channels of the Function in the same trip system associated with ATWS-RPT to each be OPERABLE or in trip, and the corresponding ~~four~~ motor breakers (~~two~~ one fast speed and ~~two~~ one LFMG per pump) to be OPERABLE or in trip. 2

The 72 hour Completion Time is sufficient for the operator to take corrective action (e.g., restoration or tripping of channels) and takes into account the likelihood of an event requiring actuation of the ATWS-RPT instrumentation during this period and the fact that one Function is still maintaining ATWS-RPT trip capability.

C.1

Required Action C.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within both Functions result in both Functions not maintaining ATWS-RPT trip capability. The description of a Function maintaining ATWS-RPT trip capability is discussed in the Bases for Required Action B.1, above.

The 1 hour Completion Time is sufficient for the operator to take corrective action and takes into account the likelihood of an event requiring actuation of the ATWS-RPT instrumentation during this period.

D.1 and D.2

With any Required Action and associated Completion Time not met, the plant must be brought to a MODE or other specified condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 2 within 6 hours (Required Action D.2). Alternately, the associated recirculation pump may be removed from service since this

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

performs the intended Function of the instrumentation (Required Action D.1). The allowed Completion Time of 6 hours is reasonable, based on operating experience, both to reach MODE 2 from full power conditions and to remove a recirculation pump from service in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

~~[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]~~ 5

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ATWS-RPT trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 2) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the recirculation pumps will trip when necessary.

SR 3.3.4.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.4.2.1 (continued)

instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon 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 required channels of this LCO.

SR 3.3.4.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. 1

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 2.

~~SR 3.3.4.2.3~~

~~Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.4.2.4. If the trip setting is discovered to be less conservative than the setting accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~ 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS

~~SR 3.3.4.2.3 (continued)~~

~~The Frequency of 92 days is based on the reliability analysis of Reference 2.~~ 4

SR 3.3.4.2.~~4~~ 3 4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an ~~18~~ 24 4 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.4.2.~~5~~ 4 4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required trip logic for a specific channel. The system functional test of the pump breakers, included as part of this Surveillance, overlaps the LOGIC SYSTEM FUNCTIONAL TEST to provide complete testing of the assumed safety function. Therefore, if a breaker is incapable of operating, the associated instrument channel(s) would be inoperable.

4 24 The ~~18~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the ~~18~~ month Frequency.

24 4

(continued)

BASES (continued)

REFERENCES u 1. FSAR, Figure [ ] -A Appendix G.3.1.2.

2. GENE NEDE-770-06-1, "Bases For Changes To Surveillance Test Intervals and Allowed Out-of-Service Times For Selected Instrumentation Technical Specifications," February 1991. December 1992

2

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.4.2 - ATWS-RPT INSTRUMENTATION

1. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

3. The proper 10 CFR 50.36(c)(2)(ii) criterion has been used. The current wording was developed prior to the issuance of the change to 10 CFR 50.36, which uses criterion 4 for the current words in the NUREG.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

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

All changes are [2] unless otherwise indicated

B 3.3 INSTRUMENTATION

B 3.3.5.1 Emergency Core Cooling System (ECCS) Instrumentation

BASES

BACKGROUND

The purpose of the ECCS instrumentation is to initiate appropriate responses from the systems to ensure that fuel is adequately cooled in the event of a design basis accident or transient.

For most anticipated operational occurrences (AOOs) and Design Basis Accidents (DBAs), a wide range of dependent and independent parameters are monitored.

The ECCS instrumentation actuates low pressure core spray (LPCS), low pressure coolant injection (LPCI), high pressure core spray (HPCS), Automatic Depressurization System (ADS), and the diesel generators (DGs). The equipment involved with each of these systems is described in the Bases for LCO 3.5.1, "ECCS—Operating," or LCO 3.8.1, "AC Sources - Operating." [1]

<u>Low Pressure Core Spray System</u>

differential pressure

Reactor Vessel Water Level

Drywell pressure is monitored by two pressure switches.

The LPCS System may be initiated by either automatic or manual means. Automatic initiation occurs for conditions of Reactor Vessel Water Level—Low Low Low, Level 1 or Drywell Pressure—High. ~~Each of these diverse variables~~ Reactor Vessel Water Level is monitored by two redundant differential pressure transmitters, ~~which are, in turn, connected to two~~ each providing input to a trip unit. The outputs of the four ~~trip units (two trip units from each of the two variables)~~ signals (two trip units and two pressure switches) are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic. The logic will provide an initiation signal if both reactor vessel water level channels or both drywell pressure channels trip. In addition, the logic will provide an initiation signal if a certain combination of reactor vessel water level and drywell pressure channels trip. The ~~high drywell pressure~~ LPCS initiation signal is a sealed in signal and must be manually reset. The LPCS initiation signal also provides an initiation signal to the Division 1 LPCI initiation logic. The logic can also be initiated by use of a manual push button. Upon receipt of an initiation signal, the LPCS pump is automatically started if normal AC power is available; otherwise the pump is started immediately after [2] power is available from the DG.

The LPCS test line isolation valve, which is also a primary containment isolation valve (PCIV), is closed on a LPCS initiation signal to allow full system flow assumed in the accident analysis and maintains containment isolation in the event LPCS is not operating.

The LPCS pump discharge flow is monitored by a flow ~~transmitter~~ switch that senses the differential pressure across a flow element in the pump discharge line. When the pump is running and discharge flow is

(continued)

All changes are 2 unless otherwise indicated

BASES

BACKGROUND

Low Pressure Core Spray System (continued)

low enough that pump overheating may occur, the minimum flow return line valve is opened. The valve is automatically closed if flow is above the minimum flow setpoint to allow the full system flow assumed in the accident analysis.

within the injection line and

The LPCS System also monitors the pressure in the reactor vessel to ensure that, before the injection valve opens, the reactor pressure has fallen to a value below the LPCS System's maximum design pressure. The ~~variable~~ is monitored by four redundant ~~transmitters, which are, in turn, connected to trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic.~~

injection line pressure and

pressure in the LPCS injection line

one pressure switch while reactor pressure is monitored by two pressure switches. The injection valve will receive an open permissive signal if the LPCS injection line pressure switch senses low pressure (one-out-of-one logic) and if any one of the reactor pressure switches sense low pressure (one-out-of-two logic).

The reactor vessel pressure switches also provide a permissive signal to the Division 1 LPCI injection valve

Low Pressure Coolant Injection Subsystems

The LPCI is an operating mode of the Residual Heat Removal (RHR) System, with three LPCI subsystems. The LPCI subsystems may be initiated by automatic or manual means. Automatic initiation occurs for conditions of Reactor Vessel Water Level—Low Low Low, Level 1 or Drywell Pressure—High. ~~Each of these diverse variables~~ is monitored by two redundant transmitters per Division, ~~which are, in turn, connected to two~~ trip units. The outputs of the four Division 2 LPCI (loops B and C) ~~trip units (two trip units from each of the two variables)~~ are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic. The Division 1 LPCI (loop A) receives its initiation signal from the LPCS logic, which uses a similar one-out-of-two taken twice logic. The two Divisions can also be initiated by use of a manual push button (one per Division). Once an initiation signal is received by the LPCI control circuitry, the signal is sealed in until manually reset.

Reactor Vessel water level

differential pressure

Drywell pressure is monitored by two pressure switches, per division.

each providing input to a

signals (two trip units and two pressure switches)

Insert LPCI-1

, with the LPCI A manual push button being common with LPCS

Upon receipt of an initiation signal, the LPCI Pump C is started immediately after power is available ~~while LPCI~~ A and ~~LPCI~~ B ~~pumps~~ are started ~~after a 5 second delay, to~~ limit the loading on the standby power sources.

is automatically started if normal AC power is available; otherwise the pump

from the DG

in approximately 5 seconds after AC power from the DG is available. These time delays

are automatically started if offsite power is available; otherwise the pumps

Each LPCI subsystem's discharge flow is monitored by a flow ~~transmitter~~. When a pump is running and discharge flow is low enough that pump overheating may occur, the respective

switch that senses the differential pressure across a flow element in the pump discharge line

(continued)

Insert LPCI-1

The logic will provide an initiation signal if both reactor vessel water level channels or both drywell pressure channels trip. In addition, the logic will provide an initiation signal if certain combinations of reactor vessel water level and drywell pressure channels trip.

All changes are $\boxed{2}$ unless otherwise indicated

BASES

BACKGROUND

Low Pressure Coolant Injection Subsystems (continued)

minimum flow return line valve is opened. The valve is automatically closed if flow is above the minimum flow setpoint to allow the full system flow assumed in the analyses.

The RHR test line suppression pool cooling isolation and suppression pool spray isolation valves (which are also PCIVs) are closed on a LPCI initiation signal to allow full system flow assumed in the accident analysis and maintain containment isolated in the event LPCI is not operating.

within the associated injection line and

injection line pressure and

The LPCI subsystems monitor the pressure in the reactor vessel to ensure that, prior to an injection valve opening, the reactor pressure ~~has~~ have fallen to a value below the LPCI subsystem's maximum design pressure. The ~~variable~~ is monitored by four redundant transmitters per Division, which are, in turn, connected to four trip units. The outputs of the four Division 2 LPCI (loops B and C) trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic. The Division 1 LPCI (loop A) receives its signals from the LPCS logic, ~~which uses a similar one-out-of-two taken twice logic~~.

pressure within each LPCI injection line

Insert LPCI-2

Each pressure switch provides input to a relay whose contact is arranged in a one-out-of two taken twice logic.

reactor pressure

High Pressure Core Spray System

The HPCS System may be initiated by either automatic or manual means. Automatic initiation occurs for conditions of Reactor Vessel Water Level—Low Low, Level 2 or Drywell Pressure—High. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic ~~for each variable~~. The HPCS System initiation signal is a sealed in signal and must be manually reset.

Reactor vessel water level is monitored by four redundant differential pressure transmitters and drywell pressure is monitored by four redundant pressure switches. Each differential pressure transmitter provides input to a trip unit.

(as indicated by the pressure switch)

The logic can also be initiated by use of a manual pushbutton

and pressure are

The HPCS pump discharge flow ~~is~~ monitored by a ~~flow transmitter~~. When the pump is running and discharge flow is low enough that pump overheating may occur, the minimum flow return line valve is opened. The valve is automatically closed if flow is above the minimum flow setpoint to allow full system flow assumed in the accident analyses.

differential pressure switch and a pressure switch, respectively

full flow

to the suppression pool

The HPCS test line isolation valve (which is also a PCIV) is closed on a HPCS initiation signal to allow full system flow

(continued)

one pressure switch, while reactor pressure is monitored by two pressure switches, per division. The associated injection valve will receive an open permissive signal if the LPCI injection line pressure switch senses low pressure (one-out-of-one logic) and if any one of the associated reactor pressure switches sense low pressure (one-out-of-two logic, per division).

All changes are $\boxed{2}$ unless otherwise indicated

BASES

BACKGROUND

High Pressure Core Spray System (continued)

assumed in the accident analyses and maintain containment isolated in the event HPCS is not operating.

~~The HPCS System also monitors the water levels in the condensate storage tank (CST) and the suppression pool, since these are the two sources of water for HPCS operation. Reactor grade water in the CST is the normal and preferred source. Upon receipt of a HPCS initiation signal, the CST suction valve is automatically signaled to open (it is normally in the open position), unless the suppression pool suction valve is open. If the water level in the CST falls below a preselected level, first the suppression pool suction valve automatically opens, and then the CST suction valve automatically closes. Two level transmitters are used to detect low water level in the CST. Either transmitter and associated trip unit can cause the suppression pool suction valve to open and the CST suction valve to close. The suppression pool suction valve also automatically opens and the CST suction valve closes if high water level is detected in the suppression pool. To prevent losing suction to the pump, the suction valves are interlocked so that one suction path must be open before the other automatically closes.~~

The HPCS System provides makeup water to the reactor until the reactor vessel water level reaches the high water level (Level 8) trip, at which time the HPCS injection valve closes. The HPCS pump will continue to run on minimum flow. The logic is two-out-of-two to provide high reliability of the HPCS System. The injection valve automatically reopens if a low low water level signal is subsequently received.

Automatic Depressurization System

Drywell Pressure

ADS may be initiated by either automatic or manual means. Automatic initiation occurs when signals indicating Reactor Vessel Water Level—Low Low Low, Level 1; ~~Drywell Pressure—High or ADS~~ Bypass Timer; confirmed Reactor Vessel Water Level—Low, Level 3; and either LPCS or LPCI Pump Discharge Pressure—High are all present, and the ADS Initiation Timer has timed out. There are two differential pressure transmitters ~~each~~ for Reactor Vessel Water Level—Low Low Low, Level 1 (1) ~~and~~ two pressure switches for Drywell Pressure—High, and one transmitter for confirmed

(continued)

All changes are $\boxed{2}$ unless otherwise indicated

BASES

BACKGROUND

Automatic Depressurization System (continued)

Reactor Vessel Water Level—Low, Level 3 in each of the two ADS trip systems. Each of these transmitters connects to a trip unit, which then drives a relay whose contacts ~~form~~ input to the initiation logic.

Each pressure switch drives a relay whose contacts also inputs to the initiation logic.

Each ADS trip system (trip system A and trip system B) includes a time delay between satisfying the initiation logic and the actuation of the ADS valves. The time delay chosen is long enough that the HPCS has time to operate to recover to a level above Level 1, yet not so long that the LPCI and LPCS systems are unable to adequately cool the fuel if the HPCS fails to maintain level. An alarm in the control room is annunciated when either of the timers is running. Resetting the ADS initiation signals resets the ADS Initiation Timers.

The ADS also monitors the discharge pressures of the three LPCI pumps and the LPCS pump. Each ADS trip system includes two discharge pressure permissive transmitters switches from each of the two low pressure ECCS pumps in the associated Division (i.e., Division 1 ECCS inputs to ADS trip system A and Division 2 ECCS inputs to ADS trip system B). The signals are used as a permissive for ADS actuation, indicating that there is a source of core coolant available once the ADS has depressurized the vessel. Any one of the four low pressure pumps provides sufficient core coolant flow to permit automatic depressurization.

The ADS logic in each trip system is arranged in two strings. One string has a contact from each of the following variables: Reactor Vessel Water Level—Low Low Low, Level 1; Drywell Pressure—High or ADS Drywell Pressure Bypass Timer; Reactor Vessel Water Level—Low, Level 3; ADS Initiation Timer; and two low pressure ECCS Discharge Pressure—High contacts (one from each divisional pump). The other string has a contact from each of the following variables: Reactor Vessel Water Level—Low Low Low, Level 1; Drywell Pressure—High; ADS Drywell Pressure Bypass Timer; and two low pressure ECCS Discharge Pressure—High contacts (one from each divisional pump). To initiate an ADS trip system, the following applicable contacts must close in the associated string: Reactor Vessel Water Level—Low Low Low, Level 1; Drywell Pressure—High or ADS Drywell Pressure Bypass Timer; Reactor Vessel Water Level—Low, Level 3; ADS Initiation Timer (one string only); and one of the two low pressure ECCS Discharge Pressure—High contacts.

(continued)

All changes are 2 unless otherwise indicated

BASES

BACKGROUND

Automatic Depressurization System (continued)

Either ADS trip system A or trip system B will cause all the ADS ~~relief~~ valves to open. Once the Drywell Pressure—High or ADS initiation signals are present, they are individually sealed in until manually reset.

Manual initiation is accomplished by operating the control switch for each safety/relief valve (S/RV) associated with the ADS. Manual inhibit switches are provided in the control room for ADS; however, their function is not required for ADS OPERABILITY (provided ADS is not inhibited when required to be OPERABLE).

arming and depressing both ADS A trip system strings (Division 1) or both ADS B trip system strings (Division 2) which will cause the ADS valves to open with no time delay. No permissive interlocks are required for the manual initiation.

Diesel Generators

The Division 1, 2, and 3 DGs may be initiated by either automatic or manual means. Automatic initiation occurs for conditions of Reactor Vessel Water Level—Low Low Low, Level 1 or Drywell Pressure—High for DGs 11 and 12, and Reactor Vessel Water Level—Low Low, Level 2 or Drywell Pressure—High for DG 13. The DGs are also initiated upon loss of voltage signals. (Refer to Bases for LCO 3.3.8.1, "Loss of Power (LOP) Instrumentation," for a discussion of these signals.) Each of these diverse variables is monitored by two redundant transmitters per DG, which are, in turn, connected to two trip units. The outputs of the four divisionalized trip units (two trip units from each of the two variables) are connected to relays whose contacts are connected to a one-out-of-two taken twice logic. The DGs receive their initiation signals from the associated Divisions' ECCS logic (i.e., DG 11 receives an initiation signal from Division 1 ECCS (LPCS and LPCI A); DG 12 receives an initiation signal from Division 2 ECCS (LPCI B and LPCI C); and DG 13 receives an initiation signal from Division 3 ECCS (HPCS)). The DGs can also be started manually from the control room and locally in the associated DG room. The DG initiation signal is a sealed in signal and must be manually reset. The DG initiation logic is reset by resetting the associated ECCS initiation logic. Upon receipt of a LOCA initiation signal, each DG is automatically started, is ready to load in approximately 10 seconds, and will run in standby conditions (rated voltage and speed, with the DG output breaker open). The DGs will only energize their respective Engineered Safety

0

1A(2A)

1B(2B)

0

1A/2A

1B/2B

13

emergency

DG 0 is common to both units and will start on an initiation signal from both units. The other DGs will only start on an initiation signal from the unit ECCS logic.

(continued)

BASES

BACKGROUND

Diesel Generators (continued)

2 ~~Feature (ESF)~~ buses if a loss of offsite power occurs. (Refer to Bases for LCO 3.3.8.1.)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The actions of the ECCS are explicitly assumed in the safety analyses of References 1, 2, and 3. The ECCS is initiated to preserve the integrity of the fuel cladding by limiting the post LOCA peak cladding temperature to less than the 10 CFR 50.46 limits.

ECCS instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii) 2. Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the ECCS instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.5.1-1. Each Function must have a required number of OPERABLE channels, with their setpoints within the specified Allowable Values, where appropriate. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. ~~Each ECCS subsystem must also respond within its assumed response time.~~ 4 Table 3.3.5.1-1, footnote (b), is added to show that certain ECCS instrumentation Functions are also required to be OPERABLE to perform DG initiation ~~and actuation of other Technical Specifications (TS) equipment~~.

Allowable Values are specified for each ECCS Function specified in the ~~t~~able. 1 Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Insert ASA

2

from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined, accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

In general, the individual Functions are required to be OPERABLE in the MODES or other specified conditions that may require ECCS (or DG) initiation to mitigate the consequences of a design basis accident or transient. To ensure reliable ECCS and DG function, a combination of Functions is required to provide primary and secondary initiation signals.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

Low Pressure Core Spray and Low Pressure Coolant Injection Systems

1.a, 2.a Reactor Vessel Water Level—Low Low Low, Level 1

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. The low pressure ECCS and associated DGs are initiated at Level 1 to ensure that core spray and flooding functions are available to prevent or minimize fuel damage. The Reactor Vessel Water Level—Low Low Low, Level 1 is one of the Functions assumed to be OPERABLE and capable of initiating the ECCS during the transients analyzed in References 1 and 3. In addition, the Reactor Vessel Water Level—Low Low Low, Level 1 Function is directly assumed in the analysis of the recirculation line break (Ref. 2). The core cooling function of the ECCS, along with the scram action of the Reactor Protection System (RPS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a, 2.a Reactor Vessel Water Level—Low Low Low, Level 1 (continued)

differential pressure 2

Reactor Vessel Water Level—Low Low Low, Level 1 signals are initiated from four ~~level~~ transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.
The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is chosen to allow time for the low pressure core flooding systems to activate and provide adequate cooling.

and the associated Division 1 DG

2

and Division 2 DG

Two channels of Reactor Vessel Water Level—Low Low Low, Level 1 Function per associated Division are only required to be OPERABLE when the associated ECCS ~~or DG~~ is required to be OPERABLE, to ensure that no single instrument failure can preclude ECCS initiation. (Two channels input to LPCS, ~~and~~ LPCI A, while the other two channels input to LPCI B, ~~and~~ LPCI C.) Refer to LCO 3.5.1 and LCO 3.5.2, "ECCS—Shutdown," for Applicability Bases for the low pressure ECCS subsystems; ~~LCO 3.8.1, "AC Sources—Operating"; and LCO 3.8.2, "AC Sources—Shutdown," for Applicability Bases for the DGs.~~ 4 4

1.b, 2.b. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The low pressure ECCS and associated DGs are initiated upon receipt of the Drywell Pressure—High Function in order to minimize the possibility of fuel damage. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

switches 2

High drywell pressure signals are initiated from four pressure ~~transmitters~~ that sense drywell pressure. The Allowable Value was selected to be as low as possible and be indicative of a LOCA inside primary containment. ~~Negative barometric fluctuations are accounted for in the Allowable Value.~~ 2

is 4

The Drywell Pressure—High Function is required to be OPERABLE when the associated ECCS ~~and DGs are~~ required to be OPERABLE in conjunction with times when the primary

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b, 2.b. Drywell Pressure—High (continued)

containment is required to be OPERABLE. Thus, four channels of the LPCS and LPCI Drywell Pressure—High Function are required to be OPERABLE in MODES 1, 2, and 3 to ensure that no single instrument failure can preclude ECCS initiation. (Two channels input to LPCS, ~~and~~ LPCI A, and the Division 1 DG while the other two channels input to LPCI B, ~~and~~ LPCI C, and the Division 2 DG.) In MODES 4 and 5, the Drywell Pressure—High Function is not required since there is insufficient energy in the reactor to pressurize the primary containment to Drywell Pressure—High setpoint. Refer to LCO 3.5.1 for Applicability Bases for the low pressure ECCS subsystems ~~and to LCO 3.8.1 for Applicability Bases for the DGs~~. 4

2 7

1.c, 2.c. ~~Low Pressure Coolant Injection~~ LPCI Pump A and Pump B Start—Time Delay Relay

The purpose of this time delay is to stagger the start of the two ECCS pumps that are in each of Divisions 1 and 2, thus limiting the starting transients on the 4.16 kV emergency buses. This Function is only necessary when power is being supplied from the standby power sources (DG). ~~However, since the time delay does not degrade ECCS operation, it remains in the pump start logic at all times.~~ On ECCS initiation, the time delay is bypassed if the normal feed breaker to the Class 1E switchgear is closed. The LPCI Pump Start—Time Delay Relays are assumed to be OPERABLE in the accident and transient analyses requiring ECCS initiation. That is, the analysis assumes that the pumps will initiate when required and excess loading will not cause failure of the standby power sources (DG). 1

There are two LPCI Pump Start—Time Delay Relays, one in each of the RHR "A" and RHR "B" pump start logic circuits. While each time delay relay is dedicated to a single pump start logic, a single failure of a LPCI Pump Start—Time Delay Relay could result in the failure of the two low pressure ECCS pumps, powered from the same ~~ESF~~ emergency bus, to perform their intended function within the assumed ECCS RESPONSE TIMES (e.g., as in the case where both ECCS pumps on one ~~ESF~~ emergency bus start simultaneously due to an inoperable time delay relay). This still leaves two of the four low pressure ECCS pumps OPERABLE; thus, the single failure criterion is met (i.e., loss of one instrument does not preclude ECCS initiation). The Allowable Value for the LPCI Pump Start—Time Delay Relay is chosen to be long enough so that most of the starting transient of the first pump is 4

(continued)

All changes are [2] unless otherwise indicated

BASES

LPCI [1]

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.c, 2.c. Low Pressure Coolant Injection Pump A and Pump B Start—Time Delay Relay (continued)

complete before starting the second pump on the same 4.16 kV emergency bus and short enough so that ECCS operation is not degraded. [4]

Each LPCI Pump Start—Time Delay Relay Function is ~~only~~ required to be OPERABLE when the associated LPCI subsystem is required to be OPERABLE. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the LPCI subsystems.

[4] 1.g

2.f

1.d, 2.d. Reactor Steam Dome Pressure—Low (Injection Permissive)

and LPCS and LPCI Injection Line Pressure - Low (Injection Permissive)

[1] (Injection Permissive)

and injection line pressure

Low reactor steam dome pressure signals are used as permissives for the low pressure ECCS subsystems. This ensures that, prior to opening the injection valves of the low pressure ECCS subsystems, the reactor pressure has fallen to a value below these subsystems' maximum design pressure. The Reactor Steam Dome Pressure—Low ~~is one~~ of the Functions assumed to be OPERABLE and capable of permitting initiation of the ECCS during the transients analyzed in References 1 and 3. In addition, the Reactor Steam Dome Pressure—Low Function ~~is~~ directly assumed in the analysis of the recirculation line break (Ref. 2). The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

[3] (Injection Permissive) and LPCS and LPCI Injection Line Pressure - Low

are two

are

and LPCS and LPCI Injection Line Pressure - Low

switches

The Reactor Steam Dome Pressure—Low signals are initiated from four pressure ~~transmitters~~ that sense the reactor dome pressure. ~~The four pressure transmitters each drive a master and slave trip unit (for a total of eight trip units).~~

(Injection Permissive)

[1]

The LPCS and LPCI Injection Line Pressure - Low (Injection Permissive) signal are initiated from four pressure switches that sense the pressure in the injection line (one switch for each low pressure ECCS injection line).

(5) are

The Allowable Value ~~is~~ low enough to prevent overpressurizing the equipment in the low pressure ECCS, but high enough to ensure that the ECCS injection prevents the fuel peak cladding temperature from exceeding the limits of 10 CFR 50.46.

(Injection Permissive) [1]

Two

~~Three~~ channels of Reactor Steam Dome Pressure—Low Function ~~per associated Division~~ are only required to be OPERABLE when the associated ECCS is required to be OPERABLE to ensure that no single instrument failure can preclude ECCS

and one channel of LPCS and LPCI Injection Line Pressure - Low (Injection Permissive) per associated injection line

(continued)

All changes are 2 unless otherwise indicated

4 1.g. 1.f.

and LPCS and LPCI Injection Line Pressure — Low (Injection Permissive)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.d. 2.d. Reactor Steam Dome Pressure—Low (Injection Permissive) (continued)

of Reactor Vessel Pressure - Low (Injection Permissive)

initiation. (Three channels are required for LPCS and LPCI A, while three other channels are required for LPCI B and LPCI C.) Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.

Two

two

In addition, one channel of LPCS Injection Line Pressure — Low (Injection Permissive) is required for LPCS, while one channel of LPCI Injection Line Pressure is required for each LPCI subsystem

1.e. 1.f. 2.e. Low Pressure Coolant Injection and Low Pressure Core Spray Pump Discharge Flow—Low (Bypass)

LPCS and LPCI

The minimum flow instruments are provided to protect the associated low pressure ECCS pump from overheating when the pump is operating and the associated injection valve is not fully open. The minimum flow line valve is opened when low flow is sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump. The LPCI and LPCS Pump Discharge Flow—Low Functions are assumed to be OPERABLE and capable of closing the minimum flow valves to ensure that the low pressure ECCS flows assumed during the transients and accidents analyzed in References 1, 2, and 3 are met. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

sufficiently

(Bypass)

3 1

One flow transmitter per ECCS pump is used to detect the associated subsystems' flow rates. The logic is arranged such that each transmitter causes its associated minimum flow valve to open. The logic will close the minimum flow valve once the closure setpoint is exceeded. The LPCI minimum flow valves are time delayed such that the valves will not open for 10 seconds after the switches detect low flow. The time delay is provided to limit reactor vessel inventory loss during the startup of the RHR shutdown cooling mode (for RHR A and RHR B). The Pump Discharge Flow—Low Allowable Values are high enough to ensure that the pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core.

when flow is low with the pump running

switch

approximately 8 second

(Bypass)

Each channel of Pump Discharge Flow—Low Function (one LPCS channel and three LPCI channels) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE, to ensure that no single instrument failure can preclude the ECCS function. Refer to LCO 3.5.1 and

(continued)

All changes are 2 unless otherwise indicated

BASES

1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.e, 1.f, 2.e. Low Pressure Coolant Injection and Low Pressure Core Spray Pump Discharge Flow—Low (Bypass) (continued)

LPCS and LPCI

LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.

9 4

1.g, 2.f. Manual Initiation

4 h

The Manual Initiation push button channels introduce signals into the appropriate ECCS logic to provide manual initiation capability and are redundant to the automatic protective instrumentation. There is one push button for each of the two Divisions of low pressure ECCS (i.e., Division 1 ECCS, LPCS and LPCI A; Division 2 ECCS, LPCI B and LPCI C).

u

The Manual Initiation Function is not assumed in any accident or transient analyses in the FSAR. However, the Function is retained for overall redundancy and diversity of the low pressure ECCS function as required by the NRC in the plant licensing basis.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons. Each channel of the Manual Initiation Function (one channel per Division) is only required to be OPERABLE when the associated ECCS is required to be OPERABLE. Refer to LCO 3.5.1 and LCO 3.5.2 for Applicability Bases for the low pressure ECCS subsystems.

High Pressure Core Spray System

3.a. Reactor Vessel Water Level—Low Low, Level 2

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the HPCS System and associated DG is initiated at Level 2 to maintain level above the top of the active fuel. The Reactor Vessel Water Level—Low Low, Level 2 is one of the Functions assumed to be OPERABLE and capable of initiating HPCS during the transients analyzed in References 1 and 3. The Reactor Vessel Water Level—Low Low, Level 2 Function associated with HPCS is directly assumed in the analysis of the recirculation line break (Ref. 2). The core cooling

(continued)

All changes are [2] unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.a. Reactor Vessel Water Level—Low Low, Level 2 (continued)

function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from four ~~level~~ differential pressure transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

[1]

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value is chosen such that for complete loss of feedwater flow, the Reactor Core Isolation Cooling (RCIC) System flow with HPCS assumed to fail will be sufficient to avoid initiation of low pressure ECCS at Reactor Vessel Water Level—Low Low Low, Level 1.

Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are only required to be OPERABLE when HPCS is required to be OPERABLE to ensure that no single instrument failure can preclude HPCS initiation. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases.

3.b. Drywell Pressure—High

High pressure in the drywell could indicate a break in the RCPB. The HPCS System and associated DG are initiated upon receipt of the Drywell Pressure—High Function in order to minimize the possibility of fuel damage. ~~The Drywell Pressure—High Function is not assumed in the analysis of the recirculation line break (Ref. 2); that is, HPCS is assumed to be initiated on Reactor Water Level—Low Low, Level 2.~~ The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

Drywell Pressure—High signals are initiated from four pressure ~~transmitters~~ switches that sense drywell pressure. The Allowable Value was selected to be as low as possible and be indicative of a LOCA inside primary containment.

(continued)

All changes are $\boxed{2}$ unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.b. Drywell Pressure—High (continued)

The Drywell Pressure—High Function is required to be OPERABLE when HPCS is required to be OPERABLE in conjunction with times when the primary containment is required to be OPERABLE. Thus, four channels of the HPCS Drywell Pressure—High Function are required to be OPERABLE in MODES 1, 2, and 3, to ensure that no single instrument failure can preclude ECCS initiation. In MODES 4 and 5, the Drywell Pressure—High Function is not required since there is insufficient energy in the reactor to pressurize the drywell to the Drywell Pressure—High Function~~'s~~ setpoint. $\boxed{3}$ Refer to LCO 3.5.1 for the Applicability Bases for the HPCS System.

3.c. Reactor Vessel Water Level—High, Level 8

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the Level 8 signal is used to close the HPCS injection valve to prevent overflow into the main steam lines (MSLs). The Reactor Vessel Water Level—High, Level 8 Function for HPCS isolation is not ~~assumed~~ credited in the accident ~~and transient~~ analys~~es~~is. It was retained since it is a potentially significant contributor to risk.

$\boxed{1}$ – ¶ Reactor Vessel Water Level—High, Level 8 signals for HPCS are initiated from two level transmitters from the narrow range water level measurement instrumentation. ~~Both Level 8 signals are required in order to close the HPCS injection valve.~~ $\boxed{1}$ This ensures that ~~no single instrument failure can preclude HPCS initiation.~~ The Reactor Vessel Water Level—High, Level 8 Allowable Value is chosen to isolate flow from the HPCS System prior to water overflowing into the MSLs.

Two channels of Reactor Vessel Water Level—High, Level 8 Function are only required to be OPERABLE when HPCS is required to be OPERABLE. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases. to

~~3.d. Condensate Storage Tank Level—Low~~

~~Low level in the CST indicates the unavailability of an adequate supply of makeup water from this normal source. Normally the suction valves between HPCS and the CST are open and, upon receiving a HPCS initiation signal, water for~~ $\boxed{4}$

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.d. Condensate Storage Tank Level—Low (continued)

HPCS injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, first the suppression pool suction valve automatically opens, and then the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the HPCS pump. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valve must be open before the CST suction valve automatically closes. The Function is implicitly assumed in the accident and transient analyses (which take credit for HPCS) since the analyses assume that the HPCS suction source is the suppression pool.

Condensate Storage Tank Level—Low signals are initiated from two level transmitters. The logic is arranged such that either transmitter and associated trip unit can cause the suppression pool suction valve to open and the CST suction valve to close. The Condensate Storage Tank Level—Low Function Allowable Value is high enough to ensure adequate pump suction head while water is being taken from the CST. 4

Two channels of the Condensate Storage Tank Level—Low Function are only required to be OPERABLE when HPCS is required to be OPERABLE to ensure that no single instrument failure can preclude HPCS swap to suppression pool source. Thus, the Function is required to be OPERABLE in MODES 1, 2, and 3. In MODES 4 and 5, the Function is required to be OPERABLE only when HPCS is required to be OPERABLE to fulfill the requirements of LCO 3.5.2, HPCS is aligned to the CST, and the CST water level is not within the limits of SR 3.5.2.2. With CST water level within limits, a sufficient supply of water exists for injection to minimize the consequences of a vessel draindown event. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases.

3.e. Suppression Pool Water Level—High

Excessively high suppression pool water could result in the loads on the suppression pool exceeding design values should there be a blowdown of the reactor vessel pressure through the S/RVs. Therefore, signals indicating high suppression pool water level are used to transfer the suction source of

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.e. Suppression Pool Water Level—High (continued)

HPCS from the CST to the suppression pool to eliminate the possibility of HPCS continuing to provide additional water from a source outside containment. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valve must be open before the CST suction valve automatically closes. This Function is implicitly assumed in the accident and transient analyses (which take credit for HPCS) since the analyses assume that the HPCS suction source is the suppression pool.

4

Suppression Pool Water Level—High signals are initiated from two level transmitters. The logic is arranged such that either transmitter and associated trip unit can cause the suppression pool suction valve to open and the CST suction valve to close. The Allowable Value for the Suppression Pool Water Level—High Function is chosen to ensure that HPCS will be aligned for suction from the suppression pool before the water level reaches the point at which suppression pool design loads would be exceeded.

Two channels of Suppression Pool Water Level—High Function are only required to be OPERABLE in MODES 1, 2, and 3 when HPCS is required to be OPERABLE to ensure that no single instrument failure can preclude HPCS swap to suppression pool source. In MODES 4 and 5, the Function is not required to be OPERABLE since the reactor is depressurized and vessel blowdown, which could cause the design values of the containment to be exceeded, cannot occur. Refer to LCO 3.5.1 for HPCS Applicability Bases.

4 d

3.~~f~~. 3.~~g~~. e HPCS Pump Discharge Pressure—High (Bypass) and HPCS System Flow Rate—Low (Bypass)

sufficiently 2

The minimum flow instruments are provided to protect the HPCS pump from overheating when the pump is operating and the associated injection valve is not ~~fully~~ open. The minimum flow line valve is opened when low flow and high pump discharge pressure are sensed, and the valve is automatically closed when the flow rate is adequate to protect the pump or the discharge pressure is low (indicating the HPCS pump is not operating). The HPCS System Flow Rate—Low, and HPCS Pump Discharge Pressure—High (Bypass) Functions are assumed to be OPERABLE and capable of closing the minimum flow valve to ensure that the ECCS flow assumed

1

(continued)

All changes are [2] unless otherwise indicated

d e [4]

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.c, 3.d. HPCS Pump Discharge Pressure—High (Bypass) and HPCS System Flow Rate—Low (Bypass) (continued)

during the transients and accidents analyzed in References 1, 2, and 3 are met. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

switch

One flow ~~transmitter~~ is used to detect the HPCS System's flow rate. The logic is arranged such that the ~~transmitter~~ causes the minimum flow valve to open, provided ~~the~~ HPCS pump discharge pressure, sensed by another ~~transmitter~~, is high enough (indicating the pump is operating). The logic will close the minimum flow valve once the closure setpoint is exceeded. (The valve will also close upon HPCS pump discharge pressure decreasing below the setpoint.)

switch

(Bypass) (5) are [5]

The HPCS System Flow Rate—Low ~~and HPCS Pump Discharge Pressure—High~~ Allowable Value ~~is~~ high enough to ensure that pump flow rate is sufficient to protect the pump, yet low enough to ensure that the closure of the minimum flow valve is initiated to allow full flow into the core. The HPCS Pump Discharge Pressure—High Allowable Value is set high enough to ensure that the valve will not be open when the pump is not operating.

[4]

One channel of each Function is required to be OPERABLE when the HPCS is required to be OPERABLE. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases.

f

3.e. Manual Initiation

The Manual Initiation push button channel introduces a signal into the HPCS logic to provide manual initiation capability and is redundant to the automatic protective instrumentation. There is one push button for the HPCS System.

e u

The Manual Initiation Function is not assumed in any accident or transient analys~~is~~ in the FSAR. However, the Function is retained for overall redundancy and diversity of the HPCS function as required by the NRC in the plant licensing basis.

(continued)

f 4

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.f. Manual Initiation (continued)

There is no Allowable Value for this Function since the channel is mechanically actuated based solely on the position of the push button. One channel of the Manual Initiation Function is only required to be OPERABLE when the HPCS System is required to be OPERABLE. Refer to LCO 3.5.1 and LCO 3.5.2 for HPCS Applicability Bases.

Automatic Depressurization System

4.a, 5.a. Reactor Vessel Water Level—Low Low Low, Level 1

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, ADS receives one of the signals necessary for initiation from this Function. The Reactor Vessel Water Level—Low Low Low, Level 1 is one of the Functions assumed to be OPERABLE and capable of initiating the ADS during the accidents analyzed in Reference 2. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

differential pressure 2

Reactor Vessel Water Level—Low Low Low, Level 1 signals are initiated from four ~~level~~ transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. ¶ Four channels of Reactor Vessel Water Level—Low Low Low, Level 1 Function are only required to be OPERABLE when ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. (Two channels input to ADS trip system A while the other two channels input to ADS trip system B). Refer to LCO 3.5.1 for ADS Applicability Bases.

chosen 2

The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is high enough to allow time for the low pressure core ~~flooding~~ systems to initiate and provide adequate cooling. 1

spray and injection 2

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.b. 5.b. Drywell Pressure—High

High pressure in the drywell could indicate a break in the RCPB. Therefore, ADS receives one of the signals necessary for initiation from this Function in order to minimize the possibility of fuel damage. The Drywell Pressure—High is assumed to be OPERABLE and capable of initiating the ADS during the accidents analyzed in Reference 2. The core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

Drywell Pressure—High signals are initiated from four pressure ~~transmitters~~ switches [2] that sense drywell pressure. The Allowable Value was selected to be as low as possible and be indicative of a LOCA inside primary containment.

Four channels of Drywell Pressure—High Function are only required to be OPERABLE when ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. (Two channels input to ADS trip system A while the other two channels input to ADS trip system B.) Refer to LCO 3.5.1 for ADS Applicability Bases.

4.c. 5.c. ADS Initiation Timer

The purpose of the ADS Initiation Timer is to delay depressurization of the reactor vessel to allow the HPCS System time to maintain reactor vessel water level. Since the rapid depressurization caused by ADS operation is one of the most severe transients on the reactor vessel, its occurrence should be limited. By delaying initiation of the ADS Function, the operator is given the chance to monitor the success or failure of the HPCS System to maintain water level, and then to decide whether or not to allow ADS to initiate, to delay initiation further by recycling the timer, or to inhibit initiation permanently. The ADS Initiation Timer Function is assumed to be OPERABLE for the accident analyses of Reference 2 that require ECCS initiation and assume failure of the HPCS System.

There are two ADS Initiation Timer relays, one in each of the two ADS trip systems. The Allowable Value for the ADS Initiation Timer is chosen to be short enough so that there is still time after depressurization for the low pressure ECCS subsystems to provide adequate core cooling.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4.c. 5.c. ADS Initiation Timer (continued)

Two channels of the ADS Initiation Timer Function are only required to be OPERABLE when the ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. (One channel inputs to ADS trip system A while the other channel inputs to ADS trip system B.) Refer to LCO 3.5.1 for ADS Applicability Bases.

(Confirmatory)

5

4.d. 5.d. Reactor Vessel Water Level—Low, Level 3

(Confirmatory)

The Reactor Vessel Water Level—Low, Level 3 Function is used by the ADS only as a confirmatory low water level signal. ADS receives one of the signals necessary for initiation from Reactor Vessel Water Level—Low Low Low, Level 1 signals. In order to prevent spurious initiation of the ADS due to spurious Level 1 signals, a Level 3 signal must also be received before ADS initiation commences.

5

(Confirmatory)

differential pressure

2

Reactor Vessel Water Level—Low, Level 3 signals are ~~initiated from two~~ level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. The Allowable Value for Reactor Vessel Water Level—Low, Level 3 is selected at the RPS Level 3 scram Allowable Value for convenience. Refer to LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," for Bases discussion of this Function.

Two channels of Reactor Vessel Water Level—Low, Level 3 Function are only required to be OPERABLE when the ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. (One channel inputs to ADS trip system A while the other channel inputs to ADS trip system B.) Refer to LCO 3.5.1 for ADS Applicability Bases.

LPCS

LPCI

1

4.e. 4.f. 5.e. ~~Low Pressure Core Spray~~ and ~~Low Pressure Coolant Injection~~ Pump Discharge Pressure—High

(indicating that the associated pump is running)

2

The Pump Discharge Pressure—High signals from the LPCS and LPCI pumps are used as permissives for ADS initiation, indicating that there is a source of low pressure cooling water available once the ADS has depressurized the vessel. Pump Discharge Pressure—High is one of the Functions assumed to be OPERABLE and capable of permitting ADS

(continued)

BASES

LPCS LPCI 1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4.e, 4.f, 5.e. ~~Low Pressure Core Spray~~ and ~~Low Pressure Coolant Injection~~ Pump Discharge Pressure—High (continued)

initiation during the events analyzed in References 2 and 3 with an assumed HPCS failure. For these events, the ADS depressurizes the reactor vessel so that the low pressure ECCS can perform the core cooling functions. This core cooling function of the ECCS, along with the scram action of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46.

switches 2

Pump discharge pressure signals are initiated from eight pressure ~~transmitters~~, two on the discharge side of each of the four low pressure ECCS pumps. In order to generate an ADS permissive in one trip system, it is necessary that only one pump (both channels for the pump) indicate the high discharge pressure condition. The Pump Discharge Pressure—High Allowable Value is less than the pump discharge pressure when the pump is operating in a full flow mode, and high enough to avoid any condition that results in a discharge pressure permissive when the LPCS and LPCI pumps are aligned for injection and the pumps are not running. The actual operating point of this Function is not assumed in any transient or accident analysis.

Eight channels of LPCS and LPCI Pump Discharge Pressure—High Function (two LPCS and two LPCI A channels input to ADS trip system A, while two LPCI B and two LPCI C channels input to ADS trip system B) are only required to be OPERABLE when the ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. Refer to LCO 3.5.1 for ADS Applicability Bases.

4.g, 5.f. ADS Bypass Timer ~~(High Drywell Pressure)~~ 4

One of the signals required for ADS initiation is Drywell Pressure—High. However, if the event requiring ADS initiation occurs outside the drywell (for example, main steam line break outside primary containment), a high drywell pressure signal may never be present. Therefore, the ~~ADS~~ Bypass Timer is used to bypass the Drywell Pressure—High Function after a certain time period has elapsed. ~~Operation of~~ the ~~ADS~~ Bypass Timer Function ~~is not assumed in any accident or transient analysis. The~~ instrumentation is retained in the TS because ADS is part of the primary success path for mitigation of a DBA.

Drywell Pressure 4

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

~~4.g.~~ 5.f. ADS Bypass Timer (High Drywell Pressure) 4
(continued)

Drywell Pressure

There are four ADS Bypass Timer relays, two in each of the two ADS trip systems. The Allowable Value for the ADS Timer is chosen to be short enough that so that there is still time after depressurization for the low pressure ECCS subsystems to provide adequate core cooling. 4

Drywell Pressure

Four channels of the ADS Bypass Timer Function are only required to be OPERABLE when the ADS is required to be OPERABLE to ensure that no single instrument failure can preclude ADS initiation. Refer to LCO 3.5.1 for ADS Applicability Bases.

~~4.h.~~ 5.g. Manual Initiation

The Manual Initiation push button channels introduce signals into the ADS logic to provide manual initiation capability and are redundant to the automatic protective instrumentation. There are two push buttons for each ADS trip system (total of four).

u 2

The Manual Initiation Function is not assumed in any accident or transient analyses in the FSAR. However, the Function is retained for overall redundancy and diversity of the ADS function as required by the NRC in the plant licensing basis.

There is no Allowable Value for this Function since the channel is mechanically actuated based solely on the position of the push buttons. Four channels of the Manual Initiation Function (two channels per ADS trip system) are only required to be OPERABLE when the ADS is required to be OPERABLE. Refer to LCO 3.5.1 for ADS Applicability Bases.

ACTIONS

~~[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]~~ 6

A Note has been provided to modify the ACTIONS related to ECCS instrumentation channels. Section 1.3, Completion

(continued)

BASES

ACTIONS (continued)

Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable ECCS instrumentation channels provide appropriate compensatory measures for separate inoperable Condition entry for each inoperable ECCS instrumentation channel.

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.5.1-1. The applicable Condition specified in the ~~t~~able is Function dependent. Each time a channel is discovered to be inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition. 1

B.1, B.2, and B.3

Required Actions B.1 and B.2 are intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function (or in some cases, within the same variable) result in redundant automatic initiation capability being lost for the feature(s). Required Action B.1 features would be those that are initiated by Functions 1.a, 1.b, 2.a, and 2.b (~~e.g.~~ i.e., low pressure ECCS). The Required Action B.2 feature would be HPCS System and associated DG. For Required Action B.1, redundant automatic initiation capability is lost if either (a) one or more Function 1.a channels and one or more Function 2.a channels are inoperable and untripped, or (b) one or more Function 1.b channels and one or more Function 2.b channels are inoperable and untripped.

Loss of redundant automatic capability for the low pressure ECCS injection feature in both divisions occurs when the initiation capability is available to less than two pumps from any single variable.

2 and associated DGs

2 1

For Divisions 1 and 2, since each inoperable channel would have Required Action B.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected portion of the associated Division of low pressure ECCS and DG to be declared inoperable. However, since channels in both Divisions are inoperable and

(continued)

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

untripped, and the Completion Times started concurrently for the channels in both Divisions, this results in the affected portions in both Divisions of ECCS and DG being concurrently declared inoperable.

(i.e., loss of automatic start capability for either Functions 3a or 3.b)

For Required Action B.2, redundant automatic initiation capability is lost if two Function 3.a or two Function 3.b channels are inoperable and untripped in the same trip system. In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Required Action B.3 is not appropriate and the feature(s) associated with the inoperable, untripped channels must be declared inoperable within 1 hour. As noted (Note 1 to Required Action B.1 and Required Action B.2), the two Required Actions are only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of initiation capability for 24 hours (as allowed by Required Action B.3) is allowed during MODES 4 and 5. Notes are also provided (Note 2 to Required Action B.1 and Required Action B.2) to delineate which Required Action is applicable for each Function that requires entry into Condition B if an associated channel is inoperable. This ensures that the proper loss of initiation capability check is performed.

2 paralell contacts (channels)

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that a redundant feature in both Divisions (e.g., any Division 1 ECCS and Division 2 ECCS) cannot be automatically initiated due to inoperable, untripped channels within the same variable as described in the paragraph above. For Required Action B.2, the Completion Time only begins upon discovery that the HPCS System cannot be automatically initiated due to two inoperable, untripped channels for the associated Function in the same trip system. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

2 (paralell contacts)

(continued)

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 4) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action B.3. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition ~~H~~ G 4 must be entered and its Required Action taken.

C.1 and C.2

Required Action C.1 is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the same Function (or in some cases, within the same variable) result in redundant automatic initiation capability being lost for the feature(s). Loss of redundant automatic initiation capability for the low pressure ECCS injection feature in both divisions occurs when the initiation capability is available to less than two pumps from any single variable. 2 Required Action C.1 features would be those that are initiated by Functions 1.c, ~~1.d,~~ and 2.c~~, and 2.d~~ (i.e., low pressure ECCS). 4 For Functions 1.c and 2.c, redundant automatic initiation capability is lost if the Function 1.c and Function 2.c channels are inoperable. ~~For Functions 1.d and 2.d, redundant automatic initiation capability is lost if two Function 1.d channels in the same trip system and two Function 2.d channels in the same trip system (but not necessarily the same trip system as the Function 1.d channels) are inoperable.~~ 4 Since each inoperable channel would have Required Action C.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected portion of the associated Division to be declared inoperable. However, since channels in both Divisions are inoperable, and the Completion Times started concurrently for the channels in both Divisions, this results in the affected portions in both Divisions being concurrently declared inoperable. For Functions 1.c and 2.c, the affected portions of the Division are LPCI A and LPCI B, respectively. ~~For Functions 1.d and 2.d, the~~ In addition, the specific inoperability of these Functions should also be evaluated for impact on the DGs. 1

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

affected portions of the Division are the low pressure ECCS pumps (Divisions 1 and 2, respectively).

In this situation (loss of redundant automatic initiation capability), the 24 hour allowance of Required Action C.2 is not appropriate and the feature(s) associated with the inoperable channels must be declared inoperable within 1 hour. As noted (Note 1), the Required Action is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of automatic initiation capability for 24 hours (as allowed by Required Action C.2) is allowed during MODES 4 and 5.

Note 2 states that Required Action C.1 is only applicable for Functions 1.c, ~~1.d~~, 2.c, and 2.d. The Required Action is not applicable to Functions 1.g, 2.f, and 3.h (which also require entry into this Condition if a channel in these Functions is inoperable), since they are the Manual Initiation Functions and are not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action C.2) is allowed. Required Action C.1 is also not applicable to Function 3.c (which also requires entry into this Condition if a channel in this Function is inoperable), since the loss of one channel results in a loss of the Function (two-out-of-two logic). This loss was considered during the development of Reference 4 and considered acceptable for the 24 hours allowed by Required Action C.2.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action C.1, the Completion Time only begins upon discovery that the same feature in both Divisions (e.g., any Division 1 ECCS and Division 2 ECCS) cannot be automatically initiated due to inoperable channels within the same variable as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 4) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition ~~H~~ G must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action would either cause the initiation or would not necessarily result in a safe state for the channel in all events. 4

~~D.1, D.2.1, and D.2.2~~

~~Required Action D.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic component initiation capability for the HPCS System. Automatic component initiation capability is lost if two Function 3.d channels or two Function 3.e channels are inoperable and untripped. In this situation (loss of automatic suction swap), the 24 hour allowance of Required Actions D.2.1 and D.2.2 is not appropriate and the HPCS System must be declared inoperable within 1 hour after discovery of loss of HPCS initiation capability. As noted, the Required Action is only applicable if the HPCS pump suction is not aligned to the suppression pool, since, if aligned, the Function is already performed.~~ 4

~~The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action D.1, the Completion Time only begins upon discovery that the HPCS System cannot be automatically aligned to the suppression pool due to two inoperable, untripped channels in the same Function. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.~~

~~Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an~~

(continued)

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

allowable out of service time of 24 hours has been shown to be acceptable (Ref. 4) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action D.2.1 or the suction source must be aligned to the suppression pool per Required Action D.2.2. Placing the inoperable channel in trip performs the intended function of the channel (shifting the suction source to the suppression pool). Performance of either of these two Required Actions will allow operation to continue. If Required Action D.2.1 or Required Action D.2.2 is performed, measures should be taken to ensure that the HPCS System piping remains filled with water. Alternately, if it is not desired to perform Required Actions D.2.1 and D.2.2 (e.g., as in the case where shifting the suction source could drain down the HPCS suction piping), Condition H must be entered and its Required Action taken.

4

D.1, D.2, D.3, and D.4 4

~~E.1 and E.2~~

D 4

5

2

Required Action ~~E~~.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, ~~untripped~~ channels within the LPCS and LPCI Pump Discharge Flow—Low (Bypass) Functions result in redundant automatic initiation capability being lost for the feature(s). For Required Action ~~E~~.1, the features would be those that are initiated by Functions 1.e, 1.f, and ~~2.e~~ (e.g., low pressure ECCS). Redundant automatic initiation capability is lost if three of the four channels associated with Functions 1.e, 1.f, and 2.e are inoperable. Since each inoperable channel would have Required Action ~~E~~.1 applied separately (refer to ACTIONS Note), each inoperable channel would only require the affected low pressure ECCS pump to be declared inoperable. However, since channels for more than one low pressure ECCS pump are inoperable, and the Completion Times started concurrently for the channels of the low pressure ECCS pumps, this results in the affected low pressure ECCS pumps being concurrently declared inoperable.

, the Injection Line Pressure-Low (Injection Permissive), and the Reactor Steam Dome Pressure-Low (Injection Permissive Functions

5

INSERT D

2

4 D 1.d

1.g, 2.d, 2.e

2.f

D 4

Insert D.1 and D.2

2

In this situation (loss of redundant automatic initiation capability), the ~~7 day allowance~~ of Required ~~Action E.2 is~~ not appropriate and the feature(s) associated with each

Completion Times

Actions D.3 and D.4 are

4

(continued)

Insert D

Loss of redundant automatic initiation capability for the low pressure ECCS injection feature in both divisions occurs when the initiation capability is available to less than two pumps from any single variable. For the purposes of this Condition, the injection permissives on Reactor Steam Dome Pressure—Low and Injection Line Pressure—Low are considered the same variable. Similarly, Functions 1.e, 1.f, and 2.e are all minimum flow functions and considered the same variable.

Insert D.1 and D.2

For Function 1.d, redundant automatic initiation capability is lost if two Function 1.d channels are inoperable concurrent with either two inoperable Function 2.d channels or one inoperable Function 2.f channel. For Function 2.d, redundant automatic initiation capability is lost if two Function 2.d channels are inoperable concurrent with two inoperable 1.d channels or one inoperable 1.g channel. For Function 1.g, redundant automatic initiation capability is lost if two Function 1.g channels are inoperable concurrent with either two inoperable Function 2.d channels or one inoperable Function 2.f channel. For Function 2.f, redundant automatic initiation capability is lost if two Function 2.f channels are inoperable concurrent with two inoperable 1.d channels or one inoperable 1.g channel.

All changes are 4 unless otherwise indicated

BASES

ACTIONS ~~E.1 and E.2~~ D.1, D.2, D.3, and D.4 (continued)

for Functions 1.e, 1.f, and 2.e

inoperable channel must be declared inoperable within 1 hour after discovery of loss of initiation capability for feature(s) in both Divisions. As noted (Note 1 to Required Action ~~E~~ D.1), Required Action ~~E~~ D.1 is only applicable in MODES 1, 2, and 3. In MODES 4 and 5, the specific initiation time of the low pressure ECCS is not assumed and the probability of a LOCA is lower. Thus, a total loss of initiation capability for 7 days (as allowed by Required Action ~~E.2~~ D.4) is allowed during MODES 4 and 5. (This Condition is not entered when Functions 1.d, 1.g, 2.d, or 2.f are inoperable in MODES 4 and 5) 1 A Note is also provided (Note 2 to Required Action ~~E~~ D.1) to delineate that Required Action ~~E~~ D.1 is only applicable to low pressure ECCS Functions. Required Action ~~E~~ D.1 is not applicable to HPCS Functions 3.~~f~~ d and 3.~~g~~ e since the loss of one channel results in a loss of the Function (one-out-of-one logic). This loss was considered during the development of Reference 4 and considered acceptable for the 7 days allowed by Required Action ~~E.2~~ D.4.

Insert D.2

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action ~~E~~ D.1, the Completion Time only begins upon discovery that three channels of the ~~variable~~ Pump Discharge Flow—Low (Bypass) Function 5 cannot be automatically initiated due to inoperable channels or upon discovery of a loss of redundant initiation capability for the Reactor Steam Dome Pressure—Low (Injection Permissive and Injection Line Pressure—Low (Injection Permissive) Functions (as described above). The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Insert D.2.a

If the instrumentation that controls the pump minimum flow valve is inoperable such that the valve will not automatically open, extended pump operation with no injection path available could lead to pump overheating and failure. If there were a failure of the instrumentation such that the valve would not automatically close, a portion of the pump flow could be diverted from the reactor injection path, causing insufficient core cooling. These consequences can be averted by the operator's manual control of the valve, which would be adequate to maintain ECCS pump protection and required flow. Furthermore, other ECCS pumps would be sufficient to complete the assumed safety function if no additional single failure were to occur. 2 If a Reactor Vessel Pressure - Low (Injection Permissive) Function channel is inoperable, another channel exists to ensure the injection valves in the ECCS division can still open. The 7 day Completion Time of Required Action ~~E.2~~ D.4 to restore the

(continued)

Insert D.2

Required Action D.2 is intended to ensure that appropriate actions are taken if multiple, inoperable channels within the Reactor Steam Dome Pressure—Low (Injection Permissive) Function result in automatic initiation capability being lost for the features in one division. For Required Action D.2, the features would be those that are initiated by Functions 1.d and 2.d (e.g., low pressure ECCS). For Functions 1.d and 2.d, automatic initiation capability is lost in one division if two Function 1.d or two Function 2.d channels are inoperable. In this situation, (loss of automatic initiation capability), the 7 day allowance of Required Action D.4 is not appropriate and the features associated with the inoperable channels must be declared inoperable within 24 hours after discovery of loss of initiation capability for features in one division. For Functions 1.g and 2.f, an allowable out of service time of 24 hours is provided by Required Action D.3

Insert D.2a

For Required Action D.2, the Completion Time only begins upon discovery that two Function 1.d or two Function 2.d channels cannot be automatically initiated due to inoperable channels. The 24 hour Completion Time from discovery of loss of initiation capability for features in one division is acceptable because of the redundancy of the ECCS design, as shown in the reliability analysis of Reference 4.

BASES

ACTIONS ~~F.1 and F.2~~ D.1, D.2, D.3, and D.4 (continued)

4 G

inoperable channel to OPERABLE status is reasonable based on the remaining capability of the associated ECCS subsystems, the redundancy available in the ECCS design, and the low probability of a DBA occurring during the allowed out of service time. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition G must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action would not necessarily result in a safe state for the channel in all events.

4 E E 4 S 2

E.1 and E.2

Required Action E.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within similar ADS trip system Functions result in automatic initiation capability being lost for the ADS. Automatic initiation capability is lost if either (a) ~~more than~~ one or more Function 4.a channel and one or more Function 5.a channels are inoperable and untripped, (b) one or more Function 4.b channels ~~and one~~ or more Function 5.b channel are inoperable and untripped, or (c) one Function 4.d channel and one Function 5.d channel are inoperable and untripped.

2 2

In this situation (loss of automatic initiation capability), the 96 hour or 8 day allowance, as applicable, of Required Action E.2 is not appropriate, and all ADS valves must be declared inoperable within 1 hour after discovery of loss of ADS initiation capability in both trip systems.

4 E

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action E.1, the Completion Time only begins upon discovery that the ADS cannot be automatically initiated due to inoperable, untripped channels within similar ADS trip system Functions as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

(continued)

BASES

ACTIONS

E.1 and E.2 (continued) 4

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 8 days has been shown to be acceptable (Ref. 4) to permit restoration of any inoperable channel to OPERABLE status if both HPCS and RCIC are OPERABLE. If either HPCS or RCIC is inoperable, the time is shortened to 96 hours. If the status of HPCS or RCIC changes such that the Completion Time changes from 8 days to 96 hours, the 96 hours begins upon discovery of HPCS or RCIC inoperability. However, total time for an inoperable, untripped channel cannot exceed 8 days. If the status of HPCS or RCIC changes such that the Completion Time changes from 96 hours to 8 days, the "time zero" for beginning the 8 day "clock" begins upon discovery of the inoperable, untripped channel. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action E.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition G must be entered and its Required Action taken.

F.1 and F.2 4

Required Action F.1 is intended to ensure that appropriate actions are taken if multiple, inoperable channels within similar ADS trip system Functions result in automatic initiation capability being lost for the ADS. Automatic initiation capability is lost if either (a) one Function 4.c channel and one Function 5.c channel are inoperable, (b) one or more Function 4.e channels and one or more Function 5.e channels are inoperable, (c) one or more Function 4.f channels and one or more Function 5.e channels are inoperable, or (d) one or more Function 4.g channels and one or more Function 5.f channels are inoperable.

In this situation (loss of automatic initiation capability), the 96 hour or 8 day allowance, as applicable, of Required

(continued)

BASES

ACTIONS

F.1 and F.2 (continued)

Action F.2 is not appropriate, and all ADS valves must be declared inoperable within 1 hour after discovery of loss of ADS initiation capability in both trip systems. The Note to Required Action F.1 states that Required Action F.1 is only applicable for Functions 4.c, 4.e, 4.f, 4.g, 5.c, 5.e, and 5.f. Required Action F.1 is not applicable to Functions 4.h and 5.g (which also require entry into this Condition if a channel in these Functions is inoperable), since they are the Manual Initiation Functions and are not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 96 hours or 8 days (as allowed by Required Action F.2) is allowed.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action F.1, the Completion Time only begins upon discovery that the ADS cannot be automatically initiated due to inoperable channels within similar ADS trip system Functions, as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the diversity of sensors available to provide initiation signals and the redundancy of the ECCS design, an allowable out of service time of 8 days has been shown to be acceptable (Ref. 4) to permit restoration of any inoperable channel to OPERABLE status if both HPCS and RCIC are OPERABLE (Required Action F.2). If either HPCS or RCIC is inoperable, the time is reduced to 96 hours. If the status of HCPS or RCIC changes such that the Completion Time changes from 8 days to 96 hours, the 96 hours begins upon discovery of HPCS or RCIC inoperability. However, total time for an inoperable channel cannot exceed 8 days. If the status of HPCS or RCIC changes such that the Completion Time changes from 96 hours to 8 days, the "time zero" for beginning the 8 day "clock" begins upon discovery of the inoperable channel. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition G must be entered and its Required Action taken. The Required Actions do not allow placing the

(continued)

BASES

ACTIONS

F ~~F~~.1 and ~~F~~.2 (continued)

4

channel in trip since this action would not necessarily result in a safe state for the channel in all events.

G ~~G~~.1

With any Required Action and associated Completion Time not met, the associated feature(s) may be incapable of performing the intended function and the supported feature(s) associated with the inoperable untripped channels must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

~~[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]~~ 6

As noted at the beginning of the SRs, the SRs for each ECCS instrumentation Function are found in the SRs column of Table 3.3.5.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours as follows: (a) for Functions 3.c, 3.~~f~~ d, 3.~~g~~ e, and 3.~~h~~ f; and (b) for Functions other than 3.c, 3.~~f~~ d, 3.~~g~~ e, and 3.~~h~~ f provided the associated Function or redundant Function maintains ECCS initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 4) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the ECCS will initiate when necessary. 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.1.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon 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 channels required by the LCO.

SR 3.3.5.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the active channel will perform the intended function. 1

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of Reference 4.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.3.5.1.3~~

~~The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be not within its required Allowable Value specified in Table 3.3.5.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analyses. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than the setting accounted for in the appropriate setpoint methodology.~~

~~The Frequency of 92 days is based on the reliability analysis of Reference 4.~~

SR 3.3.5.1.4 and SR 3.3.5.1.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.5.1.4 is based upon the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis. The Frequency of SR 3.3.5.1.5 is based upon the assumption of an ~~18~~ 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.5.1.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.1, LCO 3.5.2, LCO 3.8.1, and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety function.

(continued)

4 5

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1.~~6~~ (continued) 24 7

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 unplanned transients if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the ~~[18]~~ month Frequency. 24 7

~~SR 3.3.5.1.7~~

~~This SR ensures that 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 Reference 5.~~

~~ECCS RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. The [18] month Frequency is consistent with the typical industry refueling cycle and is based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent.~~ 4

REFERENCES 2 U

1. U FSAR, Section ~~[~~5.2~~]~~. 7
2. U FSAR, Section ~~[~~6.3~~]~~.
3. U FSAR, Chapter ~~[~~15~~]~~.
4. NEDC-30936-P-A, "BWR Owners' Group Technical Specification Improvement Analyses for ECCS Actuation Instrumentation, Part s 1 and 2," December 1988. 2
5. ~~FSAR, Section [6.3], Table [6.3-2].~~

4

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.5.1 - ECCS INSTRUMENTATION

1. Editorial changes made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, analysis description, or licensing basis description.

3. Typographical/grammatical error corrected.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

5. Changes have been made to more closely reflect the requirements of the Specification.

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

7. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.3 INSTRUMENTATION

B 3.3.5.2 Reactor Core Isolation Cooling (RCIC) System Instrumentation

insufficient or 1

BASES

BACKGROUND

1 RCIC System initiation occurs and maintains sufficient reactor water level precluding

The purpose of the RCIC System instrumentation is to initiate actions to ensure adequate core cooling when the reactor vessel is isolated from its primary heat sink (the main condenser) and normal coolant makeup flow from the Reactor Feedwater System is unavailable, such that initiation of the low pressure Emergency Core Cooling Systems (ECCS) pumps ~~does not occur~~. A more complete discussion of RCIC System operation is provided in the Bases of LCO 3.5.3, "RCIC System."

2 2

2 Water Level-

2 differential pressure

2 The logic can also be initiated by use of a manual push button.

The RCIC System may be initiated by either automatic or manual means. Automatic initiation occurs for conditions of ~~reactor vessel~~ Low Low ~~water~~ ~~level~~. The variable is monitored by four transmitters that are connected to four trip units. The outputs of the trip units are connected to relays whose contacts are arranged in a one-out-of-two taken twice logic arrangement. Once initiated, the RCIC logic seals in and can be reset by the operator only when the reactor vessel water level signals have cleared.

2 1 2 to the reactor vessel

The RCIC test line isolation valve ~~(which is also a primary containment isolation valve)~~ is closed on a RCIC initiation signal to allow full system flow ~~and maintain containment isolated in the event RCIC is not operating~~.

2 2

2 there

The RCIC System also monitors the water level~~s~~ in the condensate storage tank (CST) ~~and the suppression pool~~, since ~~these~~ are ~~the~~ two sources of water for RCIC operation. Reactor grade water in the CST is the normal source. Upon receipt of a RCIC initiation signal, the CST suction valve is automatically signaled to open (it is normally in the open position) unless the pump suction from the suppression pool valve is open. If the water level in the CST falls below a preselected level, first the suppression pool suction valve automatically opens and then the CST suction valve automatically closes. Two level ~~transmitters~~ are used to detect low water level in the CST. Either switch can cause the suppression pool suction valve to open. ~~and the CST suction valve to close. The suppression pool suction valve also automatically opens and the CST suction valve closes if high water level is detected in the suppression pool~~

2 Switches

2

(continued)

BASES

BACKGROUND (continued)

(one-out-of-two logic similar to the CST water level logic). [2] To prevent losing suction to the pump, the suction valves are interlocked so that one suction path must be open before the other automatically closes.

[2] RCIC turbine steam inlet isolation

The RCIC System provides makeup water to the reactor until the reactor vessel water level reaches the high water level (Level 8) trip (two-out-of-two logic), at which time the RCIC steam supply, steam supply bypass, and cooling water supply valves close (the injection valve also closes due to the closure of the steam supply valves). [2] The RCIC System restarts if vessel level again drops to the low level initiation point (Level 2). [2]

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The function of the RCIC System, to provide makeup coolant to the reactor, is to respond to transient events. The RCIC System is not an Engineered Safety Feature System and no credit is taken in the safety analysis for RCIC System operation. Based on its contribution to the reduction of overall plant risk, however, the RCIC System, and therefore its instrumentation, ~~are included as required by the NRC Policy Statement.~~ meets Criterion 4 of 10CFR50.36(c)(2)(ii) [3] Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the RCIC System instrumentation is dependent on the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.5.2-1. Each Function must have a required number of OPERABLE channels with their setpoints within the specified Allowable Values, where appropriate. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

[1] Allowable Values are specified for each RCIC System instrumentation Function specified in the Table. T [1] Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Each Allowable Value specified accounts for instrument uncertainties appropriate [2]

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~to the Function. These uncertainties are described in the setpoint methodology.~~ 2

2 INSERT ASA

The individual Functions are required to be OPERABLE in MODE 1, and in MODES 2 and 3 with reactor steam dome pressure > 150 psig, since this is when RCIC is required to be OPERABLE. ~~(Refer to LCO 3.5.3 for Applicability Bases for the RCIC System.)~~ 1

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Reactor Vessel Water Level—Low Low, Level 2

Low reactor pressure vessel (RPV) water level indicates that normal feedwater flow is insufficient to maintain reactor vessel water level and that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the RCIC System is initiated at Level 2 to assist in maintaining water level above the top of the active fuel.

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from four ~~level~~ differential pressure 2 transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value is set high enough such that for complete loss of feedwater flow, the RCIC System flow with high pressure core spray assumed to fail will be sufficient to avoid initiation of low pressure ECCS at Level 1.

Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC initiation. Refer to LCO 3.5.3 for RCIC Applicability Bases.

(continued)

Insert ASA

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits (or design limits) are derived from the limiting values of the process parameters obtained from the safety analysis. The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

2 RCIC turbine steam inlet isolation

2 differential pressure

2. Reactor Vessel Water Level—High, Level 8

High RPV water level indicates that sufficient cooling water inventory exists in the reactor vessel such that there is no danger to the fuel. Therefore, the Level 8 signal is used to close the ~~RCIC steam supply, steam supply bypass, and cooling water supply valves~~ to prevent overflow into the main steam lines (MSLs). (The injection valve also closes due to the closure of the ~~steam supply~~ valve.)

Reactor Vessel Water Level—High, Level 8 signals for RCIC are initiated from two ~~level~~ transmitters from the narrow range water level measurement instrumentation, which sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel.

The Reactor Vessel Water Level—High, Level 8 Allowable Value is high enough to preclude isolating the injection valve of the RCIC during normal operation, yet low enough to trip the RCIC System prior to water overflowing into the MSLs.

Two channels of Reactor Vessel Water Level—High, Level 8 Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC initiation. Refer to LCO 3.5.3 for RCIC Applicability Bases.

3. Condensate Storage Tank Level—Low

Low level in the CST indicates the unavailability of an adequate supply of makeup water from this normal source. Normally the suction valve between the RCIC pump and the CST is open and, upon receiving a RCIC initiation signal, water for RCIC injection would be taken from the CST. However, if the water level in the CST falls below a preselected level, first the suppression pool suction valve automatically opens and then the CST suction valve automatically closes. This ensures that an adequate supply of makeup water is available to the RCIC pump. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valve must be open before the CST suction valve automatically closes.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3. Condensate Storage Tank Level—Low (continued) Switches 2

Two level ~~transmitters~~ are used to detect low water level in the CST. The Condensate Storage Tank Level—Low Function Allowable Value is set high enough to ensure adequate pump suction head while water is being taken from the CST.

Two channels of Condensate Storage Tank Level—Low Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC swap to suppression pool source. Refer to LCO 3.5.3 for RCIC Applicability Bases.

~~4. Suppression Pool Water Level—High~~

~~Excessively high suppression pool water level could result in the loads on the suppression pool exceeding design values should there be a blowdown of the reactor vessel pressure through the safety/relief valves. Therefore, signals indicating high suppression pool water level are used to transfer the suction source of RCIC from the CST to the suppression pool to eliminate the possibility of RCIC continuing to provide additional water from a source outside primary containment. This Function satisfies Criterion 3 of the NRC Policy Statement. To prevent losing suction to the pump, the suction valves are interlocked so that the suppression pool suction valve must be open before the CST suction valve automatically closes.~~ 4

~~Suppression pool water level signals are initiated from two level transmitters. The Allowable Value for the Suppression Pool Water Level—High Function is set low enough to ensure that RCIC will be aligned to take suction from the suppression pool before the water level reaches the point at which suppression design loads would be exceeded.~~

~~Two channels of Suppression Pool Water Level—High Function are available and are required to be OPERABLE when RCIC is required to be OPERABLE to ensure that no single instrument failure can preclude RCIC swap to suppression pool source. Refer to LCO 3.5.3 for RCIC Applicability Bases.~~

(continued)

BASES 4 4

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5. Manual Initiation

The Manual Initiation push button ~~switch~~ introduces a signal into the RCIC System initiation logic that is redundant to the automatic protective instrumentation and provides manual initiation capability. There is one push button for the RCIC System.

channel 2

2 Channel

The Manual Initiation Function is not assumed in any accident or transient analyses in the FSAR. However, the Function is retained for overall redundancy and diversity of the RCIC function as required by the NRC in the plant licensing basis.

4 2

There is no Allowable Value for this Function since the channel is mechanically actuated based solely on the position of the push button. One channel of Manual Initiation is required to be OPERABLE when RCIC is required to be OPERABLE.

2 Refer to LCO 3.5.3 for RCIC Applicability Bases

ACTIONS

~~Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the NRC staff Safety Evaluation Report (SER) for the topical report.~~ 5

A Note has been provided to modify the ACTIONS related to RCIC System instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RCIC System instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RCIC System instrumentation channel.

(continued)

BASES

ACTIONS (continued)

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.5.2-1 in the accompanying LCO. The applicable Condition referenced in the Table is Function dependent. Each time a channel is discovered to be inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

B.1 and B.2

2
parallel contacts

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic initiation capability for the RCIC System. In this case, automatic initiation capability is lost if two Function ~~N~~ channels in the same trip system are inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action B.2 is not appropriate, and the RCIC System must be declared inoperable within 1 hour after discovery of loss of RCIC initiation capability.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that the RCIC System cannot be automatically initiated due to two inoperable, untripped Reactor Vessel Water Level—Low Low, Level 2 channels in the same trip system. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

2
(parallel contacts)

1
credited

Because of the redundancy of sensors available to provide initiation signals and the fact that the RCIC System is not ~~assumed~~ in any accident or transient analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

tripped condition per Required Action B.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition E must be entered and its Required Action taken.

C.1

A risk based analysis was performed and determined that an allowable out of service time of 24 hours (Ref. 1) is acceptable to permit restoration of any inoperable channel to OPERABLE status (Required Action C.1). A Required Action (similar to Required Action B.1), limiting the allowable out of service time if a loss of automatic RCIC initiation capability exists, is not required. This Condition applies to the Reactor Vessel Water Level—High, Level 8 Function, whose logic is arranged such that any inoperable channel will result in a loss of automatic RCIC initiation capability. As stated above, this loss of automatic RCIC initiation capability was analyzed and determined to be acceptable. This Condition also applies to the Manual Initiation Function. Since this Function is not assumed in any accident or transient analysis, a total loss of manual initiation capability (Required Action C.1) for 24 hours is allowed. The Required Action does not allow placing a channel in trip since this action would not necessarily result in the safe state for the channel in all events.

2 (high water level trip)

D.1, D.2.1, and D.2.2

Required Action D.1 is intended to ensure that appropriate actions are taken if multiple inoperable, untripped channels within the same Function result in automatic component initiation capability being lost for the feature(s). For Required Action D.1, the RCIC System is the only associated feature. In this case, automatic component initiation capability is lost if two Function 3 channels ~~or two Function 4 channels~~ are inoperable and untripped. In this situation (loss of automatic suction swap), the 24 hour

2 (RCIC source swapover)

2

(continued)

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

allowance of Required Actions D.2.1 and D.2.2 is not appropriate, and the RCIC System must be declared inoperable within 1 hour from discovery of loss of RCIC initiation capability. As noted, Required Action D.1 is only applicable if the RCIC pump suction is not aligned to the suppression pool since, if aligned, the Function is already performed.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action D.1, the Completion Time only begins upon discovery that the RCIC System cannot be automatically aligned to the suppression pool due to two inoperable, untripped channels in the same Function. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide initiation signals and the fact that the RCIC System is not assumed in any accident or transient analysis, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 1) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action D.2.1, which performs the intended function of the channel (shifting the suction source to the suppression pool). Alternatively, Required Action D.2.2 allows the manual alignment of the RCIC suction to the suppression pool, which also performs the intended function. If Required Action D.2.1 or D.2.2 is performed, measures should be taken to ensure that the RCIC System piping remains filled with water. If it is not desired to perform Required Actions D.2.1 and D.2.2 (e.g., as in the case where shifting the suction source could drain down the RCIC suction piping), Condition E must be entered and its Required Action taken.

(continued)

BASES

ACTIONS (continued)

E.1

With any Required Action and associated Completion Time not met, the RCIC System may be incapable of performing the intended function, and the RCIC System must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

~~[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]~~ 5

As noted in the beginning of the SRs, the SRs for each RCIC System instrumentation Function are found in the SRs column of Table 3.3.5.2-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Functions 2 and ~~5~~ 4 4 and (b) for up 2 to 6 hours for Functions 1, 3, and ~~4~~ provided the associated Function maintains ~~trip~~ RCIC initiation 6 capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 1) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RCIC will initiate when necessary.

SR 3.3.5.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.2.1 (continued)

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 plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

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

1 — S

SR 3.3.5.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

~~SR 3.3.5.2.3~~

~~The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.5.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be re-adjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~ 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS

~~SR 3.3.5.2.3 (continued)~~ 4

~~The Frequency of 92 days is based on the reliability analysis of Reference 1.~~

SR 3.3.5.2.~~4~~ 3 4

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter with the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

24 4

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

SR 3.3.5.2.~~5~~ 4 4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.5.3 overlaps this Surveillance to provide complete testing of the safety function.

4 24

The ~~18~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the ~~18~~ month Frequency.

24 4

2

GENE -A

REFERENCES

1. ~~NEDE~~-770-06-2~~,~~ "Addendum to Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," ~~February 1991~~. December 1992 2

1. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

3. The proper 10 CFR 50.36(c)(2)(ii) criterion has been used. The current wording was developed prior to the issuance of the change to 10 CFR 50.36, which uses criterion 4 for the current words in the NUREG.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

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

6. Changes have been made to more closely reflect the Specification requirements.

B 3.3 INSTRUMENTATION

B 3.3.6.1 Primary Containment Isolation Instrumentation

All changes are [1] unless otherwise indicated

BASES

BACKGROUND

The primary containment isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves (PCIVs). The function of the PCIVs, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs). Primary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a DBA.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a primary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logic are (a) reactor vessel water level, (b) ambient area and differential temperatures, (c) main steam line (MSL) flow measurement, (d) Standby Liquid Control (SLC) System initiation, (e) condenser vacuum loss, (f) main steam line pressure, (g) reactor core isolation cooling (RCIC) ~~and RCIC/residual heat removal (RHR)~~ steam line flow and time delay relay, (h) reactor building ventilation exhaust plenum and fuel pool ventilation exhaust radiation, (i) RCIC steam line pressure, (j) RCIC turbine exhaust diaphragm pressure, (k) reactor water cleanup (RWCU) differential flow, (l) reactor ~~steam dome~~ vessel pressure, and (m) drywell pressure. Redundant sensor input signals are provided from each such isolation initiation parameter. ~~The only exception is SLC System initiation.~~ In addition, manual isolation of the logics is provided.

The primary containment isolation instrumentation has inputs to the trip logic from the isolation Functions listed below.

(continued)

BASES

All changes are [1] unless otherwise indicated

BACKGROUND (continued)

1. Main Steam Line Isolation

Any channel will trip the associated trip string. Only one trip string must trip to trip the associated trip system. The trip strings are arranged

One channel associated with each Function inputs to one of four trip strings. Two trip strings make up a trip system and both trip systems must actuate to cause isolation of all main steam isolation valves (MSIVs).

Most Main Steam Line Isolation Functions receive inputs from four channels. ~~The outputs from these channels are combined~~ in one-out-of-two taken twice logic to initiate isolation of all ~~main steam isolation valves (MSIVs)~~. The outputs from the same channels are arranged into two two-out-of-two ~~logic~~ trip systems to isolate all MSL drain valves. ~~Each MSL drain line has two isolation valves with~~ one two-out-of-two ~~logic~~ trip system ~~associated~~ is associated with the inboard valve and the other two-out-of two trip system is associated with the outboard valves. One exception to this arrangement is the Main Steam Line Flow—High Function. This Function uses 16 flow channels, four for each steam line. One channel from each steam line inputs to one of four trip strings. Two trip strings make up each trip system, and both trip systems must trip to cause an MSL isolation. Each trip string has four inputs (one per MSL), any one of which will trip the trip string. The trip strings ~~within a trip system~~ are arranged in a one-out-of-two taken twice logic. Therefore, this is effectively a one-out-of-eight taken twice logic arrangement to initiate isolation of the MSIVs. Similarly, the 16 flow channels are connected into two two-out-of-two ~~logic~~ trip systems (effectively, two one-out-of-four twice logic), with ~~each~~ one trip system isolating ~~one of~~ the ~~two~~ inboard MSL drain valves.

Insert BKGD-1

2. Primary Containment Isolation

~~Each~~ Most Primary Containment Isolation Function(s) receive~~s~~ inputs from four channels. The outputs from these channels are arranged into two two-out-of-two ~~logic~~ trip systems. One trip system initiates isolation of all automatic inboard PCIVs, while the other trip system initiates isolation of all automatic outboard PCIVs. Each trip system ~~logic~~ closes one of the two valves on each penetration with automatic isolation so that operation of either trip system isolates the penetration.

INSERT BKGD-2

3. Reactor Core Isolation Cooling System Isolation

Most Functions receive input from two channels, with each channel in one trip system using one-out-of-one logic. ~~Functions 3.j and 3.k (RHR Equipment Room Temperature) have one channel in each trip system in each room for a total of four channels per Function, but the logic is the same~~ [5]

(continued)

Insert BKGD-1

The other exception to this arrangement is the Manual Initiation Function. The MSIV manual isolation logic is similar to the other MSIV isolation logic in that each trip string is associated with a manual isolation pushbutton in a one-out-of-two taken twice logic as described above. However, the MSL drain isolation valves are isolated by a single manual isolation pushbutton; the outboard MSL drain isolation valves isolate from the B channel manual isolation pushbutton and the inboard MSL drain valve isolates from the D channel manual isolation pushbutton. The A and C channel manual isolation pushbuttons only directly affect the manual isolation of the MSIVs. The same channel B and D manual isolation pushbuttons are used for the logic of other Group isolation valves.

MSL Isolation Functions isolate the Group 1 valves.

Insert BKGD-2

An exception to this arrangement are the Traversing In-core Probe (TIP) System valve/drives. For these valves and drive mechanisms, only one trip system (the inboard valve system) is provided. When the trip system actuates, the drive mechanisms withdraw the TIPs and, when the TIPs are fully withdrawn, the ball valves close. This exception to the arrangement, which has been previously approved by the NRC as part of the issuance of the Operating Licenses, is described in UFSAR Table 6.2-21 (Ref. 1).

Reactor Vessel Water Level—Low, Level 3 isolates the Group 7 valves. Reactor Vessel Water Level—Low Low, Level 2 isolates the Group 2, 3, and 4 valves. Reactor Vessel Water Level—Low Low Low, Level 1 isolates the Group 10 valves. Drywell Pressure—High isolates the Group 2, 4, 7, and 10 valves. Reactor Building Ventilation Exhaust Plenum Radiation—High isolates the Group 4 valves. Fuel Pool Ventilation Exhaust Radiation—High isolates the Group 4 valves. Manual Initiation Functions isolate the Group 2, 4, 7, and 10 valves.

All changes are 1 unless otherwise indicated

BASES

BACKGROUND

5

3. Reactor Core Isolation Cooling System Isolation (continued)

steam | one | and the other trip system is connected to the outboard steam valve | the inboard

~~one-out-of-one~~. ~~Each~~ of the two trip systems is connected to ~~one of the two~~ valves on ~~each~~ RCIC penetration so that operation of either trip system isolates the penetration. ~~The~~ exception~~s~~ to this arrangement ~~is~~ the RCIC Turbine Exhaust Diaphragm Pressure—High Function~~s~~. Th~~is~~ Function~~s~~ receive~~s~~ input from four turbine exhaust diaphragm pressure channels. The outputs from the ~~turbine exhaust diaphragm pressure~~ channels are connected into two two-out-of-two trip systems, each trip system isolating ~~one of~~ the ~~two~~ RCIC valves.

the | Two | are | RCIC Steam Supply Pressure—Low and | ese | se | steam supply pressure channels and four | steam | inboard or outboard | , respectively | Insert BKGD-3

4. Reactor Water Cleanup System Isolation

4.c, 4.d

Most Functions receive input from two channels with each channel in one trip system using one-out-of-one logic. Functions 4.e and 4.f ~~(RWCU Pump Room Temperature)~~ have one channel in each trip system in each ~~room~~ for a total of four channels per Function, but the logic is the same (one-out-of-one). Each of the two trip systems is connected to one of the two valves on ~~each~~ RWCU penetration so that operation of either trip system isolates the penetration. The exception~~s~~ to this arrangement ~~is~~ the Reactor Vessel Water Level—Low Low, Level 2 Function. ~~This Function~~ receives input from four reactor vessel water level channels. The outputs from the reactor vessel water level channels are connected into two two-out-of-two trip systems, each trip system isolating one of the two RWCU valves.

for Functions 4.c and 4.d and a total of six channels per Function for Functions 4.e and 4.f, | area | per area | the | are | and the SLC System Initiation | s | The Reactor Vessel Water Level—Low Low, Level 2 Function | Insert BKGD-4

RWCU Heat Exchanger Area Temperature—High, RWCU Heat Exchanger Area Ventilation Differential Temperature—High, RWCU Pump and Valve Area Temperature—High, and RWCU Pump and Valve Area Ventilation Differential Temperature—High, respectively

5. RHR Shutdown Cooling System Isolation

Vessel | Manual Initiation

The Shutdown Cooling Isolation Function receives input signals from instrumentation for the Reactor Vessel Water Level—Low, Level 3, ~~Drywell Pressure—High,~~ Reactor ~~Steam Dome~~ Pressure—High, ~~and RHR Equipment Room Ambient~~ and ~~Differential Temperature—High~~ Functions. The Reactor Vessel Water Level—Low ~~Reactor Steam Dome Pressure—High and Drywell Pressure—High~~ Function~~s each have~~ four channels. The outputs from the reactor vessel water level ~~and drywell pressure~~ channels are connected into two two-out-of-two trip systems. The reactor ~~steam dome~~ pressure is arranged into two one-out-of-~~two~~ trip systems.

receives input from | —Low | Vessel | one | —High Function | while the Reactor Vessel Pressure—High Function receives input from two channels | Insert BKGD-5

(continued)

Insert BKGD-3

In addition, the RCIC System Isolation Manual Initiation Function has only one channel, which isolates the outboard RCIC steam valve only (provided an automatic initiation signal is present). One additional exception involves the Drywell Pressure—High Function and the RCIC Steam Supply Pressure—Low Functions. The Drywell Pressure—High Function does not provide an isolation to the inboard and outboard RCIC steam valves (Group 8 valves). The logic is arranged such that RCIC Steam Supply Pressure—Low coincident with Drywell Pressure—High isolates the Group 9 valves. The Drywell Pressure—High Function receives inputs from four drywell pressure channels. The outputs from these channels are connected into two one-out-of-two trip systems with coincident RCIC Steam Supply Pressure also connected into the same trip systems arranged in a similar manner (one-out-of-two). One of the two trip systems is connected to the inboard RCIC turbine exhaust vacuum breaker line isolation valve and the other trip system is connected to the outboard RCIC turbine exhaust vacuum breaker line isolation valve (Group 9 valves).

RCIC System Isolation Functions isolate the Group 8 and 9 valves.

Insert BKGD-4

The Standby Liquid Control (SLC) System initiation has two channels, one from each SLC pump start circuit, in a single trip system. The two channels are connected in a one-out-of-two logic. This trip system isolates the RWCU inlet outboard valve.

RWCU Isolation Functions isolate the Group 5 valves.

Insert BKGD-5

The Manual Initiation Function uses two channels, one for each trip system.

All changes are [1] unless otherwise [illegible]

associated with the reactor vessel head spray injection penetration, the shutdown cooling return penetration, and the shutdown cooling suction penetration while the other trip system is connected to the inboard

BASES

BACKGROUND 5. Shutdown Cooling System Isolation (continued)

~~The RHR Equipment Room Ambient and Differential Temperature Functions receive input from four channels with each channel in one trip system in one room using one-out-of-one logic.~~ ~~Each~~ One of the two trip systems is connected to ~~one of~~ the ~~two~~ outboard valve ~~valves on each~~ suction shutdown cooling penetration and the shutdown cooling return check valve bypasses ~~so that operation of either trip system isolates the penetration~~. The RHR Shutdown Cooling Isolation Functions isolate the Group 6 valves

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The isolation signals generated by the primary containment isolation instrumentation are implicitly assumed in the safety analyses of References 1 and 2 to initiate closure of valves to limit offsite doses. Refer to LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Applicable Safety Analyses Bases, for more detail.

Primary containment isolation instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii) [6]. Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the primary containment instrumentation is dependent on the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.6.1-1. Each Function must have a required number of OPERABLE channels, with their setpoints within the specified Allowable Values, where appropriate. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. [2] The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. Each channel must also respond within its assumed response time, where appropriate.

Allowable Values are specified for each Primary Containment Isolation Function specified in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

Insert ASA
1

Certain Emergency Core Cooling Systems (ECCS) and RCIC valves (e.g., minimum flow) also serve the dual function of automatic PCIVs. The signals that isolate these valves are also associated with the automatic initiation of the ECCS and RCIC. Some ~~The~~ instrumentation and ACTIONS associated with these signals are addressed in LCO 3.3.5.1, "ECCS Instrumentation," and LCO 3.3.5.2, "RCIC System Instrumentation," and are not included in this LCO.

1 3

In general, the individual Functions are required to be OPERABLE in MODES 1, 2, and 3 consistent with the Applicability for LCO 3.6.1.1, "Primary Containment." Functions that have different Applicabilities are discussed below in the individual Functions discussion.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Main Steam Line Isolation

1.a. Reactor Vessel Water Level—Low Low Low, Level 1

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of the MSIVs and other interfaces with the reactor vessel occurs to prevent offsite dose limits from being exceeded. The Reactor Vessel Water Level—Low Low Low, Level 1 Function is one of the many Functions

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Reactor Vessel Water Level—Low Low Low, Level 1 (continued)

assumed to be OPERABLE and capable of providing isolation signals. The Reactor Vessel Water Level—Low Low Low, Level 1 Function associated with isolation is assumed in the analysis of the recirculation line break (Ref. 2). The isolation of the MSL on Level 1 supports actions to ensure that offsite dose limits are not exceeded for a DBA.

2
1

differential pressure
1

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low Low, Level 1 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is chosen to be the same as the ECCS Level 1 Allowable Value (LCO 3.3.5.1) to ensure that the MSLs isolate on a potential loss of coolant accident (LOCA) to prevent offsite doses from exceeding 10 CFR 100 limits.

This Function isolates the Group 1 ~~and 5~~ valves.

1

1.b. Main Steam Line Pressure—Low

Low MSL pressure indicates that there may be a problem with the turbine pressure regulation, which could result in a low reactor vessel water level condition and the RPV cooling down more than 100°F/hour if the pressure loss is allowed to continue. The Main Steam Line Pressure—Low Function is directly assumed in the analysis of the pressure regulator ~~failure~~ (Ref. 2). For this event, the closure of the MSIVs ensures that the RPV temperature change limit (100°F/hour) is not reached. In addition, this Function supports actions to ensure that Safety Limit 2.1.1.1 is not exceeded. (This Function closes the MSIVs prior to pressure decreasing below 785 psig, which results in a scram due to MSIV closure, thus reducing reactor power to ≤ 25% RTP.)

1
4
event

1 downstream of
prior to each main turbine stop valve
1

The MSL low pressure signals are initiated from four ~~transmitters~~ that are connected to the MSL header. The ~~transmitters~~ are arranged such that, even though physically

pressure switches
1

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b. Main Steam Line Pressure—Low (continued) [1]

switch

separated from each other, each ~~transmitter~~ is able to detect low MSL pressure. Four channels of Main Steam Line Pressure—Low Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value was selected to be high enough to prevent excessive RPV depressurization.

The Main Steam Line Pressure—Low Function is only required to be OPERABLE in MODE 1 since this is when the assumed transient can occur (Ref. ~~2~~). 4 [1]

This Function isolates the Group 1 valves.

1.c. Main Steam Line Flow—High

Main Steam Line Flow—High is provided to detect a break of the MSL and to initiate closure of the MSIVs. If the steam were allowed to continue flowing out of the break, the reactor would depressurize and the core could uncover. If the RPV water level decreases too far, fuel damage could occur. Therefore, the isolation is initiated on high flow to prevent or minimize core damage. The Main Steam Line Flow—High Function is directly assumed in the analysis of [3] the main steam line break (MSLB) accident (Ref. ~~2~~). 5 [1] The isolation action, along with the scram function of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46 and offsite doses do not exceed the 10 CFR 100 limits.

differential pressure switches [1]

The MSL flow signals are initiated from 16 ~~transmitters~~ that are connected to the four MSLs. (the differential pressure switches sense differential pressure across a flow element) [1] The ~~transmitters~~ switches are arranged such that, even though physically separated from each other, all four connected to one steam line would be able to detect the high flow. Four channels of Main Steam Line Flow—High Function for each ~~unisolated~~ [4] MSL (two channels per trip system) are available and are required to be OPERABLE so that no single instrument failure will preclude detecting a break in any individual MSL.

The Allowable Value is chosen to ensure that offsite dose limits are not exceeded due to the break.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.c. Main Steam Line Flow—High (continued)

This Function isolates the Group 1 valves.

1.d. Condenser Vacuum—Low

(Ref. 6) 1 (Ref. 7)

The Condenser Vacuum—Low Function is provided to prevent overpressurization of the main condenser in the event of a loss of the main condenser vacuum. Since the integrity of the condenser is an assumption in offsite dose calculations, the Condenser Vacuum—Low Function is assumed to be OPERABLE and capable of initiating closure of the MSIVs. The closure of the MSIVs is initiated to prevent the addition of steam that would lead to additional condenser pressurization and possible rupture of the diaphragm installed to protect the turbine exhaust hood, thereby preventing a potential radiation leakage path following an accident.

switches 1

Condenser vacuum pressure signals are derived from four pressure ~~transmitters~~ that sense the pressure in the condenser. Four channels of Condenser Vacuum—Low Function are available and are required to be OPERABLE to ensure no single instrument failure can preclude the isolation function.

The Allowable Value is chosen to prevent damage to the condenser due to pressurization, thereby ensuring its integrity for offsite dose analysis. As noted (footnote (a) to Table 3.3.6.1-1), the channels are not required to be OPERABLE in MODES 2 and 3, when all turbine stop valves (TSVs) are closed, since the potential for condenser overpressurization is minimized. Switches are provided to manually bypass the channels when all TSVs are closed.

This Function isolates the Group 1 valves.

Line 5

1.e ~~1.f~~. Main Steam ~~Tunnel~~ ~~Ambient and~~ Differential Temperature—High

a main steam line 5

~~Ambient and~~ Differential Temperature—High is provided to detect a leak in ~~the RCPB~~, and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. However, credit for these instruments is not taken in any transient or accident analysis in the u FSAR, since

1

(continued)

All changes are [1] unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.e ~~1.3~~. Main Steam Line Tunnel ~~Ambient and~~ Differential Temperature—High (continued) [5]

bounding analyses are performed for large breaks such as MSLBs.

~~Ambient temperature signals are initiated from thermocouples located in the area being monitored. Four channels of Main Steam Tunnel Temperature—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. Each Function has one temperature element.~~ [5]

Eight thermocouples provide input to the Main Steam Line Tunnel Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the ~~area cooling system~~ main steam line tunnel for a total of four available channels. Four channels of Main Steam Line Tunnel Differential Temperature - High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function

The ~~ambient and~~ differential temperature monitoring Allowable Value is chosen to detect a leak equivalent to ~~25~~ 100 [1] gpm.

These Functions isolate the Group 1 valves.

1.~~6~~ f. Manual Initiation [5]

The Manual Initiation push button channels introduce signals into the MSL isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific (U)FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis. [2] Insert from next page

There are four push buttons for the logic, with two manual initiation push buttons per trip system. START NEW ¶ There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons. [2]

This Function isolates the Group 1 valves.

(continued)

move to previous page 2

BASES

f 5

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.a. Manual Initiation (continued)

Four channels of Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3, since these are the MODES in which the MSL Isolation automatic Functions are required to be OPERABLE.

2. Primary Containment Isolation

2.a, 2.e. Reactor Vessel Water Level—Low Low, Level 2 5

Low RPV water level indicates the capability to cool the fuel may be threatened. The valves whose penetrations communicate with the primary containment are isolated to limit the release of fission products. The isolation of the primary containment on Level 2 supports actions to ensure that offsite dose limits of 10 CFR 100 are not exceeded. The Reactor Vessel Water Level—Low Low, Level 2 Function associated with isolation is implicitly assumed in the U FSAR analysis as these leakage paths are assumed to be isolated post LOCA. 1

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from level differential pressure 1 transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE to ensure no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since isolation of these valves is not critical to orderly plant shutdown. 1

This Function isolates the Group 6A, 6B, and 7 2, 3, and 4 valves.

2.b, 2.d, 2.f. Drywell Pressure—High 5

High drywell pressure can indicate a break in the RCPB inside the drywell 1. The isolation of some of the PCIVs on high drywell pressure supports actions to ensure that offsite dose limits of

(continued)

BASES

5

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.b, ~~2.d, 2.f~~ Drywell Pressure—High (continued)

10 CFR 100 are not exceeded. The Drywell Pressure—High Function associated with isolation of the primary containment is implicitly assumed in the u FSAR accident analysis as these leakage paths are assumed to be isolated post LOCA. 1

High drywell pressure signals are initiated from pressure Switches ~~transmitters~~ that sense the pressure in the drywell. Four channels of Drywell Pressure—High ~~per~~ Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. 1

1

The Allowable Value was selected to be the same as the RPS ~~ECCS~~ Drywell Pressure—High Allowable Value (LCO 3.3.1.1), since this may be indicative of a LOCA inside primary containment.

Insert from page B 3.3-152 and B 3.3.153 5

These is Function~~s~~ isolates the Group ~~6A and 7~~ 2, 4, 7, and 10 valves ~~(Function 2.b), E61 isolation valves (Function 2.d), and Group 6B valves (Function 2.f)~~. 1

Insert Function 2.d 5

2.e. Reactor Vessel Water Level—Low Low Low, Level 1 5

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of the primary containment occurs to prevent offsite dose limits from being exceeded. The Reactor Vessel Water Level—Low Low Low, Level 1 Function is one of the many Functions assumed to be OPERABLE and capable of providing isolation signals. The Reactor Vessel Water Level—Low Low Low, Level 1 Function associated with isolation is implicitly ~~assumed in the~~ u FSAR analysis as these leakage paths are assumed to be isolated post LOCA. 1

Reactor vessel water level signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low Low, Level 1 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

(continued)

Insert Function 2.d

2.d. Fuel Pool Ventilation Exhaust Radiation—High

High fuel pool ventilation exhaust radiation indicates increased airborne radioactivity levels in secondary containment refuel floor area which could be due to fission gases from the fuel pool resulting from a refueling accident. Since the primary and secondary containments may be in communication, the vent and purge valves for primary containment isolation are also provided with this signal. Fuel Pool Ventilation Exhaust Radiation—High Function initiates an isolation to assure timely closure of valves to protect against substantial releases of radioactive materials to the environment. While this Function is identified as initiating the Standby Gas Treatment System for a spent fuel cask drop accident (Ref. 3), it is not assumed in any limiting accident or transient analysis in the UFSAR because other leakage paths (e.g., MSIVs) are more limiting.

The fuel pool ventilation exhaust radiation signals are initiated from radiation detectors located in the reactor building exhaust ducting coming from the refuel floor. The signal from each detector is input to an individual monitor whose trip output is assigned to an isolation channel. Four channels of Fuel Pool Ventilation Exhaust Radiation—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value is chosen to be the same as the Fuel Pool Ventilation Exhaust Radiation—High Function (LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation") to provide a conservative isolation of this potential release path during this abnormal condition of increased airborne radioactivity.

This Function isolates the Group 4 valves.

All changes are 1 unless otherwise indicated

BASES 5—e

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.c. Reactor Vessel Water Level—Low Low Low, Level 1 (continued)

The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is chosen to be the same as the ECCS Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value (LCO 3.3.5.1) to ensure the valves are isolated to prevent offsite doses from exceeding 10 CFR 100 limits.

This Function isolates the ~~E61 isolation~~ valves. Group 10

Reactor Building 5 c

2.d. ~~Containment and Drywell~~ Ventilation Exhaust Radiation—High Plenum 5

High ventilation exhaust radiation is an indication of possible gross failure of the fuel cladding. The release may have originated from the primary containment due to a break in the RCPB or refueling floor due to a fuel handling accident. When Reactor Building Ventilation Exhaust Radiation—High is detected, valves whose penetrations communicate with the primary containment atmosphere are isolated to limit the release of fission products. ~~Additionally, the Ventilation Exhaust Radiation—High is assumed to initiate isolation of the primary containment during a fuel handling accident (Ref. 2).~~

The Reactor Building Ventilation Exhaust Plenum Radiation—High signals are initiated from radiation detectors that are located ~~on~~ in the ventilation ~~exhaust piping coming from the drywell and containment~~ reactor building return air riser above the upper area of the steam tunnel prior to the reactor building ventilation isolation dampers. The signal from each detector is input to an individual monitor whose trip outputs are assigned to an isolation channel. Four channels of ~~Containment and Drywell~~ Reactor Building Ventilation Exhaust Plenum Radiation—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Values are chosen to promptly detect gross failure of the fuel cladding and to ensure offsite doses remain below 10 CFR 20 and 10 CFR 100 limits.

~~The Function is required to be OPERABLE during CORE ALTERATIONS, operations with a potential for draining the reactor vessel (OPDRVs), and movement of irradiated fuel assemblies in the primary or secondary containment because the capability of detecting radiation releases due to fuel failures (due to fuel uncovery or dropped fuel assemblies)~~ 5

(continued)

move to page B 3.3-151 as indicated 5

All changes are 1 unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

Reactor Building

c

2.~~d~~. ~~Containment and~~ Drywell Ventilation Exhaust Radiation—High (continued) Plenum 5

~~must be provided to ensure offsite dose limits are not exceeded.~~

4 1

These Functions isolate the Group ~~0~~ valves.

move to page B 3.3-151 as indicated 5

Insert Function 2.f 5

2.~~h~~ 9 Manual Initiation 5

The Manual Initiation push button channels introduce signals into the primary containment isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific (U)FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis.

There are ~~four~~ two push buttons for the logic, ~~two~~ one manual initiation push button~~s~~ per trip system. ~~There is no Allowable Value for this Function since~~ the channels are mechanically actuated based solely on the position of the push buttons. 2

~~Four~~ Two channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3, since these are the MODES in which the Primary Containment Isolation automatic Functions are required to be OPERABLE. 2

This Function isolates the Group 2, 4, 7 and 10 valves.

3. Reactor Core Isolation Cooling System Isolation

3.a. RCIC Steam Line Flow—High

RCIC Steam Line Flow—High Function is provided to detect a break of the RCIC steam lines and initiates closure of the steam line isolation valves. If the steam is allowed to continue flowing out of the break, the reactor will depressurize and core uncovery can occur. Therefore, the isolation is initiated on high flow to prevent or minimize core damage. The isolation action, along with the scram function of the Reactor Protection System (RPS), ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. Specific credit for this Function

(continued)

Insert Function 2.f

2.f. Reactor Vessel Water Level—Low, Level 3

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, the valves whose penetrations communicate with the primary containment are isolated to limit the release of fission products. The isolation of the primary containment on Level 3 supports actions to ensure that offsite dose limits of 10 CFR 100 are not exceeded. The Reactor Vessel Water Level—Low, Level 3 Function associated with isolation is implicitly assumed in the UFSAR analysis as these leakage paths are assumed to be isolated post LOCA.

Reactor Vessel Water Level—Low, Level 3 signals are initiated from differential pressure transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of the Reactor Vessel Water Level—Low, Level 3 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low, Level 3 Allowable Value was chosen to be the same as the RPS Reactor Vessel Water Level—Low, Level 3 Allowable Value (LCO 3.3.1.1) since the capability to cool the fuel may be threatened.

This Function isolates the Group 7 valves.

All changes are [II] unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.a. RCIC Steam Line Flow—High (continued)

is not assumed in any FSAR accident analyses since the bounding analysis is performed for large breaks such as recirculation and MSL breaks. However, these instruments prevent the RCIC steam line break from becoming bounding.

The RCIC Steam Line Flow—High signals are initiated from two ~~transmitters~~ differential pressure switches that are connected to the system steam lines. Two channels of RCIC Steam Line Flow—High Functions are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value is chosen to be low enough to ensure that the trip occurs to prevent fuel damage and maintains the MSLB event as the bounding event.

This Function isolates the Group ~~9~~ B valves.

3.b. RCIC Steam Line Flow ~~Time Delay~~ — Timer 5

The RCIC Steam Line Flow ~~Time Delay~~ — Timer is provided to prevent false isolations on RCIC Steam Line Flow—High during system startup transients and therefore improves system reliability. This Function is not assumed in any FSAR transient or accident analyses. since the bounding analysis is performed for large breaks such as recirculation and MSL breaks. However, these instruments prevent the RCIC steam line break from being bounding.

2

~~The Allowable Value was chosen to be long enough to prevent false isolations due to system starts but not so long as to impact offsite dose calculations.~~

Insert 3.b

Two channels ~~for~~ of RCIC Steam Line Flow ~~Time Delay~~ — Timer Functions are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

This Function isolates the Group B valves.

5

3.c. RCIC Steam Supply ~~Line~~ Pressure—Low RCIC Steam supply

Low ~~MSL~~ RCIC Steam supply pressure indicates that the pressure of the steam in the RCIC turbine may be too low to continue operation of the ~~associated system's~~ RCIC turbine. This isolation is for equipment protection and is not assumed in any transient or accident analysis in the FSAR. However, it also provides a diverse signal to indicate a possible system break. These instruments are included in the Technical Specifications [2]

(continued)

Insert 3.b

The RCIC Steam Line Flow—Timer Function delays the RCIC Steam Line Flow—High signals by use of time delay relays. When an RCIC Steam Line Flow—High signal is generated, the time delay relays delay the tripping of the associated RCIC isolation trip system for a short time.

BASES

All changes are [1] unless otherwise indicated

[6]

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.c. RCIC Steam Supply ~~Line~~ Pressure—Low (continued) [5]

(TS) because of the potential for risk due to possible failure of the instruments preventing RCIC initiations. Therefore they meet Criterion 4 of 10 CFR 50.36(c)(2)(ii).

The RCIC Steam Supply ~~Line~~ pressure Pressure—Low signals are initiated from ~~two~~ four ~~transmitters~~ switches that are connected to the ~~system~~ RCIC steam line. ~~Two~~ Four channels of RCIC Steam Supply ~~Line~~ Pressure—Low Function~~s~~ are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value is selected to be high enough to prevent damage to the ~~system's~~ RCIC turbine~~s~~. [2]

This Function isolates the Group ~~4~~ 8 valves. This Function, coincident with Drywell Pressure-High, also isolates the Group 9 valves.

3.d. RCIC Turbine Exhaust Diaphragm Pressure—High

[2]

High turbine exhaust diaphragm pressure indicates that the pressure may be too high to continue operation of the ~~associated system's~~ RCIC turbine. That is, one of two exhaust diaphragms has ruptured and pressure is reaching turbine casing pressure limits. This isolation is for equipment protection and is not assumed in any transient or accident analysis in the ~~F~~USAR. These instruments are included in the TS because of the potential for risk due to possible failure of the instruments preventing RCIC initiations ~~(Ref. 3)~~. Therefore, they meet Criterion 4 of 10 CFR 50.36 (c)(2)(ii). [6]

The RCIC Turbine Exhaust Diaphragm Pressure—High signals are initiated from four pressure ~~transmitters~~ switches that are connected to the area between the rupture diaphragms on ~~each system's~~ the RCIC turbine exhaust line. Four channels of RCIC Turbine Exhaust Diaphragm Pressure—High Functions are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value~~s are high~~ is selected to be low enough to prevent damage to the ~~system's~~ RCIC turbine~~s~~.

This Function isolates the Group ~~4~~ 8 valves.

(continued)

All changes are [1] unless otherwise indicated

BASES

3.g, 3.h

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

3.e, 3.f, ~~3.j, 3.k~~. ~~Ambient~~ and Differential Temperature—High [5]

Area

~~Ambient~~ and Differential Temperatures are provided to detect a leak from the ~~associated system~~ steam piping. The isolation occurs when a very small leak has occurred and is diverse to the high flow instrumentation. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. These Functions are not assumed in ~~any~~ FSAR transient or accident analysis, since bounding analyses are performed for large breaks such as recirculation or MSL breaks.

RCIC [2]

u

Area ~~Ambient~~ ~~and Differential~~ Temperature—High signals are initiated from thermocouples that are ~~appropriately~~ located In the area ~~to protect the system~~ that is being monitored. Two instruments monitor each area. ~~Six~~ Four channels for ~~RHR and~~ Area ~~RCIC/Ambient~~ Temperature—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. There are two for the RCIC equipment room and ~~four~~ two for the ~~RHR~~ RCIC steam line tunnel area.

8

RCIC steam line tunnel

There are ~~12~~ thermocouples (four for the RCIC room and ~~eight~~ four for the ~~RHR~~ area) that provide input to the ~~Area Ventilation~~ Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of ~~six~~ four (two for the RCIC equipment room and ~~four~~ two for the ~~RHR~~ RCIC steam line tunnel area) available channels.

The Allowable Values are set low enough to detect a leak equivalent to 25 gpm.

8

This Function isolates the Group ~~6~~ valves.

~~3.g, 3.h. Main Steam Line Tunnel Ambient and Differential Temperature—High~~ [5]

~~Ambient and Differential Temperature—High is provided to detect a leak in the RCPB and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred. If the small leak is allowed to continue without isolation, offsite limits may be reached. However, credit for these instruments is not taken in any~~

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.g, 3.h. Main Steam Line Tunnel Ambient and Differential Temperature—High (continued)

transient or accident analysis in the FSAR, since bounding analyses are performed for large breaks such as MSLBs.

Ambient temperature signals are initiated from thermocouples located in the area being monitored. Two channels of Main Steam Tunnel Temperature—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. Each Function has one temperature element.

Four thermocouples provide input to the Main Steam Tunnel Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of two available channels.

The Allowable Values are chosen to detect a leak equivalent to 25 gpm.

This Function isolates the Group 4 valves.

3.i. Main Steam Line Tunnel Temperature Timer

The Main Steam Line Tunnel Temperature Timer is provided to allow all the other systems that may be leaking in the main steam tunnel (as indicated by the high temperature) to be isolated before RCIC is automatically isolated. This ensures maximum RCIC System operation by preventing isolations due to leaks in other systems. This Function is not assumed in any FSAR transient or accident analysis; however, maximizing RCIC availability is an important function.

Two channels for RCIC Main Steam Line Tunnel Timer Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Values are based on maximizing the availability of the RCIC System; that is, providing

15

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.i. Main Steam Line Tunnel Temperature Timer (continued)

sufficient time to isolate all other potential leakage sources in the main steam tunnel before RCIC is isolated. 5

This Function isolates the Group 4 valves.

3.l. RCIC/RHR High Steam Line Flow—High

RCIC/RHR high steam line flow is provided to detect a break of the common steam line of RCIC and RHR (steam condensing mode) and initiates closure of the isolation valves for both systems. If the steam were allowed to continue flowing out of the break, the reactor would depressurize and the core could uncover. Therefore, the isolation is initiated at high flow to prevent or minimize core damage. Specific credit for this Function is not assumed in any FSAR accident or transient analysis since the bounding analysis is performed for large breaks such as recirculation and MSL breaks. However, these instruments prevent the RCIC/RHR steam line break from becoming bounding. 5

The RCIC/RHR steam line flow signals are initiated from two transmitters that are connected to the steam line. Two channels with one channel in each trip system are available and required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. The Allowable Value is selected to ensure that the trip occurs to prevent fuel damage and maintains the MSLB as the boundary event.

This Function actuates the Group 4 valves.

5 i

3.m. Drywell Pressure—High

High drywell pressure can indicate a break in the RCPB. The RCIC isolation of the turbine exhaust is provided to prevent communication with the drywell when high drywell pressure exists. A potential leakage path exists via the turbine exhaust. The isolation is delayed until the system becomes unavailable for injection (i.e., low steam line pressure). The isolation of the RCIC turbine exhaust by Drywell Pressure—High is indirectly assumed in the FSAR accident analysis because the turbine exhaust leakage path is not assumed to contribute to offsite doses. u 1

(continued)

5 i

All changes are 1 unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3.d. Drywell Pressure—High (continued)

High drywell pressure signals are initiated from pressure ~~transmitters~~ switches that sense the pressure in the drywell. ~~Two~~ Four channels of RCIC Drywell Pressure—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value was selected to be the same as the ECCS Drywell Pressure—High Allowable Value (LCO 3.3.5.1), since this is indicative of a LOCA inside primary containment.

This Function, coincident with RCIC Steam Supply Pressure-Low, isolates the Group 9 valves.

j

3.n. Manual Initiation 5

The Manual Initiation push button channel~~s~~ introduce~~s~~ a signal~~s~~ into the RCIC System isolation logic that ~~are~~ is redundant to the automatic protective instrumentation and provide~~s~~ a manual isolation capability when a system initiation signal is present. There is no specific FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis.

15 s a

There ~~are four~~ is one push button~~s~~ for RCIC~~, two manual initiation push buttons per trip system~~. There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

5

~~Four~~ One channel~~s~~ of ~~RCIC~~ Manual Initiation Function ~~are~~ is available and ~~are~~ is required to be OPERABLE.

Insert 3.1

2

This Function, coincident with a Reactor Vessel Water Level-Low Low, Level 2, isolates the outboard Group 8 valve,

4. Reactor Water Cleanup System Isolation

4.a. Differential Flow—High

The high differential flow signal is provided to detect a break in the RWCU System. This will detect leaks in the RWCU System when area or differential temperature would not provide detection (i.e., a cold leg break). Should the reactor coolant continue to flow out of the break, offsite dose limits may be exceeded. Therefore, isolation of the RWCU System is initiated when high differential flow is

(continued)

Insert 3.j

in MODES 1, 2, and 3 since these are the MODES in which the RCIC System Isolation automatic Functions are required to be OPERABLE. As noted (footnote (b) to Table 3.3.6.1-1), this Function only provides input into one of the two trip systems.

All changes are [1] unless otherwise Indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4.a. Differential Flow—High (continued) (Function 4.b, described below)

sensed to prevent exceeding offsite doses. A time delay is provided to prevent spurious trips during most RWCU operational transients. This Function is not assumed in any (U) FSAR transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

The high differential flow signals are initiated from ~~two~~ one differential pressure transmitter~~s~~ ~~that are connected to the inlet (from the reactor vessel) and four transmitters from the outlets (to condenser and feedwater) of the RWCU System.~~ monitoring inlet flow (from the reactor vessel) and two transmitters monitoring system outlet flow to the two available flowpaths (normal return to feedwater and discharge flow to either the main condenser or radwaste). Control rod drive seal injection flow to the RWCU pump seals is also accounted for in the differential flow setpoint. The outputs of the transmitters are compared (in ~~two different~~ a summer~~s~~) and the outputs are sent to two ~~high flow~~ alarm trip units. If the difference between the inlet and outlet flow is too large, each alarm trip unit generates an isolation signal. Two channels of Differential Flow—High Function are available and are required to be OPERABLE to ensure that no single instrument failure (other than the common transmitters and summers) can preclude the isolation function.

The ~~Reactor Water Cleanup~~ Differential Flow—High Allowable Value ensures that the break of the RWCU piping is detected.

This Function isolates the Group ~~8~~ 5 valves.

4.b. Differential Flow—Timer

The Differential Flow—Timer is provided to avoid RWCU System isolations due to operational transients (such as pump starts and mode changes). During these transients the inlet and return flows become unbalanced for short time periods and Differential Flow—High will be sensed without an RWCU System break being present. Credit for this Function is not assumed in the (u) FSAR accident or transient analysis, since bounding analyses are performed for large breaks such as MSLBs.

[2] The Differential Flow—Timer Allowable Value is selected to ensure that the MSLB outside containment remains the limiting break for (u) FSAR analysis for offsite dose calculations.

Insert 4.b

Two channels for Differential Flow—Timer Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

This Function isolates the Group 5 valves.

(continued)

Insert 4.b

The Differential Flow—Timer Function delays the Differential Flow—High signals by use of time delay relays. When a Differential Flow—High signal is generated, the time delay relays delay the tripping of the associated RWCU isolation trip system for a short time.

All changes are 1 unless otherwise indicated

BASES

4.i, 4.j

Area

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4.c, 4.d, 4.e, 4.f, 4.g, 4.h. Ambient and Differential Temperature—High 5

Area

Ambient and Differential Temperature—High is provided to detect a leak from the RWCU System. The isolation occurs even when very small leaks have occurred and is diverse to the high differential flow instrumentation for the hot portions of the RWCU System. If the small leak continues without isolation, offsite dose limits may be reached. Credit for these instruments is not taken in any transient or accident analysis in the FSAR, since bounding analyses are performed for large breaks such as MSLBs. u

Area —High

Ambient and differential temperature signals are initiated from temperature elements that are located in the room that is being monitored. There are eight thermocouples that provide input to the Area Temperature—High Function (two per area). Eight channels are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

fourteen

Fourteen

There are four channels for the RWCU heat exchanger area (two in each heat exchanger room), six channels for the RWCU pump and valve room (two in each of the three rooms, two channels for the holdup pipe area, and two channels for the filter/demineralizer valve room area

Twenty-eight

There are 16 thermocouples that provide input to the Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of eight available channels (two per area). Eight channels are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

fourteen

Fourteen

There are four channels for the RWCU heat exchanger areas, six channels for the RWCU pump and valve rooms, two channels for the holdup pipe area, and two for the filter/demineralizer valve room area

Area

The Ambient and Differential Temperature—High Allowable Values are set low enough to detect a leak equivalent to 25 gpm.

5

These Functions isolate the Group 8 valves.

5

~~4.i, 4.j. Main Steam Line Tunnel Ambient and Differential Temperature—High~~

~~Ambient and Differential Temperature—High is provided to detect a leak in the RCPB and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred. If the small leak is allowed to continue without isolation, offsite dose limits may be~~

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4.i. 4.j. Main Steam Line Tunnel Ambient and Differential Temperature—High (continued)

reached. However, credit for these instruments is not taken in any transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

Ambient temperature signals are initiated from thermocouples located in the area being monitored. Two channels of Main Steam Tunnel Temperature—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. Each Function has one temperature element.

There are four thermocouples that provide input to the Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of two available channels.

The Allowable Values are chosen to detect a leak equivalent to 25 gpm.

This Function isolates the Group 8 valves.

5

4.k. Reactor Vessel Water Level—Low Low, Level 2

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some reactor vessel interfaces occurs to isolate the potential sources of a break. The isolation of the RWCU System on Level 2 supports actions to ensure that fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Vessel Water Level—Low Low, Level 2 Function associated with RWCU isolation is not directly assumed in any transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

differential pressure

1

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4.k. Reactor Vessel Water Level—Low Low, Level 2 (continued)

level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since the capability to cool the fuel may be threatened.

This Function isolates the Group ~~8~~ 5 valves.

4.l. SLC System Initiation

The isolation of the RWCU System is required when the SLC System has been initiated to prevent dilution and removal of the boron solution by the RWCU System (Ref. ~~4~~ 8). SLC System initiation signals are initiated from the two SLC pump start signals.

There is no Allowable Value associated with this Function since the channels are mechanically actuated based solely on the position of the SLC System initiation switch es.

Two channels (one from each pump) of SLC System Initiation Function are available and are required to be OPERABLE only in MODES 1 and 2, since these are the only MODES where the reactor can be critical, and these MODES are consistent with the Applicability for the SLC System (LCO 3.1.7) , "SLC System".

This Function isolates the outboard Group 5 valve.

4.m. Manual Initiation

The Manual Initiation push button channels introduce signals into the RWCU System isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific u FSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis.

(continued)

As noted (footnote (b) to Table 3.3.6.1-1), this Function only provides input into one of two trip systems.

All changes are [1] unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

two

4.m. Manual Initiation (continued)

one

There are ~~four~~ two push buttons for the logic, ~~two~~ one manual initiation push button~~s~~ per trip system. There is no Allowable Value for this Function, since the channels are mechanically actuated based solely on the position of the push buttons. [2]

Two

~~Four~~ channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 since these are the MODES in which the RWCU System Isolation automatic Functions are required to be OPERABLE. [2]

This Function isolates the Group 5 valves

RHR [5]

5. Shutdown Cooling System Isolation

[5]

~~5.a. 5.b. Ambient and Differential Temperature—High~~

~~Ambient and Differential Temperature—High is provided to detect a leak from the associated system steam piping. The isolation occurs when a very small leak has occurred and is diverse to the high flow instrumentation. If the small leak is allowed to continue without isolation, offsite dose limits may be reached. These Functions are not assumed in any FSAR transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.~~

~~Ambient and Differential Temperature—High signals are initiated from thermocouples that are appropriately located to protect the system that is being monitored. Two instruments monitor each area. Four channels for RHR Ambient and Differential Temperature—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.~~

~~Eight thermocouples provide input to the Area Ventilation Differential Temperature—High Function. The output of these thermocouples is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from thermocouples that are located in the inlet and outlet of the area cooling system for a total of four available channels.~~

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5.a, 5.b. Ambient and Differential Temperature—High (continued)

The Allowable Values are set low enough to detect a leak equivalent to 25 gpm.

This Function isolates the Group 3 valves.

5

a

5

5.c. Reactor Vessel Water Level—Low, Level 3

Low RPV water level indicates the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some reactor vessel interfaces occurs to begin isolating the potential sources of a break. The Reactor Vessel Water Level—Low, Level 3 Function associated with RHR Shutdown Cooling System isolation is not directly assumed in any transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs. The RHR Shutdown Cooling System isolation on Level 3 supports actions to ensure that the RPV water level does not drop below the top of the active fuel during a vessel draindown event caused by a leak (e.g., pipe break or inadvertent valve opening) in the RHR Shutdown Cooling System.

differential pressure

1

Reactor Vessel Water Level—Low, Level 3 signals are initiated from level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels (two channels per trip system) of the Reactor Vessel Water Level—Low, Level 3 Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. As noted (footnote (c) to Table 3.3.6.1-1), only two channels of the Reactor Vessel Water Level—Low, Level 3 Function are required to be OPERABLE in MODES 4 and 5 ~~(both channels must input into the same trip system)~~ provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained provided the piping is intact and no maintenance is being performed that has the potential for draining the reactor vessel through the system.

4

One trip system is

2

Insert from next Page

The Reactor Vessel Water Level—Low, Level 3 Allowable Value was chosen to be the same as the RPS Reactor Vessel Water

(continued)

BASES 5 a All changes are 1 unless otherwise indicated

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5.a. Reactor Vessel Water Level—Low, Level 3 (continued)

Level—Low, Level 3 Allowable Value (LCO 3.3.1.1) since the capability to cool the fuel may be threatened.

move to previous page 2

The Reactor Vessel Water Level—Low, Level 3 Function is only required to be OPERABLE in MODES 3, 4, and 5 to prevent this potential flow path from lowering reactor vessel level to the top of the fuel. In MODES 1 and 2, the ~~other isolations~~ ~~(e.g.,~~ Reactor Vessel ~~Steam Dome~~ Pressure—High ~~)~~ Function and administrative controls ensure that this flow path remains isolated to prevent unexpected loss of inventory via this flow path.

This Function isolates the Group ~~3~~ 6 valves.

6 5

5.b. Reactor Vessel ~~Steam Dome~~ Pressure—High

The Shutdown Cooling System Reactor Vessel ~~Steam Dome~~ Pressure—High Function is provided to isolate the shutdown cooling portion of the RHR System. This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario and credit for the interlock is not assumed in the accident or transient analysis in the FSAR.

The Reactor Vessel Pressure ~~Steam Dome~~—High ~~pressure~~ signals are initiated from two pressure switches ~~four transmitters~~. Two ~~Four~~ channels of Reactor 5 Vessel ~~Steam Dome~~ Pressure—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. The Allowable Value (corrected for cold water head and reactor vessel flooded) was chosen to be low enough to protect the system equipment from overpressurization.

This Function isolates the Group ~~3~~ 6 valves.

5

~~5.e. Drywell Pressure—High~~

~~High drywell pressure can indicate a break in the RCPB. The isolation of some of the PCIVs on high drywell pressure supports actions to ensure that offsite dose limits of 10 CFR 100 are not exceeded. The Drywell Pressure—High Function associated with isolation of the RHR Shutdown Cooling System is not modeled in any FSAR accident or transient analysis because other leakage paths (e.g., MSIVs) are more limiting.~~

5

Insert 5c

(continued)

Insert 5.c

5.c. Manual Initiation

The Manual Initiation push button channels introduce signals into the RHR Shutdown Cooling System isolation logic that are redundant to the automatic protective instrumentation and provide manual isolation capability. There is no specific UFSAR safety analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the isolation function as required by the NRC in the plant licensing basis.

There is one push button for the logic per trip system. Two channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 since these are the MODES in which the RHR Shutdown Cooling System Isolation automatic Functions are required to be OPERABLE. While certain automatic Functions are required in MODES 4 and 5, the Manual Initiation Function is not required in MODES 4 and 5, since there are other means (i.e., means other than the Manual Initiation push buttons) to manually isolate the RHR Shutdown Cooling System from the control room.

There is no Allowable Value for this Function, since the channels are mechanically actuated based solely on the position of the push buttons.

This Function isolates the Group 6 valves.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

~~5.e. Drywell Pressure—High (continued)~~

~~High drywell pressure signals are initiated from pressure transmitters that sense the pressure in the drywell. Four channels of Drywell Pressure—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.~~

~~The Allowable Value was selected to be the same as the ECCS Drywell Pressure—High Allowable Value (LCO 3.3.5.1), since this may be indicative of a LOCA inside primary containment.~~

~~This Function isolates the Group 3 valves.~~

5

ACTIONS

~~[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]~~

7

5 1 ~~A~~ Note 1 has been provided to modify the ACTIONS related to primary containment isolation instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable primary containment isolation instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable primary containment isolation instrumentation channel.

INSERT ACTIONS

5

2

A.1

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours or 24 hours, depending on the Function, has been shown to be

(12 hours for those Functions that have channel components common to RPS instrumentation and 24 hours for those Functions that do not have channel components common to RPS instrumentation)

(continued)

Insert ACTIONS-1

Note 2 indicates that when automatic isolation capability is lost for Function 1.e, Main Steam Line Tunnel Differential Temperature—High (i.e., when both trip systems are inoperable for Function 1.e) due to required Reactor Building Ventilation System corrective maintenance, filter changes, damper cycling, or for performance of required Surveillances, entry into the associated Conditions and Required Actions may be delayed for up to 4 hours. Similarly, Note 3 indicates that when automatic isolation capability is lost for Function 1.e due to a loss of reactor building ventilation or for performance of SR 3.6.4.1.3 or SR 3.6.4.1.4, entry into the associated Conditions and Required Actions may be delayed for up to 12 hours. Upon completion of the activities or expiration of the time allowance, the channels must be returned to OPERABLE status or the applicable Conditions entered and Required Actions taken. These Notes are necessary so that testing and required Surveillances specified in LCO 3.6.4.1, "Secondary Containment," LCO 3.6.4.2, "Secondary Containment Isolation Valves (SCIV)," and LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," can be performed without inducing an isolation of the MSIVs. The 4 hour and 12 hour allowances provide sufficient time to safely perform the testing. The 12 hour allowance also provides sufficient time to identify and correct minor reactor building ventilation system problems. Since the design of the Unit 1 and Unit 2 reactor buildings is such that they share a common area of the refuel floor (i.e., the reactor buildings are not separated on the refuel floor), operation of either unit's ventilation system will affect the other unit's building differential pressure. Performance of testing to verify secondary containment integrity requirements and minor correctable problems could require a dual unit outage (without the Notes).

BASES All changes are 1 unless otherwise indicated

ACTIONS

A.1 (continued) 9 10

acceptable (Refs. 5 and 6) to permit restoration of any inoperable channel to OPERABLE status. This out of service time is only acceptable provided the associated Function is still maintaining isolation capability (refer to Required Action B.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue with no further restrictions. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), Condition C must be entered and its Required Action taken.

B.1

MSIVs portion of the

NSL drain valves portion of the MSL isolation Functions and the

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic isolation capability being lost for the associated penetration flow path(s). The MSL isolation Functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip such that both trip systems will generate a trip signal from the given Function on a valid signal. The other isolation Functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip such that one trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two PCIVs in the associated penetration flow path can receive an isolation signal from the given Function. For the MSIVs portion of Functions 1.a, 1.b, 1.d, 1.e, and 1.f, this would require both trip systems to have one channel OPERABLE or in trip. For Function 1.c, this would require both trip systems to have one channel, associated with each MSL, OPERABLE or in trip. For Functions 2.a, 2.b, 2.c, 2.d, 2.e, 2.f, 2.g, 3.c (for Group 8 valves) 3.d, 4.k, 5.c, 5.d, and 5.e, this would require one trip system to have two channels, each OPERABLE or in trip. For Functions 3.a, 3.b, 3.c, 3.e, 3.f, 3.g, 3.h, 3.i, 3.l, 3.m, 4.a, 4.b, 4.c, 4.d, 4.g, 4.h, 4.i, 4.j, and 4.l, this would

Insert B.1.a

Insert B.1.b

5.a

(for Group 9 Valves)

5.b

(continued)

Insert B.1a

For the MSL drain valves portion of Functions 1.a, 1.b, 1.d, and 1.e, this would require one trip system to have two channels, each OPERABLE or in trip. For the MSIVs portion of

Insert B.1b

For the MSL drain valves portion of Function 1.c, this would require one trip system to have two channels, associated with each MSL, each OPERABLE or in trip.

BASES

ACTIONS

B.1 (continued)

4.c, 4.d, 4.e, and 4.f

require one trip system to have one channel OPERABLE or in trip. For Functions ~~3.j, 3.k, 4.e, 4.f, 5.a, and 5.b~~, each Function consists of channels that monitor several different locations. Therefore, this would require one channel per location to be OPERABLE or in trip (the channels are not required to be in the same trip system). The Condition does not include the Manual Initiation Functions (Functions 1.g, 2.h, 3.n, ~~and~~ 4.m), since they are not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action A.1) is allowed.

f

g

j

, and 5.c

1

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

C.1

Required Action C.1 directs entry into the appropriate Condition referenced in Table 3.3.6.1-1. The applicable Condition specified in Table 3.3.6.1-1 is Function and MODE or other specified condition dependent and may change as the Required Action of a previous Condition is completed. Each time an inoperable channel has not met any Required Action of Condition A or B and the associated Completion Time has expired, Condition C will be entered for that channel and provides for transfer to the appropriate subsequent Condition.

<Insert from next page> 2

D.1, D.2.1, and D.2.2

2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours (Required Actions D.2.1 and D.2.2). ~~Alternately,~~ 2 the associated MSLs may be isolated (Required Action D.1), and if allowed (i.e., plant safety analysis allows operation with an MSL isolated), plant operation with the MSL isolated

(continued)

This Required Action will generally only be used if a Function 1.c channel is inoperable and untripped. The associated MSL(s) to be isolated are those whose Main Steam Line Flow - High Function channel(s) are inoperable. Alternatively, 2

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

move to previous page 2

may continue. Isolating the affected MSL accomplishes the safety function of the inoperable channel. The Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

E.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 2 within 6 hours.

The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power conditions in an orderly manner and without challenging plant systems.

F.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, plant operation may continue if the affected penetration flow path(s) is isolated. Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable channel~~s~~. 2

Area 1

For some of the ~~Ambient~~ Area and Differential Temperature – High 1 Functions, the affected penetration flow path(s) may be considered isolated by isolating only that portion of the system in the associated room monitored by the inoperable channel. That is, if the RWCU pump room A ~~ambient~~ Area Temperature – High channel is inoperable, the A pump room area can be isolated while allowing continued RWCU operation utilizing the B RWCU pump.

Alternatively, if it is not desired to isolate the affected penetration flow path(s) (e.g., as in the case where isolating the penetration flow path(s) could result in a reactor scram), Condition H must be entered and its Required Actions taken.

(continued)

BASES

ACTIONS

F.1 (continued)

The Completion Time is acceptable because it minimizes risk while allowing sufficient time for plant operations personnel to isolate the affected penetration flow path(s).

G.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, plant operations may continue if the affected penetration flow path(s) is isolated. Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable channels. The 24 hour Completion Time is acceptable due to the fact that these Functions (Manual Initiation) are not assumed in any accident or transient analysis in the FSAR. u 11
Alternately, if it is not desired to isolate the affected penetration flow path(s) (e.g., as in the case where isolating the penetration flow path(s) could result in a reactor scram), Condition H must be entered and its Required Actions taken.

H.1 and H.2

If the channel is not restored to OPERABLE status or placed in trip, or any Required Action of Condition F or G is not met and the associated Completion Time has expired, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

I.1 and I.2

If the channel is not restored to OPERABLE status within the allowed Completion Time, the associated SLC subsystem(s) is declared inoperable or the RWCU System is isolated. Since this Function is required to ensure that the SLC System performs its intended function, sufficient remedial measures

(continued)

BASES

ACTIONS

I.1 and I.2 (continued)

are provided by declaring the associated SLC subsystem inoperable or isolating the RWCU System.

The Completion Time of 1 hour is acceptable because it minimizes risk while allowing sufficient time for personnel to isolate the RWCU System.

J.1 and J.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path should be closed. However, if the shutdown cooling function is needed to provide core cooling, these Required Actions allow the penetration flow path to remain unisolated provided action is immediately initiated to restore the channel to OPERABLE status or to isolate the RHR Shutdown Cooling System (i.e., provide alternate decay heat removal capabilities so the penetration flow path can be isolated). ACTIONS must continue until the channel is restored to OPERABLE status or the RHR Shutdown Cooling System is isolated.

~~K.1, K.2.1, K.2.2, and K.2.3~~

~~If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path(s) should be isolated (Required Action K.1). Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable instrumentation. Alternately, the plant must be placed in a condition in which the LCO does not apply. If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe condition. Also, if applicable, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission production release. Actions must continue until OPDRVs are suspended.~~

5

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~ 7

As noted at the beginning of the SRs, the SRs for each Primary Containment Isolation Instrumentation Function are found in the SRs column of Table 3.3.6.1-1.

4 isolation

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains ~~trip~~ capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analyses (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the PCIVs will isolate the penetration flow path(s) when necessary.

9 1 10 3 e

SR 3.3.6.1.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.1 (continued)

The Frequency is based on operating experience that demonstrates channel failure is rare.

2

The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.6.1.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the intended function. 2

2

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

of 92 days 2 e 3

The Frequency is based on reliability analyses described in References ~~5~~ and ~~6~~. 9 10 11

~~SR 3.3.6.1.3~~

~~The calibration of trip units consists of a test to provide a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.1-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~

~~The Frequency of 92 days is based on the reliability analysis of References 5 and 6.~~

5

(continued)

BASES

3 4 5

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.~~7~~ and SR 3.3.6.1.~~8~~

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations, consistent with the plant specific setpoint methodology.

1 2

~~The Frequency of SR 3.3.6.1.4 is based on the assumption of a 92 day calibration interval in the determination of equipment drift in the setpoint analysis.~~ The Frequenc~~y~~ies ~~of SR 3.3.6.1.5 is~~ are based on the assumption of ~~an 18 month~~ 92 day or 24 month calibration interval, as applicable, in the determination of the magnitude of equipment drift in the setpoint analysis.

2 5

5 5

SR 3.3.6.1.~~6~~

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The ~~18~~ 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the ~~18~~ 24 month Frequency.

5 5

6 5

SR 3.3.6.1.~~7~~

This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the ~~10~~ 13 second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the ~~PCIV~~ MSIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. Insert SR 3.3.6.1.6.a

8 4 2

(continued)

Insert SR 3.3.6.1.6a

However, failure to meet the ISOLATION SYSTEM RESPONSE TIME due to a MSIV closure time not within limits does not require the associated instrumentation to be declared inoperable; only the MSIV is required to be declared inoperable.

BASES

6 5

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.~~7~~ (continued)

response time of the sensors

ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference ~~2~~. 11 1

~~A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detection channels shall be measured from detector output or the input of the first electronic component in the channel.~~ 5

Insert SR 3.3.6.1.6.b 5

ISOLATION SYSTEM RESPONSE TIME tests are conducted on an ~~18~~ 24 month STAGGERED TEST BASIS. The ~~18~~ 24 month test Frequency is consistent with the ~~typical industry~~ refueling cycle and is based upon plant operating experience that shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent. 5 2

REFERENCES

1. UFSAR, Table 6.2-21. 1

~~1~~ 2. UFSAR, Section ~~[6.3]~~ 6.2.1.1.

~~2~~ 3. UFSAR, Chapter [15]. 8

~~3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.~~ 8

4. UFSAR, Section 15.1.3
5. UFSAR, Section 15.6.4
6. UFSAR, Section 15.2.5
7. UFSAR, Section 15.4.9

1

~~4~~ 8. UFSAR, Section [9.3.5].

~~5~~ 9. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," ~~June 1989~~ July 1990 1

~~6~~ 10. NEDC-30851-P-A, Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.

~~7~~ 11. ~~FSAR, Section [7.3]~~ Technical Requirements Manual.

12. NEDO-32291-A, "System Analyses for the Elimination of Selected Response Time Testing Requirements," October 1995.

1

Insert SR 3.3.6.1.6b

assumed to be the design sensor response time and therefore, are excluded from the ISOLATION SYSTEM RESPONSE TIME testing. This is allowed since the sensor response time for the affected Functions (Functions 1.a, 1.b, and 1.c) is a small part of the overall ISOLATION SYSTEM RESPONSE TIME (Ref. 12). However, the response time of the remaining portion of the channel, including trip unit and relay logic, is required to be performed.

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, analysis description, or licensing basis description.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. Typographical/grammatical error corrected.

4. Changes have been made to more closely reflect the Specification requirements.

5. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

6. The proper 10 CFR 50.36(c)(2)(ii) criterion has been used. The current wording was developed prior to the issuance of the change to 10 CFR 50.36, which uses criterion 4 for the current words of the ISTS.

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

8. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.3 INSTRUMENTATION

B 3.3.6.2 Secondary Containment Isolation Instrumentation

All changes are 1 unless otherwise indicated

BASES

BACKGROUND

The secondary containment isolation instrumentation automatically initiates closure of appropriate secondary containment isolation valves (SCIVs) and starts the Standby Gas Treatment (SGT) System. The function of these systems, in combination with other accident mitigation systems, is to limit fission product release during and following postulated Design Basis Accidents (DBAs) (Refs. 1 and 2), such that offsite radiation exposures are maintained within the requirements of 10 CFR 100 that are part of the NRC staff approved licensing basis. Secondary containment isolation and establishment of vacuum with the SGT System within the assumed time limits ensures that fission products that ~~leak from primary containment following a DBA, or are released outside primary containment~~ are released during certain operations that take place inside primary containment or during certain operations when primary containment is not required to be OPERABLE or that take place are maintained within applicable limits.

The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of secondary containment isolation. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a secondary containment isolation signal to the isolation logic. Functional diversity is provided by monitoring a wide range of independent parameters. The input parameters to the isolation logic are (a) reactor vessel water level, (b) drywell pressure, (c) ~~fuel handling area~~ reactor building ventilation exhaust plenum radiation, and (d) fuel ~~handling area~~ pool ~~sweep~~ ventilation exhaust radiation. Redundant sensor input signals from each parameter are provided for initiation of isolation parameters. In addition, manual initiation of the logic is provided.

For ~~all~~ each ~~S~~econdary ~~C~~ontainment ~~I~~solation instrumentation Function~~s~~, ~~both~~ the logic receives input from four channels. The output from these channels ~~in a trip system~~ are ~~required to trip the associated trip system~~ arranged into two two-out-of-two trip systems. In addition to the isolation function, the SGT subsystems are initiated. There are two SGT subsystems with ~~one~~ subsystems being initiated by each trip system. ~~Typically,~~ Automatically isolated secondary containment penetrations are isolated by both two

(continued)

All changes are 1 unless otherwise indicated

BASES

BACKGROUND (continued)

isolation valves. Each ~~One~~ trip system initiates isolation of One of two SCIVs ~~each valve~~ so that operation of either trip system isolates the associated penetrations.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The isolation signals generated by the secondary containment isolation instrumentation are implicitly assumed in the safety analyses of References 1 and 2 to initiate closure of ~~valves~~ the SCIVs and start the SGT System to limit offsite doses.

Refer to LCO 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)," and LCO 3.6.4.3, "Standby Gas Treatment (SGT) System," Applicable Safety Analyses Bases for more detail of the safety analyses.

The secondary containment isolation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~. Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the secondary containment isolation instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions. Each Function must have the required number of OPERABLE channels with their setpoints set within the specified Allowable Values, as shown in Table 3.3.6.2-1. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. 2 A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. 3 ~~Each channel must also respond within its assumed response time, where appropriate.~~

Allowable Values are specified for each Function specified in the Table. Nominal trip setpoints are specified in setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Values between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable.

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated

(continued)

All changes are [1] unless otherwise noted

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~ [1]

[1] Insert ASA

In general, the individual Functions are required to be OPERABLE in the MODES or other specified conditions when SCIVs and the SGT System are required.

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

1. Reactor Vessel Water Level—Low Low, Level 2

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The Reactor Vessel Water Level—Low Low, Level 2 Function is one of the Functions assumed to be OPERABLE and capable of providing isolation and initiation signals. The isolation and initiation of systems on Reactor Vessel Water Level—Low Low, Level 2 support actions to ensure that any offsite releases are within the limits calculated in the safety ~~analysis~~ [1] (Ref. 1).

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from ~~level~~ [1] differential pressure transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available and are required to be OPERABLE to ensure that no

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Reactor Vessel Water Level—Low Low, Level 2 (continued)

single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level—Low Low, Level 2 Allowable Value was chosen to be the same as the High Pressure Core Spray (HPCS)/Reactor Core Isolation Cooling (RCIC) Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," and LCO 3.3.5.2, "Reactor Core Isolation Cooling (RCIC) System ~~Actuation~~ Instrumentation 4"), since this could indicate the capability to cool the fuel is being threatened.

The Reactor Vessel Water Level—Low Low, Level 2 Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the Reactor Coolant System (RCS); thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, this Function is not required. In addition, the Function is also required to be OPERABLE during operations with a potential for draining the reactor vessel (OPDRVs) ~~because the capability of isolating potential sources of leakage must be provided~~ 1 to ensure that offsite dose limits are not exceeded if core damage occurs.

2. Drywell Pressure—High

High drywell pressure can indicate a break in the reactor coolant pressure boundary (RCPB). An isolation of the secondary containment and actuation of the SGT System are initiated in order to minimize the potential of an offsite dose release. The isolation and initiation of systems on 1 ~~of High~~ drywell pressure -High supports actions to ensure that any offsite releases are within the limits calculated in the safety analysis. However, the Drywell Pressure—High Function associated with isolation is not assumed in any u 1 FSAR accident or transient analysis. It is retained for the overall redundancy and diversity of the secondary containment isolation instrumentation as required by the NRC approved licensing basis.

(continued)

All changes are 1 unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2. Drywell Pressure—High (continued)

High drywell pressure signals are initiated from pressure ~~transmitters~~ switches that sense the pressure in the drywell. Four channels of Drywell Pressure—High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. 2

The Allowable Value was chosen to be the same as the ECCS RPS Drywell Pressure—High Function Allowable Value (LCO 3.3.5.1) since this is indicative of a loss of coolant accident. 1

The Drywell Pressure—High Function is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the RCS; thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. This Function is not required in MODES 4 and 5 because the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES.

3, 4. ~~Fuel Handling Area~~ Reactor Building Ventilation Exhaust Plenum and ~~Pool Sweep~~ Fuel Pool Ventilation Exhaust Radiation—High ~~High~~

High secondary containment exhaust radiation is an indication of possible gross failure of the fuel cladding. The release may have originated from the primary containment due to a break in the RCPB or the refueling floor due to a fuel handling accident. When Exhaust Radiation—High ~~High~~ is detected, secondary containment isolation and actuation of the SGT System are initiated to limit the release of fission products as assumed in the FSAR safety analyses (Ref. 1 and 2). 4

5 Reactor Building Ventilation Exhaust Plenum Radiation-High signals are initiated from radiation detectors that are located in the reactor building return air riser above the upper area of the steam tunnel prior to the reactor building ventilation isolation dampers.

~~The~~ Fuel Pool Ventilation Exhaust Radiation—High ~~High~~ signals are initiated from radiation detectors that are located ~~on~~ in the ~~ventilation~~ reactor building exhaust ~~piping~~ ducting coming from the ~~fuel handling area and the fuel handling area pool sweep, respectively~~ refuel floor. The signal from each detector is input to an individual monitor whose trip outputs are assigned to an isolation channel. Four channels of ~~Fuel Handling Area~~ Reactor Building Ventilation Exhaust Plenum Radiation—High ~~High~~ Function and four channels of Fuel ~~Handling Area~~ Pool ~~Sweep~~ Ventilation Exhaust Radiation—High ~~High~~ Function are available and are required to be OPERABLE to

(continued)

Reactor Building Exhaust Plenum Fuel Pool Ventilation 1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3, 4. ~~Fuel Handling Area~~ Ventilation ~~and~~ ~~Pool Sweep~~ Exhaust Radiation—High ~~High~~ (continued)

ensure that no single instrument failure can preclude the isolation function.

The Allowable Values are chosen to promptly detect gross failure of the fuel cladding.

Plenum and Fuel Pool Ventilation Exhaust 1 Reactor Building Ventilation

The Exhaust Radiation—High ~~High~~ Functions are required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists; thus, there is a probability of pipe breaks resulting in significant releases of radioactive steam and gas. In MODES 4 and 5, the probability and consequences of these events are low due to the RCS pressure and temperature limitations of these MODES; thus, these Functions are not required. In addition, the Functions are required to be OPERABLE during CORE ALTERATIONS, OPDRVs, and movement of irradiated fuel assemblies in the ~~primary or~~ secondary containment because the capability of detecting radiation releases due to fuel failures (due to fuel uncovery or dropped fuel assemblies) must be provided to ensure that offsite dose limits are not exceeded. 1

5. Manual Initiation

1 U

The Manual Initiation push button channels introduce signals into the secondary containment isolation logic that are redundant to the automatic protective instrumentation channels, and provide manual isolation capability. There is no specific FSAR safety analysis that takes credit for this Function. It is retained for the overall redundancy and diversity of the secondary containment isolation instrumentation as required by the NRC approved licensing basis.

Insert from next page

is one manual initiation

There ~~are four~~ push buttons for the logic, ~~two manual initiation push buttons~~ per trip system. There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons. 1

2

1 Two

~~Four~~ channels of the Manual Initiation Function are available and are required to be OPERABLE in MODES 1, 2, and 3 and during CORE ALTERATIONS, OPDRVs, and movement of

(continued)

BASES

<move to next page as indicated> 2

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5. Manual Initiation (continued)

irradiated fuel assemblies in the secondary containment, since these are the MODES and other specified conditions in which the Secondary Containment Isolation automatic Functions are required to be OPERABLE.

ACTIONS

~~[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]~~ 5

A Note has been provided to modify the ACTIONS related to secondary containment isolation instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable secondary containment isolation instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable secondary containment isolation instrumentation channel.

A.1

2

(12 hours for those Functions that have channel components common to RPS instrumentation and 24 hours for those Functions that do not have channel components common to RPS instrumentation)

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours or 24 hours, depending on the Function, has been shown to be acceptable (Refs. 3 and ~~4~~) to permit restoration of any inoperable channel to OPERABLE status. This out of service time is only acceptable provided the associated Function is still maintaining isolation capability (refer to Required Action B.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of

(continued)

BASES

ACTIONS

A.1 (continued)

service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), Condition C must be entered and its Required Actions taken.

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic isolation capability for the associated penetration flow path(s) or a complete loss of automatic initiation capability for the SGT System. A Function is considered to be maintaining ~~secondary containment~~ isolation capability when sufficient channels are OPERABLE or in trip, such that one trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two SCIVs in the associated penetration flow path and one SGT subsystem can be initiated on an isolation signal from the given Function. For the Functions with two two-out-of-two logic trip systems (Functions 1, 2, 3, and 4), this would require one trip system to have two channels, each OPERABLE or in trip. The Condition does not include the Manual Initiation Function (Function 5), since it is not assumed in any accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action A.1) is allowed.

[1] [3]

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

(continued)

BASES

ACTIONS (continued)

C.1.1, C.1.2, C.2.1, and C.2.2

3

penetration flow path(s)

If any Required Action and associated Completion Time ~~of Condition A or B~~ are not met, the ability to isolate the secondary containment and start the SGT System cannot be ensured. Therefore, further actions must be performed to ensure the ability to maintain the secondary containment function. Isolating the associated ~~valves~~ and starting the associated SGT subsystem(s) (Required Actions C.1.1 and C.2.1) performs the intended function of the instrumentation and allows operations to continue.

1

The method used to place the SGT subsystem(s) in operation must provide for automatically reinitiating the subsystem(s) upon restoration of power following a loss of power to the SGT subsystem(s)

3 Alternatively, declaring the associated SCIVs or SGT subsystem(s) inoperable (Required Actions C.1.2 and C.2.2) is also acceptable since the Required Actions of the respective LCOs (LCO 3.6.4.2 and LCO 3.6.4.3) provide appropriate actions for the inoperable components.

One hour is sufficient for plant operations personnel to establish required plant conditions or to declare the associated components inoperable without challenging plant systems.

SURVEILLANCE REQUIREMENTS

~~[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]~~ 5

As noted at the beginning of the SRs, the SRs for each Secondary Containment Isolation instrumentation Function are located in the SRs column of Table 3.3.6.2-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains ~~secondary containment~~ isolation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Action(s) taken. 3

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

This Note is based on the reliability analysis (Refs. 3 and 4) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the SCIVs will isolate the associated penetration flow paths and the SGT System will initiate when necessary.

SR 3.3.6.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated parameter for one instrument channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

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

SR 3.3.6.2.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

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Insert from next page 2

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.2 (continued)

move to previous page [2]

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of References 3 and 4.

~~SR 3.3.6.2.3~~

~~Calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.2-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~

~~The Frequency of 92 days is based on the reliability analysis of References 3 and 4.~~

[3]

SR 3.3.6.2.4 3 [3]

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 24 [3] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.2.5 4 3

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing, performed on SCIVs and the SGT System in LCO 3.6.4.2 and LCO 3.6.4.3, respectively, overlaps this Surveillance to provide complete testing of the assumed safety function.

24 3

The ~~18~~ 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the ~~18~~ 24 month Frequency. 3

~~SR 3.3.6.2.6~~

~~This SR ensures that the individual channel response times are less than or equal to the maximum values assumed in the accident analysis. Testing is performed only on channels where the assumed response time does not correspond to the diesel generator (DG) start time. For channels assumed to respond within the DG start time, sufficient margin exists in the [10] second start time when compared to the typical channel response time (milliseconds) so as to assure adequate response without a specific measurement test. The instrument response times must be added to the SCIV closure times to obtain the ISOLATION SYSTEM RESPONSE TIME. ISOLATION SYSTEM RESPONSE TIME acceptance criteria are included in Reference 5.~~ 3

~~A Note to the Surveillance states that the radiation detectors may be excluded from ISOLATION SYSTEM RESPONSE TIME testing. This Note is necessary because of the difficulty of generating an appropriate detector input signal and because the principles of detector operation virtually ensure an instantaneous response time. Response time for radiation detector channels shall be measured from detector output or the input of the first electronic component in the channel.~~

~~ISOLATION SYSTEM RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS. The 18 month Frequency is consistent with the typical industry refueling cycle and is~~

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.2.6 (continued)

based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. 3

REFERENCES 1 4

1. FSAR, Section ~~[6.3]~~ 15.6.5.
2. FSAR, ~~Chapter~~ Section ~~[15]~~ 15.7.4. 6
3. NEDC-31677-P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
4. NEDC-30851-P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentations Common to RPS and ECCS Instrumentation," March 1989.
5. FSAR, Section [7.3]. 3

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, analysis description, or licensing basis description.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. Changes have been made to reflect those changes made to the Specification or to be consistent with the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

4. The correct LCO title has been provided.

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

6. The brackets have been removed and the proper plant specific information/value has been provided.

1

B 3.3 INSTRUMENTATION

B 3.3.6.3 Residual Heat Removal (RHR) Containment Spray System Instrumentation

BASES

BACKGROUND

The RHR Containment Spray System is an operating mode of the RHR System that is initiated to condense steam in the containment atmosphere. This ensures that containment pressure is maintained within its limits following a loss of coolant accident (LOCA). The RHR Containment Spray System can be initiated either automatically or manually.

The RHR Containment Spray System is automatically initiated by Reactor Vessel Water Level—Low Low Low, Level 1, Drywell Pressure—High, and Containment Pressure—High signals. Most channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a signal to the trip logic. The channels provide inputs to two trip systems; one trip system initiates one containment spray subsystem while the second trip system initiates the other containment spray subsystem (Ref. 1). For a trip system to initiate the associated subsystem, it must receive one signal from each of the following inputs: Drywell Pressure—High, Containment Pressure—High, and a System Timer. The Drywell Pressure—High and Containment Pressure—High Functions each have two channels, which are arranged in a one-out-of-two logic to provide the necessary signal. The System Timer is initiated by a one-out-of-two taken twice logic consisting of two channels each of the Reactor Vessel Water Level—Low Low Low, Level 1 and Drywell Pressure—High Functions. When the System Timer has timed out, the trip system receives the System Timer signal.

Manual initiation of the system is accomplished with the use of manual initiation push buttons. The system can be manually initiated using the manual initiation push buttons only if a Drywell Pressure—High signal is present. There is no time delay when using the manual initiation push buttons.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

Operation of the RHR Containment Spray System is required to maintain containment pressure within design limits after a LOCA. Safety analyses in Reference 2 implicitly assume that sufficient instrumentation and controls, described below, are available to initiate the RHR Containment Spray System.

The RHR Containment Spray System instrumentation satisfies Criterion 3 of the NRC Policy Statement. Certain instrumentation Functions are retained for other reasons and are described below in the individual Functions discussion.

The OPERABILITY of the RHR Containment Spray System instrumentation is dependent on the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.6.3-1. Each Function must have the required number of OPERABLE channels with their setpoints within the specified Allowable Values. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value, where appropriate. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Allowable Values are specified for each Function in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable.

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments, as defined by 10 CFR 50.49) are accounted for.

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

These uncertainties are described in the setpoint methodology.

The RHR Containment Spray System instrumentation is required to be OPERABLE in MODES 1, 2, and 3, when considerable energy exists in the Reactor Coolant System and a Design Basis Accident (DBA) could cause pressurization of the primary containment. In MODES 4 and 5, the reactor is shut down, and any LOCA would not cause pressurization of the drywell or containment.

The specific Applicable Safety Analyses and LCO discussions are listed below on a Function by Function basis.

1. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The RHR Containment Spray System mitigates the consequences of steam leaking from the drywell directly into containment airspace, bypassing the suppression pool.

Four Drywell Pressure—High transmitters (two per trip system) are available and are required to be OPERABLE and capable of automatically initiating the RHR Containment Spray System. This ensures that no single instrument failure can preclude the RHR containment spray function. The Drywell Pressure—High Allowable Value is chosen to be the same as the Emergency Core Cooling Systems (ECCS) Drywell Pressure—High Allowable Value (LCO 3.3.5.1, "Emergency Core Cooling Systems (ECCS) Instrumentation") since this could be indicative of a LOCA.

2. Containment Pressure—High

High pressure in the containment could indicate a break in the RCPB. The RHR Containment Spray System mitigates the consequences of steam leaking from the drywell directly into the containment airspace, bypassing the suppression pool.

Four Containment Pressure—High transmitters are available, but only two Containment Pressure—High transmitters (one per trip system) are required to be OPERABLE and capable of automatically initiating the RHR Containment Spray System.

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2. Containment Pressure—High (continued)

This ensures that no single instrument failure can preclude the RHR containment spray function.

The Containment Pressure—High Allowable Value is chosen to ensure the primary containment design pressure is not exceeded.

3. Reactor Vessel Water Level—Low Low Low, Level 1

Low reactor pressure vessel (RPV) water level indicates that a break of the RCPB may have occurred and the capability to maintain the primary containment pressure within design limits may be threatened. The RHR Containment Spray System mitigates the consequences of the steam leaking from the drywell directly into the containment airspace, bypassing the suppression pool.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low Low, Level 1 (two per trip system) are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the RHR containment spray function.

The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is chosen to be the same as the ECCS Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value (LCO 3.3.5.1) since this could be indicative of a LOCA.

4. System A and System B Timers

The purpose of these timers is to delay automatic initiation of the RHR Containment Spray System for approximately 10 minutes after low pressure coolant injection (LPCI) initiation to give the LPCI System time to fulfill its ECCS function in response to a LOCA. The time delay is needed since the RHR Containment Spray System utilizes the same pumps as the LPCI subsystem (RHR pumps).

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4. System A and System B Timers (continued)

There are two timers, one for each subsystem, designated System A Timer and System B Timer. Since each subsystem of the RHR Containment Spray System has a timer, a single failure of a timer will cause the failure of only one RHR containment spray subsystem. The other subsystem will still be available to perform the RHR containment spray cooling function. The Allowable Value for the time delay is chosen to be long enough to allow the LPCI System to fulfill its function, but short enough to prevent containment pressure from exceeding the design limit.

5. Manual Initiation

The Manual Initiation Function introduces signals into the RHR containment spray logic and is redundant to all automatic protective instrumentation except Drywell Pressure—High. There is no specific FSAR analysis that takes credit for this Function. It is retained for overall redundancy and diversity of the initiation Function as required by the NRC approved licensing basis. Each trip system has a manual push button, for a total of two push buttons, both of which are required to be OPERABLE.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

ACTIONS

[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]

A Note has been provided to modify the ACTIONS related to RHR Containment Spray System instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the

(continued)

BASES

ACTIONS (continued)

Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RHR Containment Spray System instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RHR Containment Spray System instrumentation channel.

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.6.3-1. The applicable Condition specified in the table is Function dependent. Each time a channel is discovered inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

B.1 and B.2

Required Action B.1 is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic initiation capability for the RHR Containment Spray System. Automatic initiation capability is lost if one Function 1 channel in both trip systems is inoperable and untripped, or one Function 3 channel in both trip systems is inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action B.2 is not appropriate and the RHR Containment Spray System, made inoperable by RHR Containment Spray System instrumentation, must be declared inoperable within 1 hour after discovery of loss of RHR Containment Spray System initiation capability for both trip systems.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that the RHR Containment Spray System cannot be automatically initiated due to inoperable, untripped channels within the same Function, as described in the

(continued)

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BASES

ACTIONS

B.1 and B.2 (continued)

paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide initiation signals, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition, per Required Action B.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore the capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition D must be entered and its Required Action taken.

C.1 and C.2

Required Action C.1 is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in automatic initiation capability being lost for the RHR Containment Spray System. Automatic initiation capability is lost if two Function 2 channels or two Function 4 channels are inoperable. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action C.2 is not appropriate and the associated RHR Containment Spray System must be declared inoperable within 1 hour after discovery of loss of RHR Containment Spray System initiation capability for both trip systems. As noted, Required Action C.1 is only applicable for Functions 2 and 4. The Required Action is not applicable to Function 5 (which also requires entry into this Condition if a channel in this Function is inoperable) since it is the Manual Initiation Function and is not assumed in any FSAR accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action C.2) is allowed.

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BASES

ACTIONS

C.1 and C.2 (continued)

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action C.1, the Completion Time only begins upon discovery that the RHR Containment Spray System cannot be automatically initiated due to two inoperable channels within the same Function. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Because of the redundancy of sensors available to provide initiation signals, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition D must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action could either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

D.1

With any Required Action and associated Completion Time not met, the associated RHR containment spray subsystem may be incapable of performing the intended function and the RHR containment spray subsystem associated with inoperable untripped channels must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]

As noted at the beginning of the SRs, the SRs for each RHR Containment Spray System Function are located in the SRs column of Table 3.3.6.3-1.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RHR containment spray initiation capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RHR containment spray will initiate when necessary.

SR 3.3.6.3.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon 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 channels required by the LCO.

(continued)

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of Reference 3.

SR 3.3.6.3.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.3-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based upon the reliability analysis of Reference 3.

SR 3.3.6.3.4 and SR 3.3.6.3.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.6.3.4 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

(continued)

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.3.4 and SR 3.3.6.3.5 (continued)

The Frequency of SR 3.3.6.3.5 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.6.3.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.6.1.7, "Residual Heat Removal (RHR) Containment Spray," overlaps this Surveillance to provide complete testing of the assumed safety function.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [ ], Figure [ ].

2. FSAR, Section [6.2.1.1.5].

3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ISTS BASES: 3.3.6.3 - RHR CONTAINMENT SPRAY SYSTEM INSTRUMENTATION

1. The Bases section has been deleted because the associated Specification has been deleted.

1

B 3.3 INSTRUMENTATION

B 3.3.6.4 Suppression Pool Makeup (SPMU) System Instrumentation

BASES

BACKGROUND

The SPMU System provides water from the upper containment pool to the suppression pool, by gravity flow, after a loss of coolant accident (LOCA) to ensure that primary containment temperature and pressure design limits are met. The SPMU System is automatically initiated by signals generated by Reactor Vessel Water Level—Low Low, Level 2; Reactor Vessel Water Level—Low Low Low, Level 1; Drywell Pressure—High; and Suppression Pool Water Level—Low Low channels. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a signal to the trip logic. The channels provide inputs to two trip systems; one trip system initiates one SPMU subsystem while the second trip system initiates the other SPMU subsystem (Ref. 1). Two separate initiation logics are provided for each trip system.

One initiation logic for a trip system will initiate the associated subsystem if a LOCA signal coincident with a Suppression Pool Water Level—Low Low signal is received. The LOCA signal is received from the associated division of low pressure Emergency Core Cooling Systems (ECCS) initiation signal (i.e., two channels of Reactor Vessel Water Level—Low Low Low, Level 1 and two channels of Drywell Pressure—High are arranged in a one-out-of-two taken twice logic). Two channels of Suppression Pool Water Level—Low Low are arranged in a one-out-of-two logic, which generates the Suppression Pool Water Level—Low Low signal. The associated low pressure ECCS division's Manual Initiation push button (one per division) also supplies a signal, which manually performs the same function as the automatic LOCA signal (i.e., ECCS Manual Initiation coincident with a Suppression Pool Water Level—Low Low will initiate the trip system). Two SPMU Manual Initiation push buttons are also provided (arranged in a one-out-of-two logic), which manually perform the same function as the automatic Suppression Pool Water Level—Low Low signal.

The second initiation logic for a trip system will initiate after a time delay of approximately 30 minutes when Drywell

(continued)

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BASES

BACKGROUND (continued)

Pressure—High (a different Function from the Drywell Pressure—High Function described above) and Reactor Vessel Water Level—Low Low, Level 2 signals are received. Two channels of each of these two variables are arranged in a one-out-of-two taken twice logic. Once actuated, this logic starts the timer, and once the timer times out, the trip system initiates the associated SPMU subsystem. Two manual initiation push buttons (the same push buttons as the primary and secondary containment isolation manual initiation push buttons), arranged in a two-out-of-two logic, are also provided, which perform the same function as the two variables (i.e., the manual initiation push buttons will start the timer to initiate an associated SPMU subsystem).

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

The SPMU System is relied upon to dump upper containment pool water to the suppression pool to maintain drywell horizontal vent coverage and an adequate suppression pool heat sink volume to ensure that the primary containment internal pressure and temperature stay within design limits (Ref. 2).

The SPMU System instrumentation satisfies Criterion 3 of the NRC Policy Statement. Certain instrumentation Functions are retained for other reasons and are described in the individual Functions discussion.

The OPERABILITY of the SPMU System instrumentation is dependent on the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.6.4-1. Each Function must have the required number of OPERABLE channels with their setpoints within the specified Allowable Value, where appropriate. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Allowable Values are specified for each Function in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure the setpoints do not exceed the Allowable Values between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal setpoint, but within the Allowable Value, is acceptable.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel water level), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

The SPMU System instrumentation is required to be OPERABLE in MODES 1, 2, and 3 where considerable energy exists in the Reactor Coolant System and a DBA could cause pressurization and heatup of the primary containment. In MODES 4 and 5, the reactor is shut down; therefore, any LOCA would not cause pressurization of the drywell, and the SPMU System would not be needed to maintain suppression pool water level. Furthermore, in MODES 4 and 5, the SPMU System is not required since there is insufficient energy to heat up the suppression pool in the event of a LOCA.

The specific Applicable Safety Analyses and LCO discussions are listed below on a Function by Function basis.

1. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). The Drywell Pressure—High is one of the Functions required to be OPERABLE and capable of initiating the SPMU System during the postulated accident. This protection is required to ensure primary containment temperature and pressure design limits are not exceeded during a LOCA. Accident analysis assumes that the suppression pool vents remain covered during a LOCA. Therefore, this signal is used to dump water from the upper containment pool into the suppression pool as assumed in the large break LOCA analysis.

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Drywell Pressure—High (continued)

High drywell pressure signals are initiated from pressure transmitters that sense the pressure at four different locations in the drywell. Four channels of Drywell Pressure—High Function (two channels per trip system) are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function.

The Allowable Value is chosen to be the same as the ECCS Drywell Pressure—High Allowable Value (LCO 3.3.5.1, "Emergency Core Cooling Systems (ECCS) Instrumentation"), since this could be indicative of a LOCA.

2. Reactor Vessel Water Level—Low Low Low, Level 1

Low reactor pressure vessel (RPV) water level indicates that a LOCA may have occurred and the capability to maintain the primary containment temperature and pressure and suppression pool level design limits may be threatened. Accident analysis assumes that the suppression pool vents remain covered during a LOCA. Therefore, this signal is used to dump water from the upper containment pool into the suppression pool as assumed in the large break LOCA analysis.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of reactor vessel water level (two channels per trip system) are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function. The Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value is chosen to be the same as the ECCS Reactor Vessel Water Level—Low Low Low, Level 1 Allowable Value (LCO 3.3.5.1), since this could be indicative of a LOCA.

3. Suppression Pool Water Level—Low Low

The Suppression Pool Water Level—Low Low signal provides assurance that the water level in the suppression pool will

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3. Suppression Pool Water Level—Low Low (continued)

not drop below that required to keep the suppression pool vents covered for all LOCA break sizes. Accident analyses assume that the suppression pool vents remain covered during a LOCA. Therefore, the signal indicating low suppression pool water level is used to dump water from the upper containment pool into the suppression pool as assumed in the large break LOCA analysis.

Suppression pool water level signals are from four transmitters that sense pool level at four different locations (two per trip system). However, only two of the four Suppression Pool Water Level—Low Low channels (one per trip system) are required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function due to the redundancy of the Function.

The Allowable Value is set high enough to ensure coverage of the suppression pool vents.

4. Drywell Pressure—High

High pressure in the drywell could indicate a break in the RCPB. The Drywell Pressure—High is one of the Functions required to be OPERABLE and capable of initiating the SPMU System during the postulated accident. This protection is required to ensure primary containment temperature and pressure design limits are not exceeded during a small break LOCA.

High drywell pressure signals are initiated from pressure transmitters that sense the pressure at four different locations in the drywell. Four channels of Drywell Pressure—High Function (two channels per trip system) are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function.

The Allowable Value is chosen to be the same as the RPS Drywell Pressure—High Allowable Value (LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"), since this could be indicative of a LOCA.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

5. Reactor Vessel Water Level—Low Low, Level 2

Low RPV water level indicates that a LOCA may have occurred and that the capability to maintain the primary containment temperature and pressure and suppression pool design limits during a small break LOCA may be threatened.

Reactor vessel water level signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 (two per trip system) are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function. The Allowable Value is chosen to be the same as the HPCS Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.5.1), since this could be indicative of a LOCA.

6. Timer

The SPMU System valves open on a Drywell Pressure—High and/or Reactor Vessel Water Level—Low Low, Level 2 signal after about a 30 minute timer delay, where the timer itself is started by these signals. The minimum suppression pool volume, without an upper pool dump, is adequate to meet all heat sink requirements for 30 minutes during a small break LOCA.

There are two SPMU System timers (one per trip system). Two timers are available and are required to be OPERABLE to ensure that no single timer failure can preclude the SPMU System function. The Allowable Value is chosen to be short enough to ensure that the suppression pool will serve as an adequate heat sink during a small break LOCA.

7. Manual Initiation

The SPMU System Manual Initiation push button channels produce signals to provide manual initiation capabilities that are redundant to the automatic protective instrumentation. The Manual Initiation Function is not assumed in any transient or accident analysis in the FSAR. However, the Function is retained for overall redundancy and

(continued)

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

7. Manual Initiation (continued)

diversity of the SPMU System as required by the NRC in the approved licensing basis.

Four manual initiation push buttons (two per trip system) are available and required to be OPERABLE to ensure that no single instrument failure can preclude the SPMU System function. There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

ACTIONS

[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]

A Note has been provided to modify the ACTIONS related to SPMU System instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable SPMU System instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable SPMU System instrumentation channel.

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.6.4-1. The applicable Condition specified in the Table is Function dependent. Each time a channel is discovered inoperable, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition.

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BASES

ACTIONS (continued)

B.1 and B.2

Required Action B.1 is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic initiation capability for the SPMU System. In this case, automatic initiation capability is lost if (a) one Function 1 channel in both trip systems is inoperable and untripped, (b) one Function 2 channel in both trip systems is inoperable and untripped, (c) one Function 4 channel in both trip systems is inoperable and untripped, or (d) one Function 5 channel in both trip systems is inoperable and untripped. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action B.2 is not appropriate and the SPMU System must be declared inoperable within 1 hour after discovery of loss of SPMU initiation capability for both trip systems.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action B.1, the Completion Time only begins upon discovery that the SPMU System cannot be automatically initiated due to inoperable, untripped channels within the same Function as described in the paragraph above. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

Because of the redundancy of sensors available to provide initiation signals, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action B.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition D must be entered and its Required Action taken.

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BASES

ACTIONS (continued)

C.1 and C.2

Required Action C.1 is intended to ensure appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in a complete loss of automatic initiation capability for the SPMU System. In this case, automatic initiation capability is lost if two Function 3 channels or two Function 6 channels are inoperable. In this situation (loss of automatic initiation capability), the 24 hour allowance of Required Action C.2 is not appropriate and the SPMU System must be declared inoperable within 1 hour after discovery of loss of SPMU initiation capability for both trip systems. As noted, Required Action C.1 is only applicable for Functions 3 and 6. Required Action C.1 is not applicable to Function 7 (which also requires entry into this Condition if a channel in this Function is inoperable), since it is the Manual Initiation Function and is not assumed in any FSAR accident or transient analysis. Thus, a total loss of manual initiation capability for 24 hours (as allowed by Required Action C.2) is allowed.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action C.1, the Completion Time only begins upon discovery that the SPMU System cannot be automatically initiated due to two inoperable channels within the same Function. The 1 hour Completion Time from discovery of loss of initiation capability is acceptable because it minimizes risk while allowing time for restoration of channels.

Because of the redundancy of sensors available to provide initiation signals, an allowable out of service time of 24 hours has been shown to be acceptable (Ref. 3) to permit restoration of any inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition D must be entered and its Required Action taken. The Required Actions do not allow placing the channel in trip since this action could either cause the initiation or it would not necessarily result in a safe state for the channel in all events.

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BASES

ACTIONS (continued)

D.1

With any Required Action and associated Completion Time not met, the associated SPMU subsystem may be incapable of performing the intended function and the SPMU subsystem associated with inoperable, untripped channels must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]

As noted at the beginning of the SRs, the SRs for each SPMU System Function are located in the SRs column of Table 3.3.6.4-1.

The Surveillances are also modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains suppression pool makeup capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the SPMU will initiate when necessary.

SR 3.3.6.4.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or

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SURVEILLANCE REQUIREMENTS

SR 3.3.6.4.1 (continued)

something even more serious. A CHANNEL CHECK will detect gross channel failure; thus it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Frequency is based upon 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 required channels of the LCO.

SR 3.3.6.4.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure the entire channel will perform the intended function.

Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

SR 3.3.6.4.3

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in Table 3.3.6.4-1. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.4.3 (continued)

be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

SR 3.3.6.4.4 and SR 3.3.6.4.5

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.6.4.4 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.4.5 is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.6.4.6

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.6.2.4, "Suppression Pool Makeup (SPMU) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

(continued)

BASES (continued)

REFERENCES

1. FSAR, Figure [ ].
2. FSAR, Section [6.2.7.3].
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

1. The Bases section has been deleted because the associated Specification has been deleted.

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B 3.3 INSTRUMENTATION

B 3.3.6.5 Relief and Low-Low Set (LLS) Instrumentation

BASES

BACKGROUND

The safety/relief valves (S/RVs) prevent overpressurization of the nuclear steam system. Instrumentation is provided to support two modes of S/RV operation—the relief function (all valves) and the LLS function (selected valves). Refer to LCO 3.4.4, "Safety/Relief Valves (S/RVs)," and LCO 3.6.1.6, "Low-Low Set (LLS) Safety/Relief Valves (S/RVs)," for Applicability Bases for additional information of these modes of S/RV operation.

The relief function of the S/RVs prevents overpressurization of the nuclear steam system. The LLS function of the S/RVs is designed to mitigate the effects of postulated thrust loads on the S/RV discharge lines by preventing subsequent actuations with an elevated water leg in the S/RV discharge line. It also mitigates the effects of postulated pressure loads on the containment by preventing multiple actuations in rapid succession of the S/RVs subsequent to their initial actuation.

Upon any S/RV actuation, the LLS logic assigns preset opening and reclosing setpoints to six preselected S/RVs. These setpoints are selected to override the normal relief setpoints such that the LLS S/RVs will stay open longer, thus releasing more steam (energy) to the suppression pool; hence more energy (and time) is required for repressurization and subsequent S/RV openings. The LLS logic increases the time between (or prevents) subsequent actuations to allow the high water leg created from the initial S/RV opening to return to (or fall below) its normal water level, thus reducing thrust loads from subsequent actuations to within their design limits. In addition, the LLS is designed to limit S/RV subsequent actuations to one valve, so that containment loads will also be reduced.

The relief instrumentation consists of two trip systems, with each trip system actuating one solenoid for each S/RV. There are two solenoids per S/RV, and each solenoid can open its respective S/RV. The relief mode (S/RVs and associated trip systems) is divided into three setpoint groups (the low with one S/RV, the medium with 10 S/RVs, and the high with nine S/RVs). The S/RV relief function is actuated by

(continued)

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BASES

BACKGROUND (continued)

transmitters that monitor reactor steam dome pressure. The reactor steam dome pressure transmitters send signals to trip units whose outputs are arranged in a two-out-of-two logic for each trip system in each of three separate setpoint groups (e.g., the medium group of 10 S/RVs opens when at least one of the associated trip systems trips at its assigned setpoint). Once an S/RV has been opened, it will reclose when reactor steam dome pressure decreases below the opening pressure setpoint. This logic arrangement ensures that no single instrument failure can preclude the S/RV relief function.

The LLS logic consists of two trip systems similar to the S/RV relief function. Either trip system can actuate the LLS S/RVs by energizing the associated solenoids on the S/RV pilot valves. Each LLS trip system is enabled and sealed in upon initial S/RV actuation from the existing reactor steam dome pressure sensors of any of the normal relief setpoint groups. The reactor steam dome pressure channels used to arm LLS are arranged in a one-out-of-three taken twice logic. The reactor steam dome pressure channels that control the opening and closing of the LLS S/RVs are arranged in either a one-out-of-one or a two-out-of-two logic depending on which LLS S/RV group is being controlled. This logic arrangement ensures that no single instrument failure can preclude the LLS S/RV function. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a LLS or relief initiation signal, as applicable, to the initiation logic.

APPLICABLE SAFETY ANALYSES

The relief and LLS instrumentation are designed to prevent overpressurization of the nuclear steam system and to ensure that the containment loads remain within the primary containment design basis (Ref. 1).

Relief and LLS instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

The LCO requires OPERABILITY of sufficient relief and LLS instrumentation channels to provide adequate assurance of

(continued)

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BASES

LCO (continued)

successfully accomplishing the relief and LLS function, assuming any single instrumentation channel failure within the LLS logic. Therefore, two trip systems are required to be OPERABLE. The OPERABILITY of each trip system is dependent upon the OPERABILITY of the reactor steam dome pressure channels associated with required relief and LLS S/RVs. Each required channel shall have its setpoint within the specified Allowable Value. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Allowable Values are specified for each channel in SR 3.3.6.5.3. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable.

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., reactor vessel pressure), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined, accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.

For relief, the actuating Allowable Values are based on the transient event of main steam isolation valve (MSIV) closure with an indirect scram (i.e., neutron flux). This analysis is described in Reference 2. For LLS, the actuating and reclosing Allowable Values are based on the transient event of MSIV closure with a direct scram (i.e., MSIV position switches). This analysis is described in Reference 1.

(continued)

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BASES (continued)

APPLICABILITY

The relief and LLS instrumentation is required to be OPERABLE in MODES 1, 2, and 3, since considerable energy exists in the nuclear steam system and the S/RVs may be needed to provide pressure relief. If the S/RVs are needed, then the relief and LLS functions are required to ensure that the primary containment design basis is maintained. In MODES 4 and 5, the reactor pressure is low enough that the overpressure limit cannot be approached by assumed operational transients or accidents. Thus, pressure relief, associated relief, and LLS instrumentation are not required.

ACTIONS

[Reviewer's Note: Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use the times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.]

A.1

Because the failure of any reactor steam dome pressure instrument channels [providing relief S/RV opening and LLS opening and closing pressure setpoints] in one trip system will not prevent the associated S/RV from performing its relief and LLS function, 7 days is allowed to restore a trip system to OPERABLE status. In this condition, the remaining OPERABLE trip system is adequate to perform the relief and LLS initiation function. However, the overall reliability is reduced because a single failure in the OPERABLE trip system could result in a loss of relief or LLS function.

The 7 day Completion Time is considered appropriate for the relief and LLS function because of the redundancy of sensors available to provide initiation signals and the redundancy of the relief and LLS design. In addition, the probability of multiple relief or LLS instrumentation channel failures, which renders the remaining trip system inoperable, occurring together with an event requiring the relief or LLS function during the 7 day Completion Time is very low.

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BASES

ACTIONS (continued)

B.1 and B.2

If the inoperable trip system is not restored to OPERABLE status within 7 days, per Condition A, or if two trip systems are inoperable, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

[Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.]

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains relief or LLS initiation capability, as applicable. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Ref. 3) assumption of the average time required to perform channel surveillance. That analysis demonstrated the 6 hour testing allowance does not significantly reduce the probability that the relief and LLS valves will initiate when necessary.

SR 3.3.6.5.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.5.1 (continued)

The Frequency of 92 days is based on the reliability analysis of Reference 3.

SR 3.3.6.5.2

The calibration of trip units provides a check of the actual trip setpoints. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value specified in SR 3.3.6.5.3. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.

The Frequency of 92 days is based on the reliability analysis of Reference 3.

SR 3.3.6.5.3

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

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

SR 3.3.6.5.4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed for S/RVs in LCO 3.4.4 and LCO 3.6.1.6 overlaps this Surveillance to provide complete testing of the assumed safety function.

(continued)

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.5.4 (continued)

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [5.2.2].
2. FSAR, Appendix 5A.
3. GENE-770-06-1, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," February 1991.

1. The Bases section has been deleted because the associated Specification has been deleted.

All changes are [2] unless otherwise indicated

B 3.3 INSTRUMENTATION

B 3.3.7.1 Control Room ~~Fresh Air~~ Area Filtration [1] (~~CRFA~~ CRAF [1]) System Instrumentation

BASES

BACKGROUND

The ~~CRFA~~ CRAF System is designed to provide a radiologically controlled environment to ensure the habitability of the control room for the safety of control room operators under all plant conditions. Two independent ~~CRFA~~ CRAF subsystems are each capable of fulfilling the stated safety function. The instrumentation and controls for the ~~CRFA~~ System automatically initiate action to isolate ~~or~~ and pressurize the ~~main~~ area control room ~~(MCR)~~ to minimize the consequences of radioactive material in the control room area environment.

In the event of a ~~loss of coolant accident (LOCA) signal (Reactor Vessel Water Level—Low Low, Level 2 or Drywell Pressure—High) or~~ Control Room ~~Ventilation Radiation Monitor~~ Air Intake Radiation-High signal, the ~~CRFA~~ CRAF System is automatically ~~started~~ placed in the ~~isolation~~ pressurization mode. ~~The MCR air is then recirculated through the charcoal filter, and sufficient outside air is drawn in through the normal intake to~~ INSERT BKGD-1 keep the ~~MCR~~ control room area slightly pressurized with respect to ~~the turbine building~~ surrounding areas [3].

~~The CRFA System instrumentation has two trip systems: one trip system initiates one CRFA subsystem, while the second trip system initiates the other CRFA subsystem (Ref. 1). Each trip system receives input from the Functions listed above. The Functions are arranged as follows for each trip system. The Reactor Vessel Water Level—Low Low, Level 2 and Drywell Pressure—High are arranged together in a one-out-of-two taken twice logic. The Control Room Ventilation Radiation Monitors are arranged in a two-out-of-two logic.~~ INSERT BKGD-2 The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a ~~CRFA System initiation signal to the initiation logic.~~ INSERT BKGD-3

APPLICABLE SAFETY ANALYSES, ~~LCO, and~~ APPLICABILITY [3]

The ability of the ~~CRFA~~ CRAF System to maintain the habitability of the ~~MCR~~ control room area is explicitly assumed for certain accidents as discussed in the FSAR safety analyses (Refs. 2 and 3). ~~CRFA~~ System operation ensures that the radiation exposure of [4]

(continued)

Insert BKGD-1

In this mode the normal outside air supply to the system is closed and is diverted to the emergency makeup filter train where it passes through a charcoal filter and is delivered to the suction of the control room return air fan and the suction of the auxiliary electric equipment room supply fan. Recirculated control room air is combined with the emergency makeup filter train air and delivered to the control room area via the supply fan. The addition of outside air through the emergency filter train will

Insert BKGD-2

A description of the CRAF System is provided in the Bases for LCO 3.7.4, "Control Room Area Filtration (CRAF) System."

Insert BKGD-3

The CRAF System (Ref. 1) instrumentation has 4 trip systems, two for each of the air intakes: two trip systems initiate one CRAF subsystem, while the other trip systems initiate the other CRAF subsystem. For each CRAF subsystem, the associated two trip systems are arranged in a one-out-of-two logic (i.e., either trip system can actuate the CRAF subsystem). Each trip system receives input from two Control Room Air Intake Radiation—High channels. The Control Room Air Intake Radiation—High channels are arranged in a two-out-of-two logic for each trip system. The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a CRAF System initiation signal to the initiation logic.

All changes are [2] unless otherwise indicated

BASES

APPLICABLE SAFETY ANALYSES, ~~LCO, and APPLICABILITY~~ (continued) [3]

control room personnel, through the duration of any one of the postulated accidents, does not exceed the limits set by GDC 19 of 10 CFR 50, Appendix A.

~~CRFA~~ CRAF System instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36 (c)(2)(ii).

LCO [3]

INSERT 2

~~The OPERABILITY of the CRFA System instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.7.1-1. Each Function must have a required number of OPERABLE channels, with their setpoints within the~~ specified Allowable Values~~, where appropriate~~. ~~A channel is inoperable if its actual trip setpoint is not within its required Allowable Value.~~ The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions. of SR 3.3.7.1.3 [3] [3]

Each channel must have its setpoint set within the [3]

~~Allowable Values are specified for each CRFA System Function specified in the Table.~~ Nominal trip setpoints are specified in the setpoint calculations. These nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between successive CHANNEL CALIBRATIONS. Operation with a trip setpoint that is less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. [1]

Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., ~~reactor vessel water level~~ control room air intake radiation), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined, accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

Insert LCO

(continued)

Insert 2

High radiation at the intake ducts of the control room outside air intakes is an indication of possible gross failure of the fuel cladding. The release may have originated from the primary containment due to a break in the RCPB or the refueling floor due to a fuel handling accident. When control room air intake high radiation is detected, the associated CRAF subsystem is automatically initiated in the pressurization mode since this radiation release could result in radiation exposure to control room personnel.

The Control Room Air Intake Radiation—High Function consists of eight independent monitors, with four monitors associated with one CRAF subsystem and the other four monitors associated with the other CRAF subsystem. Each of the four monitors associated with a CRAF subsystem are arranged in two trip systems, with each trip system containing two radiation monitors. Eight channels of the Control Room Air Intake Radiation—High Function are available and required to be OPERABLE to ensure no single instrument failure can preclude CRAF System initiation. The Allowable Value was selected to ensure protection of the control room personnel.

Insert LCO

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis. 1

1. Reactor Vessel Water Level—Low Low, Level 2

Low reactor pressure vessel (RPV) water level indicates that the capability to cool the fuel may be threatened. A low reactor vessel water level could indicate a LOCA, and will automatically initiate the CRFA System, since this could be a precursor to a potential radiation release and subsequent radiation exposure to control room personnel.

Reactor Vessel Water Level—Low Low, Level 2 signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level—Low Low, Level 2 Function are available (two channels per trip system) and are required to be OPERABLE to ensure that no single instrument failure can preclude CRFA System initiation. The Allowable Value for the Reactor Vessel Water Level—Low Low, Level 2 is chosen to be the same as the Secondary Containment Isolation Reactor Vessel Water Level—Low Low, Level 2 Allowable Value (LCO 3.3.6.2). 1

The Reactor Vessel Water Level—Low Low, Level 2 Function is required to be OPERABLE in MODES 1, 2, and 3, and during operations with a potential for draining the reactor vessel (OPDRVs), to ensure that the control room personnel are protected. In MODES 4 and 5, at times other than during OPDRVs, the probability of a vessel draindown event releasing radioactive material into the environment, or of a LOCA, is minimal. Therefore this Function is not required. In addition, the Control Room Ventilation Radiation Monitor Function provides adequate protection.

2. Drywell Pressure—High

High pressure in the drywell could indicate a break in the reactor coolant pressure boundary (RCPB). A high drywell pressure signal could indicate a LOCA and will automatically 1

(continued)

CRAF 1

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2. Drywell Pressure—High (continued)

initiate the CRFA System, since this could be a precursor to a potential radiation release and subsequent radiation exposure to control room personnel.

Drywell Pressure—High signals are initiated from four pressure transmitters that sense drywell pressure. Four channels of Drywell Pressure—High Function are available (two channels per trip system) and are required to be OPERABLE to ensure that no single instrument failure can preclude CRFA System initiation.

The Drywell Pressure—High Allowable Value was chosen to be the same as the Secondary Containment Isolation Drywell Pressure—High Allowable Value (LCO 3.3.6.2).

The Drywell Pressure—High Function is required to be OPERABLE in MODES 1, 2, and 3 to ensure that control room personnel are protected during a LOCA. In MODES 4 and 5, the Drywell Pressure—High Function is not required since there is insufficient energy in the reactor to pressurize the drywell to the Drywell Pressure—High setpoint.

1

3. Control Room Ventilation Radiation Monitors

The Control Room Ventilation Radiation Monitors measure radiation levels exterior to the inlet ducting of the MCR. A high radiation level may pose a threat to MCR personnel; thus, a detector indicating this condition automatically signals initiation of the CRFA System.

The Control Room Ventilation Radiation Monitors Function consists of four independent monitors. Four channels of Control Room Ventilation Radiation Monitors are available and are required to be OPERABLE to ensure that no single instrument failure can preclude CRFA System initiation. The Allowable Value was selected to ensure protection of the control room personnel.

1

APPLICABILITY 3

The Control Room ~~Ventilation~~ Air Intake Radiation ~~Monitors~~ — High Function is required to be OPERABLE in MODES 1, 2, and 3, and during CORE ALTERATIONS, OPDRVs, and movement of irradiated fuel in the secondary containment to ensure that control room personnel are protected during a LOCA, fuel handling event, 2

(continued)

BASES

3 APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY 3 (continued)

3. Control Room Ventilation Radiation Monitors (continued) 3

or a vessel draindown event. During MODES 4 and 5, when these specified conditions are not in progress (e.g., CORE ALTERATIONS), the probability of a LOCA or fuel damage is low; thus, the Function is not required.

ACTIONS

4

[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.]

A Note has been provided to modify the ACTIONS related to CREA System instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable CREA System instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable CREA System instrumentation channel.

CRAF 11

A.1

Required Action A.1 directs entry into the appropriate Condition referenced in Table 3.3.7.1-1. The applicable Condition specified in the Table is Function dependent. Each time an inoperable channel is discovered, Condition A is entered for that channel and provides for transfer to the appropriate subsequent Condition. 1

(continued)

CRAF 1

BASES

ACTIONS (continued)

B.1 and B.2

Because of the diversity of sensors available to provide initiation signals and the redundancy of the CRFA System design, an allowable out of service time of 24 hours has 25- been shown to be acceptable (Refs. 4 and 5) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function is still maintaining CRFA System initiation capability. A Function is considered to be maintaining CRFA System initiation capability when sufficient channels are OPERABLE or in trip, such that one trip system will generate an initiation signal from the given Function on a valid signal. This would require one trip system to have two channels, each OPERABLE or in trip. In this situation (loss of CRFA System initiation capability), the 24 hour allowance of Required Action B.2 is not appropriate. If the Function is not maintaining CRFA System initiation capability, the CRFA System must be declared inoperable within 1 hour of discovery of loss of CRFA System initiation capability in both trip systems. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action B.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition E must be entered and its Required Actions taken. 1

C.1 and C.2

Because of the diversity of sensors available to provide initiation signals and the redundancy of the CRFA System design, an allowable out of service time of 12 hours has been shown to be acceptable (Refs. 4 and 6) to permit restoration of any inoperable channel to OPERABLE status. 1
However, this out of service time is only acceptable provided the associated Function is still maintaining CRFA System initiation capability. A Function is considered to be maintaining CRFA System initiation capability when sufficient channels are OPERABLE or in trip, such that one

(continued)

BASES

ACTIONS

~~C.1 and C.2 (continued)~~

~~trip system will generate an initiation signal from the given Function on a valid signal. This would require one trip system to have two channels, each OPERABLE or in trip. In this situation (loss of CRFA System initiation capability), the 12 hour allowance of Required Action C.2 is not appropriate. If the Function is not maintaining CRFA System initiation capability, the CRFA System must be declared inoperable within 1 hour of discovery of loss of CRFA System initiation capability in both trip systems. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition, per Required Action C.2. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an initiation), Condition E must be entered and its Required Actions taken.~~ [1]

[1] A.1 and A.2 ~~D.1 and D.2~~

Because of the ~~diversity~~ redundancy [2] of sensors available ~~to provide initiation signals~~ and the redundancy of the ~~CRFA~~ CRAF [1] System design, an allowable out of service time of 6 hours is provided to permit restoration of any inoperable channel to OPERABLE status. ~~However, this out of service time is only acceptable provided the associated Function is still maintaining CRFA System initiation capability. A Function is considered to be maintaining CRFA System initiation capability when sufficient channels are OPERABLE or in trip, such that one trip system will generate an initiation signal from the given Function on a valid signal. This would require one trip system to have two channels, each OPERABLE or in trip. In this situation (loss of CRFA System initiation capability), the 6 hour allowance of Required Action D.2 is not appropriate. If the Function is not maintaining CRFA System initiation capability, the CRFA System must be declared inoperable within 1 hour of discovery of loss of CRFA System initiation capability in both trip systems.~~ [3] If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped

CRAF Subsystem [1]

at least

[1] A

CRAF Subsystem

CRAF subsystem [1]

[2]

Insert A.1 and A.2 # [3]

(continued)

Insert A.1 and A.2

This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." For Required Action A.1, the Completion Time only begins upon discovery that the CRAF subsystem cannot be automatically initiated due to inoperable, untripped Control Room Air Intake Radiation—High channels in both trip systems in any air intake. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoring or tripping of channels. If it is not desired to declare the CRAF subsystem inoperable, Condition B may be entered and Required Action B.1 taken.

CRAF [1]

BASES

ACTIONS

A [1] A

D.1 and D.2 (continued) [1]

A [1]

condition, per Required Action D.2. Placing the inoperable channel in trip performs the intended function of the channel (starts the associated CRFA subsystem in the isolation mode). [2] Alternately, if it is not desired to place the second channel and it is the channel in trip (e.g., as in the case where it is not desired to start the subsystem), Condition E B must be entered and its Required Actions taken. [1]

The 6 hour Completion Time is based on the consideration that this Function provides the primary signal to start the CRAF subsystem [1] ~~CRFA System~~, thus ensuring that the design basis of the ~~CRFA System~~ is met.

B [1] B

E.1 and E.2

With any Required Action CRAF [1] and associated Completion Time not met, the associated CRFA subsystem must be placed in the pressurization [2] ~~isolation~~ mode of operation (Required Action E.1 B [1]) to ensure that control room personnel will be protected in the event of a Design Basis Accident. The method used to place the CRAF [1] CRFA subsystem in operation must provide for automatically reinitiating the subsystem upon restoration of power following a loss of power to the CRAF CRFA subsystem(s). ~~As noted, if the toxic gas protection instrumentation is concurrently inoperable, then the CRFA subsystem shall be placed in the toxic gas mode instead of the isolation mode. This provides proper protection of the control room personnel if both toxic gas instrumentation (not required by Technical Specifications) and radiation instrumentation are concurrently inoperable.~~ [2] Alternately, if it is not desired to start the subsystem, the CRFA subsystem associated with inoperable, untripped channels must be declared inoperable within 1 hour.

CRAF [1]

The 1 hour Completion Time is intended to allow the operator time to place the CRFA subsystem in operation. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels, or for placing the associated CRFA subsystem in operation.

CRAF [1]

(continued)

CRAF 1

BASES (continued)

SURVEILLANCE REQUIREMENTS

~~Reviewer's Note: Certain Frequencies are based on approved topical reports. In order for a licensee to use these Frequencies, the licensee must justify the Frequencies as required by the staff SER for the topical report.~~ 4

~~As noted at the beginning of the SRs, the SRs for each CRFA System Instrumentation Function are located in the SRs column of Table 3.3.7.1-1.~~ 1

Subsystem 1 CRAF

The Surveillances are ~~also~~ modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains CRFA System initiation capability. Upon completion of the surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 4, 5, and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the CRFA System will initiate when necessary. 2

SR 3.3.7.1.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the indicated parameter for one instrument channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or 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.

(continued)

CRAF 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1.1 (continued)

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

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

SR 3.3.7.1.2

3

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

The Frequency of 92 days is based on the reliability analyses of References 4, 5, and 6. 2

~~SR 3.3.7.1.3~~

~~The calibration of trip units provides a check of the actual trip setpoints. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The channel must be declared inoperable if the trip setting is discovered to be less conservative than the Allowable Value. If the trip setting is discovered to be less conservative than accounted for in the appropriate setpoint methodology, but is not beyond the Allowable Value, the channel performance is still within the requirements of the plant safety analysis. Under these conditions, the setpoint must be readjusted to be equal to or more conservative than accounted for in the appropriate setpoint methodology.~~

~~The Frequency of 92 days is based on the reliability analyses of References 4, 5, and 6.~~ 1

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.7.1.~~7~~ 3 [1]

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based on the assumption of ~~an~~ ~~18~~ 24 [1] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.7.1.~~8~~ 4 [1]

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required initiation logic for a specific channel. The system functional testing performed in LCO 3.7.~~3~~ 4 [1], "Control Room ~~Fresh Air~~ Area Filtration [2] (~~CRFA~~ CRAF [1]) System," overlaps this Surveillance to provide complete testing of the assumed safety function.

~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the~~ While the Surveillance ~~were~~ can be performed with the reactor at power, ~~O~~operating experience has shown these components usually pass the Surveillance when performed at the ~~18~~ 24 [1] month Frequency, which is based on the refueling cycle [2]. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. [2]

REFERENCES

1. ~~FSAR, Figure [ ]~~ USAR, Sections 7.3.4 and 9.4.1 [2]
2. USAR, Section ~~[6.4]~~ [5]
3. USAR, Chapter ~~[15]~~ [5]
4. GENE-770-06-~~1~~ -A [2], "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications," ~~February 1991~~ December 1992 [2].

(continued)

BASES

REFERENCES (continued)

5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

6. NEDC-30851P-A, Supplement 2, "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989. 2

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.7.1 - CRAF SYSTEM INSTRUMENTATION

1. Changes have been made to reflect those changes made to the Specification.

2. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number reference, system description, or analysis description.

3. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

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

5. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.3 INSTRUMENTATION

B 3.3.8.1 Loss of Power (LOP) Instrumentation

BASES

BACKGROUND

Successful operation of the required safety functions of the Emergency Core Cooling Systems (ECCS) is dependent upon the availability of adequate power sources for energizing the various components such as pump motors, motor operated valves, and the associated control components. The LOP instrumentation monitors the 4.16 kV emergency buses. Offsite power is the preferred source of power for the 4.16 kV emergency buses. If the monitors determine that insufficient power is available, the buses are disconnected from the offsite power sources and connected to the onsite diesel generator (DG) power sources.

2 voltage

Each 4.16 kV emergency bus has its own independent LOP instrumentation and associated trip logic. The voltage for the Division 1, 2, and 3 buses is monitored at two levels, which can be considered as two different undervoltage functions: loss of voltage and degraded voltage.

1 INSERT B 3.3.8.1-Background

~~The LOP instrumentation comprises three Functions for Divisions 1 and 2, and two Functions for Division 3, which represent different voltage levels that cause various bus transfers and disconnects. Each Function is monitored by four undervoltage relays for each emergency bus whose outputs are arranged in a one-out-of-two taken twice logic configuration (Ref. 1). The channels include electronic equipment (e.g., trip units) that compares measured input signals with pre-established setpoints. When the setpoint is exceeded, the channel output relay actuates, which then outputs a LOP trip signal to the trip logic.~~ 1

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The LOP instrumentation is required for the Engineered Safety Features to function in any accident with a loss of offsite power. The required channels of LOP instrumentation ensure that the ECCS and other assumed systems powered from the DGs provide plant protection in the event of any of the analyzed accidents in References 2, 3, and 4 in which a loss of offsite power is assumed. The initiation of the DGs on loss of offsite power, and subsequent initiation of the

(continued)

Insert B 3.3.8.1 - Background

For Division 1 and 2, each loss of voltage and degraded voltage function is monitored by two instruments per bus whose output trip contacts are arranged in a two-out-of-two logic configuration per bus (Ref. 1). The loss of voltage signal is generated when a loss of voltage occurs for a specific time interval. Lower voltage conditions will result in decreased trip times for the inverse time undervoltage relays. The degraded voltage signal is generated when a degraded voltage occurs for a specified time interval; the time interval is dependent upon whether a loss of coolant accident signal is present. The relays utilized are inverse time delay voltage relays or instantaneous voltage relays with a time delay.

For Division 3, the degraded voltage function logic is the same as for Divisions 1 and 2, but the Division 3 loss of voltage function logic is different. The Division 3 DG will auto-start if either one of the two bus undervoltage relays (with a time delay) actuates and the DG output breaker will automatically close with the same undervoltage permissive provided that the Division 3 bus main feeder breaker is open and the DG speed and voltage permissives are met. The Division 3 bus main feed breaker trip logic includes two trip systems. Each trip system consists of an undervoltage relay on the 4.16 kV bus (with a time delay) and an undervoltage relay on the system auxiliary transformer (SAT) side of the main feed breaker to the 4.16 kV bus (with no time delay) arranged in a two-out-of-two logic. The trip setting of the SAT undervoltage relay is maintained such that it trips prior to the bus undervoltage relay. Either trip system will open (trip) the main feed breaker to the bus.

A loss of voltage signal or degraded voltage signal results in the start of the associated DG, the trip of the normal and alternate offsite power supply breakers to the associated 4.16 kV emergency bus, (for Divisions 1 and 2 only) and the shedding of the appropriate 4.16 kV bus loads.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

ECCS, ensure that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. 1

at least two of

Accident analyses credit the loading of the DG based on the loss of offsite power ~~during~~ a loss of coolant accident (LOCA). The diesel starting and loading times have been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. (S) 1

1 Coincident with

The LOP instrumentation satisfies Criterion 3 of ~~the NRC Policy Statement~~. 10 CFR 50.36(c)(2)(ii) 1

The OPERABILITY of the LOP instrumentation is dependent upon the OPERABILITY of the individual instrumentation channel Functions specified in Table 3.3.8.1-1. Each Function must have a required number of OPERABLE channels per 4.16 kV emergency bus, with their setpoints within the specified Allowable Values. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. 2 The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

The Allowable Values are specified for each Function in the Table. Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoint does not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., degraded voltage), and when the measured output value of the process parameter exceeds the setpoint, the associated device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for~~

1 INSERT ASA

(continued)

Insert ASA

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

~~channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~ 1

The specific Applicable Safety Analyses, LCO, and Applicability discussions are listed below on a Function by Function basis.

4.16 kV Emergency Bus Undervoltage

1.a, ~~1.b,~~ 2.a, 2.b. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage) 4

Loss of voltage on a 4.16 kV emergency bus indicates that offsite power may be completely lost to the respective emergency bus and is unable to supply sufficient power for proper operation of the applicable equipment. Therefore, the power supply to the bus is transferred from the offsite power to DG power. ~~when the voltage on the bus drops below the Loss of Voltage Function Allowable Values (loss of voltage with a short time delay).~~ This transfer is initiated when the voltage on the bus drops below the relay settings either with an inverse time relation that is bounded by the allowable voltage with time delay values or with an undervoltage threshold with a fixed time delay that is bounded by upper and lower Allowable Values. This ensures that adequate power will be available to the required equipment. 2 1

The Bus Undervoltage Allowable Values are low enough to prevent inadvertent power supply transfer, but high enough to ensure power is available to the required equipment. The Time Delay Allowable Values are long enough to provide time for the offsite power supply to recover to normal voltages, but short enough to ensure that power is available to the required equipment.

~~Four~~ Two channels of each 4.16 kV Emergency Bus Undervoltage (Loss of Voltage) Function per associated emergency bus are ~~only~~ required to be OPERABLE when the associated DG is required to be OPERABLE to ensure that no single instrument failure can preclude the DG function. ~~(Four channels input to each of the three DGs.)~~ Refer to LCO 3.8.1, "AC Sources—Operating," and LCO 3.8.2, "AC Sources—Shutdown," for Applicability Bases for the DGs. 1 1 1 1

1.b, 1.c, 1.d, 2.c, 2.d, 2.e. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) 4

A reduced voltage condition on a 4.16 kV emergency bus indicates that while offsite power may not be completely lost to the respective emergency bus, power may be

(continued)

For the Division 1 and 2 4.16 kV Emergency Buses, the Loss of Voltage Function is the 4.16 kV Basis and Time Delay. For the Division 3 4.16 kV Emergency Bus, the Loss of Voltage Functions are: 1) 4.16kV Basis, and 2) Time Delay. 4

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b, 4

1.c, 1.d, 2.c, 2.d, 2.e. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) (continued)

insufficient for starting large motors without risking damage to the motors that could disable the ECCS function. Therefore, power supply to the bus is transferred from offsite power to onsite DG power when the voltage on the bus drops below the Degraded Voltage Function Allowable Values (degraded voltage with a time delay). This ensures that adequate power will be available to the required equipment.

The Bus Undervoltage Allowable Values are low enough to prevent inadvertent power supply transfer, but high enough to ensure that sufficient power is available to the required equipment. The Time Delay Allowable Values are long enough to provide time for the offsite power supply to recover to normal voltages, but short enough to ensure that sufficient power is available to the required equipment.

1 Two

each 1

4 The Degraded Voltage Functions are: 1) 4.16 kV Basis; 2) Time Delay, No LOCA; and 3) Time Delay, LOCA.

Four channels of 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) Function per associated emergency bus are only required to be OPERABLE when the associated DG is required to be OPERABLE to ensure that no single instrument failure can preclude the DG function. ~~Four channels input to each of the three DGs.~~ 1 Refer to LCO 3.8.1 and LCO 3.8.2 for Applicability Bases for the DGs.

1

ACTIONS

A Note has been provided to modify the ACTIONS related to LOP instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable LOP instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable LOP instrumentation channel.

(continued)

BASES

ACTIONS (continued)

A.1

With one or more channels of a Function inoperable, the Function may not be capable of performing the intended function. Therefore, only 1 hour is allowed to restore the inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the channel in trip would result in a DG initiation), Condition B must be entered and its Required Action taken.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

B.1

If any Required Action and associated Completion Time is not met, the associated Function may not be capable of performing the intended function. Therefore, the associated DG(s) are declared inoperable immediately. This requires entry into applicable Conditions and Required Actions of LCO 3.8.1 and LCO 3.8.2, which provide appropriate actions for the inoperable DG(s).

SURVEILLANCE REQUIREMENTS

LOP Initiation capability is maintained provided the associated Function can perform the load shed and control scheme for two of the three 4.16 kV emergency buses. 1

As noted at the beginning of the SRs, the SRs for each LOP Instrumentation Function are located in the SRs column of Table 3.3.8.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 2 hours provided the associated Function maintains ~~DG~~ LOP 4 initiation capability. Upon completion of the Surveillance,

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

or expiration of the 2 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

SR 3.3.8.1.1 — 4

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

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

SR 3.3.8.1.~~2~~ 1 — 4

2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the ~~entire~~ channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

24 months — 4

The Frequency of ~~31 days~~ is based on plant operating experience with regard to channel OPERABILITY and drift that demonstrates that failure of more than one channel of a given Function in any ~~31 day~~ interval is rare.

24 month — 4

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.1.~~5~~ 2 4

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

2 ~~Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.~~

The Frequency is based on the assumption of ~~an~~ ~~[18]~~ 24 4 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.1.~~6~~ 3 4

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required actuation logic for a specific channel. The system functional testing performed in LCO 3.8.1 and LCO 3.8.2 overlaps this Surveillance to provide complete testing of the assumed safety functions.

4 24 The ~~18~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the ~~18~~ 24 4 month Frequency.

REFERENCES 1 U

1. FSAR, ~~Figure [ ]~~ 8.2.3.3 5
2. FSAR, Section ~~[~~5.2~~]~~ .2 5

1 U

3. FSAR, Section ~~[~~6.3~~]~~.
4. FSAR, Chapter ~~[~~15~~]~~. 5

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.8.1 - LOSS OF POWER INSTRUMENTATION

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number, reference, system description, or analysis description.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. Changes have been made to more closely reflect the Specification requirements.

4. Changes have been made to reflect those changes made to the Specification. The following requirements have been renumbered, where applicable, to reflect the changes.

5. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.3 INSTRUMENTATION

B 3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

BASES

BACKGROUND

The RPS Electric Power Monitoring System is provided to isolate the RPS bus from the motor generator (MG) set or ~~an~~ the [1] alternate power supply in the event of overvoltage, undervoltage, or underfrequency. This system protects the loads connected to the RPS bus against unacceptable voltage and frequency conditions (Ref. 1) and forms an important part of the primary success path for the essential safety circuits. Some of the essential equipment powered from the RPS buses includes the RPS logic, scram solenoids, and various valve isolation logic.

The RPS Electric Power Monitoring assembly will detect any abnormal high or low voltage or low frequency condition in the outputs of the two MG sets or the alternate power supply and will de-energize its respective RPS bus, thereby causing all safety functions normally powered by this bus to de-energize.

In the event of failure of an RPS Electric Power Monitoring System (e.g., both inseries electric power monitoring assemblies), the RPS loads may experience significant effects from the unregulated power supply. Deviation from the nominal conditions can potentially cause damage to the scram and MSIV trip [1] solenoids and other Class 1E devices.

In the event of a low voltage condition, for an extended period of time, the scram and MSIV trip [1] solenoids can chatter and potentially lose their pneumatic control capability, resulting in a loss of primary scram and MSIV closure [1] action.

In the event of an overvoltage condition, the RPS logic and isolation [1] relays and scram solenoids, as well as the main steam isolation valve trip [1] solenoids, may experience a voltage higher than their design voltage. If the overvoltage condition persists for an extended time period, it may cause equipment degradation and the loss of plant safety function.

Two redundant Class 1E circuit breakers are connected in series between each RPS bus and its MG set, and between each RPS bus and ~~its~~ the [1] alternate power supply. Each of these

(continued)

BASES

BACKGROUND (continued)

circuit breakers has an associated independent set of Class 1E overvoltage, undervoltage, and underfrequency sensing logic. Together, a circuit breaker and its sensing logic constitute an electric power monitoring assembly. If the output of the MG set [or alternate power supply] [1] exceeds the predetermined limits of overvoltage, undervoltage, or underfrequency, a trip coil driven by this logic circuitry opens the circuit breaker, which removes the associated [inservice] [2] power supply from service.

APPLICABLE SAFETY ANALYSES

RPS ~~e~~lectric ~~p~~ower ~~m~~onitoring is necessary to meet the assumptions of the safety analyses by ensuring that the equipment powered from the RPS buses can perform its intended function. RPS ~~e~~lectric ~~p~~ower ~~m~~onitoring provides protection to the RPS and other systems that receive power from the RPS buses, by disconnecting the RPS from the power supply under specified conditions that could damage the RPS bus powered equipment.

RPS ~~e~~lectric ~~p~~ower ~~m~~onitoring satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10CFR50.36(c)(2)(ii). [1]

LCO

The OPERABILITY of each RPS electric power monitoring assembly is dependent upon the OPERABILITY of the overvoltage, undervoltage, and underfrequency logic, as well as the OPERABILITY of the associated circuit breaker. Two electric power monitoring assemblies are required to be OPERABLE for each inservice power supply. This provides redundant protection against any abnormal voltage or frequency conditions to ensure that no single RPS electric power monitoring assembly failure can preclude the function of RPS bus powered components. Each [of the] inservice electric power monitoring assembly~~'s~~ trip logic setpoints ~~are~~ is required to be within the specific Allowable Value. [2] The actual setpoint is calibrated consistent with applicable setpoint methodology assumptions.

Allowable Values are specified for each RPS electric power monitoring assembly trip logic (refer to SR 3.3.8.2.2). Nominal trip setpoints are specified in the setpoint calculations. The nominal setpoints are selected to ensure that the setpoints do not exceed the Allowable Value between CHANNEL CALIBRATIONS. Operation with a trip setpoint less

(continued)

BASES

LCO (continued)

conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. Trip setpoints are those predetermined values of output at which an action should take place. The setpoints are compared to the actual process parameter (e.g., overvoltage), and when the measured output value of the process parameter exceeds the setpoint, the associated

[1] coil

device (e.g., trip unit) changes state. The analytic limits are derived from the limiting values of the process parameters obtained from the safety analysis. ~~The Allowable Values are derived from the analytic limits, corrected for calibration, process, and some of the instrument errors. The trip setpoints are then determined, accounting for the remaining instrument errors (e.g., drift). The trip setpoints derived in this manner provide adequate protection because instrumentation uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for.~~

[1] INSERT LCO

The Allowable Values for the and instrument settings are based on the RPS providing ≥ 57 Hz, 120 V ± 10%. ~~(to all equipment), and 115 V ± 10 V (to scram and MSIV solenoids).~~ [2] The most limiting voltage requirement and associated line losses determine the settings of the electric power monitoring instrument channels. The settings are calculated based on the loads on the buses and RPS MG set or alternate power supply being 120 VAC and 60 Hz.

APPLICABILITY

The operation of the RPS electric power monitoring assemblies is essential to disconnect the RPS bus powered components from the inservice MG set or alternate power supply during abnormal voltage or frequency conditions. Since the degradation of a nonclass 1E source supplying power to the RPS bus can occur as a result of any random single failure, the OPERABILITY of the RPS electric power monitoring assemblies is required when the RPS bus powered components are required to be OPERABLE. This results in the RPS Electric Power Monitoring System OPERABILITY being required in MODES 1, 2, and 3, ~~and MODES 4 and 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies or with both residual heat removal (RHR) shutdown cooling isolation valves open~~. [3]

MODES

(continued)

, during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, and during operations with a potential for draining the reactor vessel (OPDRVs) [3]

Insert LCO

The trip setpoints are determined from the analytic limits, corrected for defined process, calibration, and instrument errors. The Allowable Values are then determined, based on the trip setpoint values, by accounting for the calibration based errors. These calibration based errors are limited to reference accuracy, instrument drift, errors associated with measurement and test equipment, and calibration tolerance of loop components. The trip setpoints and Allowable Values determined in this manner provide adequate protection because instrument uncertainties, process effects, calibration tolerances, instrument drift, and severe environment errors (for channels that must function in harsh environments as defined by 10 CFR 50.49) are accounted for and appropriately applied for the instrumentation.

BASES (continued)

ACTIONS

A.1

If one RPS electric power monitoring assembly for an inservice power supply (MG set or alternate) is inoperable, or one RPS electric power monitoring assembly on each inservice power supply is inoperable, the OPERABLE assembly will still provide protection to the RPS bus powered components under degraded voltage or frequency conditions. However, the reliability and redundancy of the RPS Electric Power Monitoring System are reduced and only a limited time (72 hours) is allowed to restore the inoperable assembly(s) to OPERABLE status. If the inoperable assembly(s) cannot be restored to OPERABLE status, the associated power supply must be removed from service (Required Action A.1). This places the RPS bus in a safe condition. An alternate power supply with OPERABLE power monitoring assemblies may then be used to power the RPS bus.

The 72 hour Completion Time takes into account the remaining OPERABLE electric power monitoring assembly and the low probability of an event requiring RPS Electric Power Monitoring protection occurring during this period. It allows time for plant operations personnel to take corrective actions or to place the plant in the required condition in an orderly manner and without challenging plant systems.

Alternatively, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C ~~or~~ , D, E, or F, as applicable, must be entered and its Required Actions taken. $\boxed{3}$

B.1

If both power monitoring assemblies for an inservice power supply (MG set or alternate) are inoperable, or both power monitoring assemblies in each inservice power supply are inoperable, the system protective function is lost. In this condition, 1 hour is allowed to restore one assembly to OPERABLE status for each inservice power supply. If one inoperable assembly for each inservice power supply cannot be restored to OPERABLE status, the associated power supplies must be removed from service within 1 hour (Required Action B.1). An alternate power supply with

(continued)

BASES

ACTIONS

B.1 (continued)

OPERABLE assemblies may then be used to power one RPS bus. The 1 hour Completion Time is sufficient for the plant operations personnel to take corrective actions and is acceptable because it minimizes risk while allowing time for restoration or removal from service of the electric power monitoring assemblies.

Alternately, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C ~~or~~ D, as applicable, must be entered and its Required Actions taken. , ,E, or F 3

C.1 and C.2

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 1, 2, or 3, a plant shutdown must be performed. This places the plant in a condition where minimal equipment, powered through the inoperable RPS electric power monitoring assembly(s), is required and ensures that the safety function of the RPS bus loads 2 (e.g., scram of control rods) is not required. The plant shutdown is accomplished by placing the plant in MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1 ~~(D.2.1)~~ and D.2 3

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 4 or 5, ~~with any control rod withdrawn from a core cell containing one or more fuel assemblies~~ or with ~~both~~ RHR ~~shutdown cooling~~ SDC isolation valves open, the operator must immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies (Required Action E.1). This Required Action results in the least reactive condition for the reactor core and ensures that the safety function of the RPS (e.g., scram of control rods) is not required. 3

INSERT E.1
MOVE TO
PAGE B 3.3-245

(continued)

BASES

ACTIONS

E.1
If any Required Action and associated Completion Time of Condition A or B are not met in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies,
INSERT E.1 from page B 3.3-244

D.1, D.2.1, and D.2.2 (continued)

In addition, action must be immediately initiated to either restore one electric power monitoring assembly to OPERABLE status for the inservice power source supplying the required instrumentation powered from the RPS bus (Required Action D.2.1) or to isolate the RHR Shutdown Cooling System (Required Action D.2.2). Required Action D.2.1 is provided because the RHR Shutdown Cooling System may be needed to provide core cooling. All actions must continue until the applicable Required Actions are completed.

SDC

3

INSERT ACTION F

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency channel to ensure that the ~~entire~~ channel will perform the intended function. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

2

As noted in the Surveillance, the CHANNEL FUNCTIONAL TEST is only required to be performed while the plant is in a condition in which the loss of the RPS bus will not jeopardize steady state power operation (the design of the system is such that the power source must be removed from service to conduct the Surveillance). The 24 hours is intended to indicate an outage of sufficient duration to allow for scheduling and proper performance of the Surveillance. The 184 day Frequency and the Note in the Surveillance are based on guidance provided in Generic Letter 91-09 (Ref. 2).

SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

(continued)

Insert ACTION F

F.1.1, F.1.2, F.2.1, and F.2.2

If any Required Action and associated Completion Time of Condition A or B are not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs, the ability to isolate the secondary containment and start the Standby Gas Treatment (SGT) System cannot be ensured. Therefore, actions must be immediately performed to ensure the ability to maintain the secondary containment and SGT System functions. Isolating the affected penetration flow path(s) and starting the associated SGT subsystem(s) (Required Actions F.1.1 and F.2.1) performs the intended function of the instrumentation the RPS electric power monitoring assemblies is protecting, and allows operations to continue.

Alternatively, immediately declaring the associated secondary containment isolation valve(s) or SGT subsystem(s) inoperable (Required Action F.1.2 and F.2.2) is also acceptable since the Required Actions of the respective LCOs (LCO 3.6.4.2 and LCO 3.6.4.3) provide appropriate actions for the inoperable components.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2.2 (continued)

24 3

The Frequency is based upon the assumption of an ~~18~~ month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.2.3

that, with 2

1 The system functional test shall include actuation of the protective relays, tripping logic, and output circuit breakers.

Performance of a system functional test demonstrates ~~a~~ required system actuation (simulated or actual) signal. ~~The~~ logic of the system will automatically trip open the associated power monitoring assembly circuit breaker. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

3 24

The ~~18~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the ~~18~~ month Frequency.

24 3

REFERENCES

U 1

3 5

1. FSAR, Section ~~[~~8.3.1.1.~~5]~~.
2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electric Protective Assemblies in Power Supplies for the Reactor Protection System."

JUSTIFICATION FOR DEVIATIONS FROM NUREG-1434, REVISION 1
ITS BASES: 3.3.8.2 - RPS ELECTRICAL POWER MONITORING

1. Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific methodology, nomenclature, number reference, system description, or analysis description.

2. Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

3. Changes have been made to reflect those changes made to the Specification.

4. Not used.

5. The brackets have been removed and the proper plant specific information/value has been provided.

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

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

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

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

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

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

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

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

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

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

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

   The proposed change relocates requirements and surveillances for structures, systems, components or variables that do not meet the criteria for inclusion in Technical Specifications as identified in the Application of Selection Criteria to the LaSalle 1 and 2 Technical Specifications. The affected structures, systems, components or variables are not assumed to be initiators of analyzed events and are not assumed to mitigate accident or transient events. The requirements and surveillances for these affected structures, systems, components or variables will be relocated from the Technical Specifications to an appropriate administratively controlled document which will be maintained pursuant to 10 CFR 50.59. In addition, the affected structures, systems, components or variables are addressed in existing surveillance procedures which are also controlled by 10 CFR 50.59 and subject to the change control provisions imposed by plant administrative procedures, which endorse applicable regulations and standards. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

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

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

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

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

3. (continued)

The existing requirement for NRC review and approval of revisions, in accordance with 10 CFR 50.92, to these details proposed for relocation does not have a specific margin of safety upon which to evaluate. However, since the proposed change is consistent with the BWR Standard Technical Specification, NUREG-1434, Rev. 1, approved by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail ensures no significant reduction in the margin of safety.

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

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

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

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

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

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

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

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

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

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

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

   The proposed change relocates certain details from the Technical Specifications to the Bases, UFSAR, TRM, or other plant controlled documents. The Bases, UFSAR, TRM, and other plant controlled documents containing the relocated information will be maintained in accordance with 10 CFR 50.59. In addition to 10 CFR 50.59 provisions, the Technical Specification Bases are subject to the change control provisions in the Administrative Controls Chapter of the ITS. The UFSAR is subject to the change control provisions of 10 CFR 50.71(e), and the plant procedures and other plant controlled documents are subject to controls imposed by plant administrative procedures, which endorse applicable regulations and standards. Since any changes to the Bases, UFSAR, TRM, or other plant controlled documents will be evaluated per the requirements of the Bases Control Program in Chapter 5.0 of the ITS or 10 CFR 50.59, no increase (significant or insignificant) in the probability or consequences of an accident previously evaluated will be allowed. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

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

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

   The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the details to be transposed from the Technical Specifications to the Bases, UFSAR, TRM, or other plant controlled

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

3. (continued)

documents are the same as the existing Technical Specifications. Since any future changes to these details in the Bases, UFSAR, TRM, or other plant controlled documents will be evaluated per the requirements of 10 CFR 50.59, no reduction (significant or insignificant) in a margin of safety will be allowed. Based on 10 CFR 50.92, the existing requirement for NRC review and approval of revisions, to these details proposed for relocation, does not have a specific margin of safety upon which to evaluate. However, since the proposed change is consistent with the BWR Standard Technical Specifications, NUREG-1434, Rev. 1, approved by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail ensures no significant reduction in the margin of safety.

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING INSTRUMENTATION STIs AND AOTs
("LB.x" Labeled Comments/Discussions)

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

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

   The proposed changes increase the Surveillance Test Intervals (STIs) and Allowed Out-of-Service Times (AOTs) for instrumentation supporting a number of TS functions. There are no related modifications to any of the affected systems. However, the changes are expected to reduce the test-related plant scrams and test-induced wear on the equipment. Therefore, there is no significant increase in the probability of occurrence of a previously evaluated accident.

   General Electric Topical Reports NEDC-30936-P-A, NEDC-31677-P-A, GENE-770-06-1-A, and GENE-770-06-02-A show that the effects of these extensions of STIs and AOTs, which produced negligible impact, are bounded by previous analyses. Furthermore, the NRC has reviewed these reports and approved the conclusions on a generic basis. Therefore, the change does not significantly increase the consequences of a previously evaluated accident.

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

   The design and functional operation of the affected equipment are not changed by the proposed revisions. The proposed changes affect only the STIs and AOTs and will not impact the function of monitoring system variables over the anticipated ranges for normal operation, anticipated operational occurrences, or accident conditions. Furthermore, the proposed changes do not introduce any new modes of plant operation, make any physical modifications, or alter any operational setpoints. Therefore, the possibility of a new or different kind of accident from any previously evaluated is not created.

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

   The proposed changes do not alter the manner in which Safety Limits, Limiting Safety System Settings, or Limiting Conditions for Operation are determined. Reduced testing, other than as addressed above, allows a longer time interval over which instrument uncertainties (e.g., drift) may act. The current affected instrumentation

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING INSTRUMENTATION STIs AND AOTs
("LB.x" Labeled Comments/Discussions)

3. (continued)

setpoints account for the effects of drift and include a sufficient allowance to tolerate extensions of the STIs. Implementation of the proposed changes is expected to result in an overall improvement in safety, because:

a. Reduced testing will result in fewer inadvertent reactor trips, less frequent actuation of ESF components, and greater equipment availability.

b. Reduced testing will result in less distractions of the operating staff from monitoring and controlling plant operations, thereby increasing the effectiveness of the operating staff.

Therefore, the proposed changes do not significantly reduce the margin of safety.

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING SURVEILLANCE FREQUENCIES FROM 18 MONTHS TO 24 MONTHS FOR SURVEILLANCES OTHER THAN CHANNEL CALIBRATIONS
("LD.x" Labeled Comments/Discussions)

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

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

   The proposed change involves a change in the surveillance testing intervals from 18 months to 24 months. The proposed change does not physically impact the plant nor does it impact any design or functional requirements of the associated systems. That is, the proposed change does not degrade the performance or increase the challenges of any safety systems assumed to function in the accident analysis. The proposed change does not impact the Surveillance Requirements themselves nor the way in which the Surveillances are performed. Additionally, the proposed change does not introduce any new accident initiators since no accidents previously evaluated have as their initiators anything related to the frequency of surveillance testing. The proposed change does not affect the availability of equipment or systems required to mitigate the consequences of an accident because of the availability of redundant systems or equipment and because other tests performed more frequently will identify potential equipment problems. Furthermore, an historical review of surveillance test results indicated that all failures identified were unique, non-repetitive, and not related to any time-based failure modes, and indicated no evidence of any failures that would invalidate the above conclusions. Therefore, the proposed change does not increase the probability or consequences of an accident previously evaluated.

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

   The proposed change involves a change in the surveillance testing intervals from 18 months to 24 months. The proposed change does not introduce any failure mechanisms of a different type than those previously evaluated since there are no physical changes being made to the facility. In addition, the Surveillance Requirements themselves and the way Surveillances are performed will remain unchanged. Furthermore, an historical review of surveillance test results indicated no evidence of any failures that would invalidate the above conclusions. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING SURVEILLANCE FREQUENCIES FROM 18 MONTHS TO 24 MONTHS FOR SURVEILLANCES OTHER THAN CHANNEL CALIBRATIONS
("LD.x" Labeled Comments/Discussions) (continued)

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

   Although the proposed change will result in an increase in the interval between surveillance tests, the impact on system availability is minimal based on other, more frequent testing or redundant systems or equipment, and there is no evidence of any failures that would impact the availability of the systems. Therefore, the assumptions in the licensing basis are not impacted, and the proposed change does not involve a significant reduction in a margin of safety.

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING SURVEILLANCE FREQUENCIES FROM 18 MONTHS TO 24 MONTHS FOR CHANNEL CALIBRATION SURVEILLANCES
("LE.x" Labeled Comments/Discussions)

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

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

   The proposed change involves a change in the instrumentation channel calibration surveillance testing intervals to 24 months. The proposed change does not physically impact the plant nor does it impact any design or functional requirements of the associated systems. That is, the proposed change does not degrade the performance or increase the challenges of any safety systems assumed to function in the accident analysis. The proposed change does not impact the Surveillance Requirements themselves nor the way in which the Surveillances are performed. Additionally, the proposed change does not introduce any new accident initiators since no accidents previously evaluated have as their initiators anything related to the frequency of surveillance testing. The proposed change does not affect the availability of equipment or systems required to mitigate the consequences of an accident because of the availability of redundant systems or equipment and because other test performed more frequently will identify potential equipment problems. Furthermore, an historical review of surveillance test results indicated that all failures identified were unique, non-repetitive, and not related to any time-based failure modes, and indicated no evidence of any failures that would invalidate the above conclusions. Therefore, the proposed change does not increase the probability or consequences of an accident previously evaluated.

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

   The proposed change involves a change in the instrumentation channel calibration surveillance testing intervals to 24 months. The proposed change does not introduce any failure mechanisms of a different type than those previously evaluated since there are no physical changes being made to the facility. In addition, the Surveillance Requirements themselves and the way Surveillances are performed will remain unchanged. Furthermore, an historical review of surveillance test results indicated no evidence of any failures that would invalidate the above conclusions. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

"GENERIC" LESS RESTRICTIVE CHANGES:
EXTENDING SURVEILLANCE FREQUENCIES FROM 18 MONTHS TO 24 MONTHS FOR CHANNEL CALIBRATION SURVEILLANCES
("LE.x" Labeled Comments/Discussions) (continued)

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

Although the proposed change will result in an increase in the interval between surveillance tests, the impact on system availability is small based on other, more frequent testing or redundant systems or equipment, and there is no evidence of any failures that would impact the availability of the systems. Therefore, the assumptions in the licensing basis are not impacted, and the proposed change does not involve a significant reduction in a margin of safety.

GENERIC LESS RESTRICTIVE CHANGES: CHANGING INSTRUMENTATION ALLOWABLE VALUES ("LF.x" Labeled Comments/Discussions)

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

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

   The proposed changes in selected Allowable Values for the instrumentation included in proposed Section 3.3 of the Technical Specifications are the result of application of the ComEd Instrumentation Setpoint Methodology. This methodology incorporates the guidance of ANSI/ISA S67.04-Part I-1994 and RP67.04-Part II-1994. Application of this methodology results in instrumentation selected Allowable Values which more accurately reflect total instrumentation loop accuracy as well as that of test equipment and setpoint drift between Surveillances. The proposed changes will not result in any hardware changes. The instrumentation included in proposed Section 3.3 of the Technical Specifications is not assumed to be an initiator of any analyzed event. Existing operating margin between plant conditions and actual plant setpoints is not significantly reduced due to this change. As a result, the proposed changes will not result in unnecessary plant transients.

   The role of the proposed Section 3.3 instrumentation is in mitigating and thereby limiting the consequences of accidents. The Allowable Values have been developed to ensure that the design and safety analysis limits will be satisfied. The methodology used for the development of the Allowable Values ensures the affected instrumentation remains capable of mitigating design basis events as described in the safety analyses and that the results and consequences described in the safety analyses remain bounding. Additionally, the proposed change does not alter the plant's ability to detect and mitigate events. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed changes are the result of application of the Instrumentation Setpoint Methodology and do not create the possibility of a new or different kind of accident from any accident previously evaluated. This is based on the fact that the method and manner of plant operation is unchanged. The use of the proposed Allowable Values does not impact safe operation of the plant, in that, the safety analysis limits will be

GENERIC LESS RESTRICTIVE CHANGES:
CHANGING INSTRUMENTATION ALLOWABLE VALUES
("LF.x" Labeled Comments/Discussions)

2. (continued)

maintained. The proposed Allowable Values involve no system additions or physical modifications to plant systems. These Allowable Values were developed using a methodology to ensure the affected instrumentation remains capable of mitigating accidents and transients. Plant equipment will not be operated in a manner different from previous operation, except that setpoints may be changed. Since operational methods remain unchanged and the operating parameters have been evaluated to maintain the station within existing design basis criteria, no different type of failure or accident is created.

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

The proposed change does not involve a reduction in a margin of safety. The proposed changes have been developed using a methodology to ensure safety analysis limits are not exceeded. As such, this proposed change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.1.1 - RPS INSTRUMENTATION

L.1 CHANGE

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

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

   This change will remove normal operation requirements for OPERABILITY of the IRM Neutron Flux—High, IRM Inoperative, Reactor Mode Switch Shutdown Position, and Manual Scram RPS Functions in MODES 3 and 4. Control rod withdrawal is not allowed in these conditions and the RPS scram function serves no purpose. These RPS Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this change does not impact the capability of the system to perform its required function since the control rods are already inserted. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since other requirements prevent the withdrawal of control rods in these modes, thus making the RPS scram Functions unnecessary.

L.2 CHANGE

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

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

   This change will remove requirements for OPERABILITY of the IRM Neutron Flux—High, IRM Inoperative, Reactor Mode Switch Shutdown Position, and Manual Scram RPS Functions in MODE 5 with no control rods withdrawn from fueled core cells. Control rods are fully inserted in these conditions and the RPS scram function serves no purpose. These RPS Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this change does not impact the capability of the system to perform its required function since all control rods in core cells with fuel assemblies are inserted. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since other requirements control the withdrawal of control rods in these modes, thus making the RPS scram Functions unnecessary.

L.3 CHANGE

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

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

   This change will remove normal operation requirements for OPERABILITY of the APRM Neutron Flux—High, Setdown and APRM Inoperative Functions in MODE 3. Control rod withdrawal is not allowed in these conditions and the RPS Functions serve no purpose. These RPS Functions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this change does not impact the capability of the system to perform its required function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since other requirements prevent the removal of control rods in these modes, thus making the RPS scram Functions unnecessary.

L.4 CHANGE

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

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

   This change will reduce the applicable conditions for the RPS APRM scrams during MODE 5 to only during SDM demonstrations. The APRM scram is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this function is not credited for mitigation of any accident in the omitted conditions. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the function is not credited in the omitted applicable conditions and at least two other flux monitors (IRMs) are available to provide the required protection.

L.5 CHANGE

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

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

   This change eliminates a special Surveillance Frequency to perform the CHANNEL FUNCTIONAL TEST on the APRM Flow Biased Simulated Thermal Power — Upscale Function and the APRM Fixed Neutron Flux — High Function within 24 hours prior to a startup, if not performed in the previous 7 days. The affected RPS Functions are not considered as initiators for any accidents previously analyzed. The consequences of an accident are not affected by eliminating the special Frequency of the Surveillance since operating history has shown that these RPS Functions would be continually reliable during the normal periodic Frequency of 92 days. Additionally, the most common outcome of the performance of a Surveillance is the successful demonstration that the acceptance criteria are satisfied. This change does not alter assumptions relative to the mitigation of an accident or transient event. Therefore, this change does not involve a significant increase in the probability or consequences of a previously analyzed accident.

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

   The change introduces no new mode of plant operation and it does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed change to the Frequency is acceptable since the normal 92 day Frequency is adequate for ensuring the RPS Functions are maintained OPERABLE. Also, this change is considered acceptable since the most common outcome of the performance of a Surveillance is the successful demonstration that the acceptance criteria are satisfied. In addition, the proposed change provides the benefit of increasing overall reliability of the affected RPS Functions by eliminating unnecessary testing which increases wear on the affected instruments. The safety analysis assumptions will still be maintained, thus, no question of safety exists. Therefore, this change does not involve a significant reduction in a margin of safety.

L.6 CHANGE

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

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

   This change will remove requirements for OPERABILITY of the Scram Discharge Volume Water Level—High RPS Function in MODE 5 unless a control rod is withdrawn from a core cell containing fuel assemblies. Control rod withdrawal from or insertion into core cells without fuel assemblies does not significantly affect core reactivity and therefore, the RPS scram function serves no purpose. The affected RPS Function is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this change does not impact the capability of the system to perform its required function, i.e., insert withdrawn control rods, since all control rods in core cells with fuel assemblies are already inserted. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the requirements continue to provide OPERABILITY of the Scram Discharge Volume Water Level—High RPS Function under all of the conditions in which it may be required.

L.7 CHANGE

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

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

   The RPS Instrumentation is not assumed to be an initiator of any analyzed event. The change will not allow continuous operation such that a single failure will preclude the affected RPS Function from being performed. This change deletes the requirement to initiate a power reduction within 15 minutes when a channel is inoperable greater than the allowed outage time. The requirement to reduce power to below 25% RTP (the power at which the RPS Functions are no longer applicable) is unchanged. Deletion of the 15 minute requirement provides time to perform an orderly reduction in power in a controlled manner. The consequences of an accident are unchanged, since this change does not affect the time to reach 25% RTP. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The possibility of a new or different kind of accident from any accident previously evaluated is not created because the proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant.

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

   No reduction in a margin of safety is involved since this change does not affect the time allowed for operation with the RPS channels inoperable. Additionally, the 15 minute action initiation time is not an assumption of a design basis accident or transient analysis.

L.8 CHANGE

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

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

   The RPS Instrumentation is not assumed to be an initiator of any analyzed event. The change will not allow continuous operation such that a single failure will preclude the affected RPS Function from being performed. This change allows an additional 2 hours to reach 25% RTP, which provides a reasonable amount of time to perform an orderly decrease in power, thus further minimizing a potential upset from a too rapid decrease in plant power. Additionally, the consequences of an event occurring while the unit is decreasing power during the extra time is the same as the consequences of an event occurring for the current time. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The possibility of a new or different kind of accident from any accident previously evaluated is not created because the proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant.

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

   The increased time allowed for reaching the applicable condition with inoperable RPS channels is acceptable based on the small probability of an event requiring the inoperable channels to function and the minimization of plant transients. The requested extension will provide sufficient time for the unit to reach the applicable condition in an orderly manner. As a result, the potential for human error will be reduced. As such, any reduction in a margin of safety will be insignificant and offset by the benefit gained from providing sufficient time to reach the applicable condition, thus avoiding potential plant transients from attempting to reach the applicable condition in the current time.

L.9 CHANGE

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

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

   The APRM RPS instrumentation is not assumed in the initiation of any analyzed event. The role of this instrumentation is in mitigating and, thereby, limiting the consequences of analyzed events. The proposed change effectively extends the initial Surveillance Frequency until 12 hours after THERMAL POWER is ≥ 25% RTP. This allows time after the appropriate conditions are established to perform the Surveillance. The Surveillance is not required to be performed below 25% RTP because it is difficult to accurately determine core THERMAL POWER from a heat balance at these low power levels. In addition, at low power levels, a high degree of accuracy between the APRM indication and actual core THERMAL POWER is unnecessary due to the large inherent margin to the thermal limits at these power levels. As a result, the consequences of an accident are not affected by this change. This change will not alter assumptions relative to the mitigation of an accident or transient event. Therefore, this changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The margin of safety is not reduced by this change since the proposed change to the Surveillance Frequency provides the necessary assurance that the APRM instrumentation has been accurately calibrated at an early opportunity. This change extends the initial performance of the Surveillance Requirement to within 12 hours after reaching 25% RTP. This is considered acceptable since below 25% RTP a high degree of accuracy between the APRM indication and actual core THERMAL POWER is unnecessary due to the large inherent margin to the thermal limits at these power levels. In addition, this change provides the benefit of allowing the Surveillance to be

L.9 CHANGE

3. (continued)

postponed until appropriate plant conditions exist for performing the Surveillance accurately. The safety analysis assumptions will still be maintained, thus no question of safety exists. Therefore, this change does not involve a significant reduction in a margin of safety.

L.10 CHANGE

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

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

   Reactor power is not considered as an initiator of any analyzed event. In addition, neither the failure to post a notice concerning the APRM gains, nor the APRM gains themselves are considered as an initiator of any analyzed event. While the initial power level is assumed as an initial condition of many accidents, this change will not affect the requirement to maintain power level within the assumptions of the accident analysis. The Operating License will continue to require that the unit not exceed 100% of RTP. Therefore, the proposed change does not significantly increase the probability or consequences of a previously evaluated accident.

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

   The proposed change introduces no new mode of plant operation nor does it require physical modification to the plant. Therefore, the change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change has no impact on any safety analysis assumption since the requirement to maintain power less than or equal to 100% RTP, as specified in the Operating License, is unchanged. In addition, failure to post a notice that the APRM gains must be adjusted will not increase the potential for exceeding 100% RTP. Therefore, the change does not involve a significant reduction in a margin of safety.

L.11 CHANGE

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

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

   The proposed change excludes RPS RESPONSE TIME testing for the RPS APRM Flow Biased Simulated Thermal Power—Upscale Function. The probability of an accident is not increased by this change because the proposed change does not involve any physical changes to plant systems, structures, or components (SSCs), or the manner in which these SSCs are operated, maintained, or modified. The consequences of an accident will not be increased because this Function is not credited in any accident or transient analyses. The Function excluded is the APRM Flow Biased Simulated Thermal Power —Upscale Function. This change is acceptable since the OPERABILITY of the channels associated with this Function will still be confirmed during the performance of a LOGIC SYSTEM FUNCTIONAL TEST, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   This proposed change will not involve any physical changes to plant SSCs, or the manner in which these SSCs are operated, maintained, modified, or inspected. The proposed change still provides adequate assurance the RPS Functions remain capable of performing their function, as assumed in the safety analyses. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed change excludes RPS RESPONSE TIME testing for the RPS APRM Flow Biased Simulated Thermal Power—Upscale Function. The proposed change does not involve a significant reduction in a margin of safety because this Function is not credited in any accident or transient analyses. The Function excluded is the APRM Flow Biased Simulated Thermal Power—Upscale Function. This change is acceptable since the OPERABILITY of the channels associated with this Function will still be

L.11 CHANGE

3. (continued)

confirmed during the performance of a LOGIC SYSTEM FUNCTIONAL TEST, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION. The change does not affect the current analysis assumptions and adequate assurance is provided that the RPS Functions will be maintained OPERABLE. Therefore, this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.1.2 - SRM INSTRUMENTATION

L.1 CHANGE

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

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

   This change will allow short term continued operation with inoperable SRMs if the monitoring function capability is maintained, and short term continued operation with no OPERABLE channels if all positive reactivity changes due to control rod withdrawal are suspended. These instruments are not the initiator of any accidents previously evaluated. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this change does not further degrade the capability of the system to perform its required function under these circumstances. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the required safety function capability or the Function will be maintained under the conditions during which it may be required.

L.2 CHANGE

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

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

   The requirement to "lock" the mode switch in the Shutdown position is not assumed in the initiation of any analyzed event. This requirement was specified in the Technical Specifications to ensure that the reactor mode switch was not inadvertently moved from the Shutdown position resulting in an unauthorized MODE change. However, adequate administrative controls exist as a result of ITS Table 1.1-1 and the requirements of ITS 3.0.4 to ensure the mode switch is maintained in the Shutdown position without the explicit requirement to "lock" the reactor mode switch in Shutdown. Reactor mode switch positions other than Shutdown result in the unit entering some other MODE; with the associated Technical Specification compliance requirements of that MODE and of ITS 3.0.4. As a result, the accident consequences are unaffected by this change. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The possibility of a new or different kind of accident from any accident previously evaluated is not created because the proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant.

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

   The requirement to "lock" the mode switch in the Shutdown position was specified in the Technical Specifications to ensure that the reactor mode switch was not inadvertently moved from the Shutdown position resulting in an unauthorized MODE change. However, adequate administrative controls exist as a result of ITS Table 1.1-1 and the requirements of ITS 3.0.4 to ensure the mode switch is maintained in the Shutdown position without the explicit requirement to "lock" the reactor mode switch in Shutdown. Reactor mode switch positions other that Shutdown result in the unit entering some other MODE; with the associated Technical Specification compliance requirements of that MODE and of ITS 3.0.4. Therefore, this change does not involve a significant reduction in a margin of safety.

L.3 CHANGE

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

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

   This change will allow entry into the applicable MODES and conditions and provide time after entry to perform the required Surveillance on the SRMs. The SRMs are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. This change does not impact the capability of the system to perform its required function, but provides time for confirmation of the capability of the system as soon a practical, when required. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since most surveillances only confirm the capability of the components to perform their function. The additional time to perform the Surveillance is consistent with the frequency provided in the BWR ISTS, NUREG-1434, Rev. 1, which has been previously approved by the NRC.

L.4 CHANGE

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

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

   The proposed change would remove an unnecessary additional performance of a Surveillance which has been performed within its normally required Frequency. Not performing the Surveillance would not affect any equipment which is assumed to be an initiator of any analyzed event. Since the Surveillance continues to be performed on its normal Frequency, there is no impact on the capability of the system to perform its required safety function. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated because the proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant.

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

   The normal Surveillance Frequency has been shown, based on operating experience, to be adequate for assuring the equipment is available and capable of performing its intended function. Additionally, the requirements of proposed SR 3.0.4 (CTS 4.0.4) provide assurance the equipment is OPERABLE prior to entering the MODES for which it is required. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.5 CHANGE

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

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

   This proposed change eliminates the requirement to fully insert control rods in core cells that do not contain fuel assemblies when the required SRM instrumentation is inoperable. Fully inserting control rods in core cells that contain no fuel assemblies has an insignificant impact on core reactivity and therefore, serves no purpose. The SRMs and associated actions are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, since control rods withdrawn from or inserted into a core cell containing no fuel assemblies have a negligible impact on the reactivity of the core, the consequences of an event occurring under the proposed action are the same as the consequences of an event occurring under the current action. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal operation. The proposed change still ensures that control rods which do have an impact on core reactivity are inserted in this condition. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   During MODE 5, fully inserting all insertable control rods in core cells containing no fuel assemblies is not necessary. In this situation, the ITS actions are adequate to ensure that the reactor is maintained subcritical since control rods withdrawn from or inserted into a core cell containing no fuel assemblies have a negligible impact on the reactivity of the core. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.6 CHANGE

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

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

   This change reduces the number of SRMs required to be OPERABLE in MODES 3 and 4 from three to two. A corresponding change is also made to the Required Actions in MODES 3 and 4 to reflect the change in the number of SRMs required to be OPERABLE. SRMs are not considered in the initiation of any previously analyzed accident. Therefore, this change does not significantly increase the frequency of such accidents. In MODES 3 and 4, the reactor mode switch is in the shutdown position and, as a result, all control rods are inserted. In this condition, the reduction in the number of SRMs required to be OPERABLE is considered to be acceptable since the reactor is shutdown and reactivity changes that may result in criticality are not expected since the ITS 3.1.1, SHUTDOWN MARGIN (SDM), requirements must still be met. In addition, ITS Table 1.1-1 requires the reactor mode switch to be in the shutdown position in MODES 3 and 4, which ensures that all control rods are inserted. Should a reactivity change occur, redundant monitoring capability of flux levels of the reactor core will continue to be provided by the two required SRMs to ensure that potential consequences associated with unexpected reactivity changes are not increased as a result of this change. Therefore, this change does not significantly increase the probability or consequences of any previously analyzed accident.

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

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change still ensures that redundant monitoring capability of flux levels of the reactor core is provided. In addition, ITS Table 1.1-1 requires the reactor mode switch to be in the shutdown position in MODES 3 and 4, which ensures that all control rods are inserted and the reactor is shutdown. Therefore, this change does not create the possibility of a new or different kind of accident from any previously analyzed accident.

L.6 CHANGE (continued)

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

The proposed change reduces the number of SRMs required to be OPERABLE in MODES 3 and 4 from three to two. A corresponding change is also made to the Required Actions in MODES 3 and 4 to reflect the change in the number of SRMs required to be OPERABLE. In MODES 3 and 4, the reactor mode switch is in the shutdown position and, as a result, all control rods are inserted. In this condition, reduction in the number of SRMs required to be OPERABLE is considered to be acceptable since the reactor is shutdown and reactivity changes that may result in criticality are not expected since the ITS 3.1.1, SHUTDOWN MARGIN (SDM), requirements must still be met. In addition, ITS Table 1.1-1 requires the reactor mode switch to be in the shutdown position in MODES 3 and 4, which ensures that all control rods are inserted. Should a reactivity change occur, redundant monitoring capability of flux levels of the reactor core will continue to be provided by the two required SRMs to ensure that the operators are provided with early indication of the unexpected reactivity change. Therefore, this change does not involve a significant reduction in the margin of safety.

L.7 CHANGE

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

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

   The change extends the time period to insert all insertable control rods and provides a Required Action to immediately initiate action and continue attempts to insert all insertable control rods. The SRMs and requirements to fully insert all insertable control rods immediately during refueling conditions if one or more SRMs are inoperable are not assumed in the initiation of any previously analyzed accident. As such, the proposed change will not increase the probability of any accident previously evaluated. Therefore, this change ensures that actions are taken to insert all insertable control rods in a timely manner while continuing to provide direction if attempts fail to immediately insert all insertable control rods. In addition, the consequences of an event occurring under the proposed action are the same as the consequences of an event occurring under the current action. Therefore, this change does not involve an increase in the consequences of any accident previously evaluated.

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

   The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated because the change does not introduce a new mode of plant operation and does not involve physical modification to the plant.

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

   During MODE 5, fully inserting all insertable control rods immediately may not always be possible. In this situation, the CTS do not provide direction as to the action to take. The proposed change provides a Required Action to immediately initiate action and continue attempts to insert all insertable control rods. This change ensures that actions are taken to insert all insertable control rods in a timely manner while continuing to provide direction if attempts fail to immediately insert all insertable control rods. This change is considered to be acceptable since ITS 3.3.1.2 Required Action E.1 ensures the probability of occurrence of postulated events involving changes in reactivity in the MODE 5 is minimized by suspension of CORE ALTERATIONS. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.8 CHANGE

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

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

   This change will limit the required applicability for source range monitors in MODE 5 to those monitors which are capable of providing the necessary function. SRMs are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not degrade the capability of the system to perform its design basis function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change introduces no change to the intended monitoring function provided by the SRMs, and it does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety. The remaining SRM is adequate to assist the response to an inadvertent criticality since the core configuration must follow a spiral load/discharge for which the probability of an inadvertent criticality is negligible.

L.1 CHANGE

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

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

   The proposed change would remove an unnecessary additional performance of a Surveillance that has been performed within its normally required Frequency. Not performing the Surveillance would not affect any equipment which is assumed to be an initiator of any analyzed event. Further, since the Surveillance continues to be performed on its normal Frequency, there is no impact on the capability of the system to perform its required safety function. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated because the proposed change does not introduce a new mode of plant operation and does not require physical modification to the plant.

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

   The normal Surveillance Frequency has been shown, based on operating experience, to be adequate for assuring the equipment is available and capable of performing its intended function. Additionally, the requirements of SR 3.0.4 (current Specification 4.0.4) provide assurance the equipment is OPERABLE prior to beginning the activities for which it is required. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.2 CHANGE

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

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

   The RWM is not assumed to be an initiator of any analyzed event. This change will allow one reactor startup each calendar year to commence with the RWM inoperable. However, the change will also ensure that the RWM is maintained OPERABLE through at least the withdrawal of the first 12 control rods instead of through just the first control rod. In addition, reactor startup with the RWM inoperable can only commence if the rod pattern is verified by two qualified personnel. Therefore, this change does not significantly increase the probability or consequences of an accident previously analyzed.

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

   The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated because the proposed change does not introduce a new mode of plant operation and does not require physical modification to the plant.

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

   Allowing the reactor startup to commence with RWM inoperable one time each calendar year is acceptable based on the compensatory measure provided. Two qualified personnel will be required to verify that movement of each control rod is in conformance with approved rod pattern. In addition, continuation of a reactor startup if the RWM becomes inoperable after the first control rod is withdrawn but before the twelfth control rod is withdrawn will now be controlled limiting this occurrence to once per calendar year. Currently, there is no limit to these occurrences. This change has been previously analyzed and found to be acceptable the NRC in their review of NEDE-24011-P-A, Amendment 17, since the change did not constitute a significant reduction in the margin of safety (the acceptance criterion of ≤ 280 cal/gm for the design basis rod drop accident is met even when this change is implemented).

L.3 CHANGE

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

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

   The proposed change deletes the requirement that limits the number of inoperable control rods in any one control rod pattern group during a plant startup. This change impacts the initial condition assumptions of the control rod drop accident (CRDA) and as a result potentially impacts the consequences of a CRDA. However, inoperable rods are not considered initiators for any accidents previously evaluated and, therefore, cannot increase the probability of such accidents. NEDO-21231, "Banked Position Withdrawal Sequence," describes the effects that operation with inoperable control rods has on a CRDA. Two cases were analyzed to determine the peak fuel enthalpy for various patterns of inoperable control rods. Both cases which are considered to bound all other possible configurations showed that the peak fuel enthalpy is well below the CRDA design basis limit. Therefore, this change is acceptable since these analyses have shown that peak fuel enthalpy resulting from a CRDA with the proposed change is not greater than the peak fuel enthalpy resulting from a CRDA with the existing requirements. In addition, ITS Actions ensure control rod worth is maintained below the limits addressed in NEDO-21231 by requiring the inoperable control rods to be separated from one another by at least two OPERABLE control rods and by restricting operation if more than 8 control rods are in non-compliance with the prescribed control rod pattern. As such, the proposed Technical Specification restrictions for inoperable control rods are adequate for ensuring plant operation is maintained within the bounds of the safety analysis. As a result, the change does not involve a significant increase in the consequences of an accident previously evaluated.

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

   The change introduces no new mode of plant operation and it does not involve physical modification to the plant. The proposed change continues to ensure plant operation is maintained within the bounds of the safety analysis. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

L.3 CHANGE (continued)

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

The proposed change deletes the requirement that limits the number of inoperable control rods in any one control rod pattern group during a plant startup. NEDO-21231, "Banked Position Withdrawal Sequence," describes the effects that operation with inoperable control rods has on a CRDA. Two cases were analyzed to determine the peak fuel enthalpy for various patterns of inoperable control rods. Both cases showed that the peak fuel enthalpy is below the CRDA design basis limit. Although the analysis that evaluated inoperable control rods in the same control rod group only evaluated 6 inoperable control rods, the resulting peak fuel enthalpy increase with two additional inoperable control rods (allowed by the proposed change) would only be slight because of the diversity of the inoperable control rods across the core. The analysis that evaluated 8 inoperable control rods is more limiting since this analysis evaluated all 8 control rods in the same half of the core which is not possible with control rods in the same control rod group. ITS Actions ensure control rod worth is maintained below the limits addressed in NEDO-21231 by requiring the inoperable control rods to be separated from one another by at least two OPERABLE control rods and by restricting operation if more than 8 control rods are in non-compliance with the prescribed control rod pattern. As such, the proposed Technical Specification restrictions for inoperable control rods are adequate for ensuring plant operation is maintained within the bounds of the safety analysis. Also, this change allows the added benefit of concentrating efforts on continuing the plant startup to raise power above the point where a CRDA is no longer a limiting event which will offset any increase in the margin of safety. As a result, the change does not involve a significant reduction in a margin of safety.

L.4 CHANGE

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

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

   This change will increase the surveillance interval of the CHANNEL FUNCTIONAL TEST to once every 92 days and allow the test to be performed 1 hour after the applicable condition is entered. The RWM is a highly accurate system, which has been shown to be reliable. In addition, other similar rod block Functions have a 92 day CHANNEL FUNCTIONAL TEST. This Frequency has been determined to be adequate in accordance with previously approved setpoint methodology. Also, the additional 1 hour allows time after the appropriate conditions are established to perform the test. Therefore, this change does not significantly increase the probability of a previously analyzed accident. An increase of the surveillance interval will not affect the capability of the component or system to perform its function nor alter assumptions relative to the mitigation of an accident. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since experience has shown that the components usually pass the surveillance when performed at the proposed frequency.

L.5 CHANGE

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

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

   The RBM is not assumed to be an initiator of any analyzed event. The change deletes an unnecessary restriction when one RBM is inoperable. Since the other channel remains OPERABLE, the RBM is capable of performing its safety function. In addition, the change also deletes an unnecessary surveillance requirement. Since the surveillance continues to be performed on its normal, quarterly frequency, there is no impact on the capability of the RBM to perform its required safety function. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated, because the proposed change does not introduce a new mode of plant operation and does not require physical modification to the plant.

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

   Increasing the time (by deleting CTS 3.1.4.3 Action a allowed to operate with one RBM inoperable while operating on a LIMITING CONTROL ROD PATTERN is acceptable based on the small probability of an event requiring the RBM to function. One RBM continues to be OPERABLE during this time and is capable of performing the required safety function. In addition, the probability of actually operating on a LIMITING CONTROL ROD PATTERN is very low. The Surveillance Requirement deletion is acceptable, since the normal Surveillance Frequency has been shown, based on operating experience, to be adequate for assuring the RBM channels are OPERABLE. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.2.2 - FEEDWATER SYSTEM AND MAIN TURBINE HIGH WATER LEVEL TRIP INSTRUMENTATION

L.1 CHANGE

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

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

   This change will reduce the applicable conditions for the Feedwater System and Main Turbine High Water Level Trip Instrumentation to only ≥ 25% RTP. The Feedwater System and Main Turbine High Water Level Trip Instrumentation is provided to protect against violation of the MCPR Safety Limit. However, adequate margin exists such that MCPR is not a concern below 25% RTP. The affected RPS function is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, this function is not credited for mitigation of any accident in the omitted conditions. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change introduces no new mode of plant operation and it does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the function is not credited below 25% RTP and the large safety margins in the thermal limits, inherent in the plant below 25% RTP, are not affected.

L.2 CHANGE

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

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

   This change will allow a feedwater pump to be removed from service to satisfy the Required Actions and allow continued operation. The Feedwater System and Main Turbine High Water Level Trip instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Removing the feedwater pump from service, when the instrumentation is inoperable solely due to an inoperable motor-driven feedwater pump breaker or feedwater turbine stop valve provides the required safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The purposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety function continues to provide the required Feedwater System and Main Turbine High Water Level Trip capability, including single failure conditions.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.3.1 - POST ACCIDENT MONITORING INSTRUMENTATION

L.1 CHANGE

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

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

   This change will allow entry into the applicable MODE with a Post Accident Monitoring (PAM) instrument inoperable. The PAM instrument channels are not assumed to be initiators of any analyzed event. The role of this instrumentation is in providing the operators information during and after an accident to allow them to take mitigating actions, thereby limiting consequences. With the proposed change, sufficient indication or alternate methods to monitor the parameter will remain OPERABLE to provide the operator with information necessary to evaluate potential plant conditions. In addition, the PAM instruments do not provide an active function to mitigate the consequences of any design basis accident or transient. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

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

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

   This change does not involve a significant reduction in a margin of safety since the instrumentation is not required to provide automatic response to any design basis accident or transient and the Technical Specifications will ensure that adequate indication of the affected parameter(s) is maintained for use by the operators.

L.2 CHANGE

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

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

   The change modifies the Surveillance to indicate when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the other required channel in the associated Function are OPERABLE. The PAMs are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not further degrade the capability of the monitors to perform their required function under these circumstances since one channel is still OPERABLE. In addition, if an accident should occur while the Surveillance is being performed, the instrument can be restored to OPERABLE status in a short period of time. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the monitors are not required to provide automatic response to any design basis accident. The additional time does not significantly affect the contribution of the monitors to risk reduction since the function is still being monitored by the other OPERABLE channel.

L.3 CHANGE

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

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

   This change will allow 30 days to restore one inoperable PAM instrument channel when the remaining PAM instrument channel of the Function is OPERABLE and 7 days to restore one inoperable PAM instrument channel when two PAM instrument channels of the Function are inoperable, thus minimizing the potential for a shutdown transient. The PAM instrument channels are not assumed to be initiators of any analyzed event. The role of this instrumentation is in providing the operators information during and after an accident to allow them to take mitigating actions, thereby limiting consequences. The requested change does not allow continuous operation since the available alternate indications may not fully meet all performance qualification requirements applied to the instruments. Additionally, the consequences of an event occurring with the proposed actions are no worse than the consequences of an event occurring with the existing shutdown actions. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

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

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

   The proposed action is acceptable based on the small probability of an event requiring the PAM instrumentation, the passive function of these instruments, and the alternate means of monitoring the affected parameter. Providing this proposed action will minimize the potential for plant transients that can occur during plant shutdowns by providing additional time for restoration of PAM instrument channel(s). As such, any reduction in a margin of safety will be offset by the benefit gained by avoiding an unnecessary plant shutdown transient when alternate monitoring capability exists. Therefore, this change does not involve a significant reduction in a margin of safety.

L.4 CHANGE

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

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

   This change will revise the Required Actions for inoperable PAM channels that are not restored to service within the allowable outage time. The PAM instrument channels are not assumed to be initiators of any analyzed event. The role of this instrumentation is in providing the operators information during and after an accident to allow them to take mitigating actions, thereby limiting consequences. The requested change does not allow continuous operation such that a single failure could result in a loss of function since the report requires an alternate means be established to monitor the affected parameter. Additionally, the consequences of an event occurring with the proposed actions are no worse than the consequences of an event occurring with the existing shutdown actions. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal operation. The proposed change will allow alternate means for monitoring the parameters be credited when PAM instrument channels are inoperable. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed action allowing continued operation provided alternate means of monitoring the affected parameters are identified and justified in a report to the NRC is acceptable based on the small probability of an event requiring the PAM instrumentation, the passive function of these instruments, and the alternate means of monitoring the affected parameter. This alternate means must be established and available to utilize the provisions of the proposed action. Providing this proposed action will minimize the potential for plant transients that can occur during plant shutdowns. As such, any reduction in a margin of safety will be offset by the benefit gained by avoiding an unnecessary plant shutdown transient when alternate monitoring capability exists. Therefore, this change does not involve a significant reduction in a margin of safety.

L.5 CHANGE

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

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

   The change allows 30 days to restore one inoperable primary containment gross gamma radiation monitor when one monitor is inoperable and 7 days to restore one inoperable primary containment gross gamma radiation monitor when two monitors are inoperable or to initiate the alternate method of monitoring, thus minimizing the potential for a shutdown transient. This change does not result in any hardware changes. The primary containment gross gamma radiation monitors are not initiators of any analyzed event. The role of this instrumentation is in providing the operators information relative to primary containment radiation levels during and after an accident to allow them to take mitigating actions, thereby limiting consequences. The requested change does not allow continuous operation since the available alternate indications may not fully meet all performance qualification requirements applied to the primary containment gross gamma radiation monitors. Additionally, the consequences of an event occurring with the proposed actions are the same as the consequences of an event occurring within the allowed outage time of the current actions. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed change is acceptable based on the small probability of an event requiring the primary containment gross gamma radiation monitors during the time period, the passive nature of the monitors, the availability of the redundant monitor (for the condition of one monitor inoperable) and the availability of alternate means to obtain the required information. Providing the proposed action will minimize the potential for plant transients that can occur during shutdown by providing additional time for the restoration of one monitor or the initiation of an alternate means of monitoring. As

L.5 CHANGE

3. (continued)

such, any reduction in a margin of safety resulting from the proposed change will be offset by the benefit gained by avoiding an unnecessary plant shutdown transient. Therefore, this change does not involve a significant reduction in a margin of safety.

L.1 CHANGE

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

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

   This change will provide additional time to restore inoperable remote shutdown monitoring system components. The remote shutdown monitoring system is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not further degrade the capability of the system to perform its required function under these circumstances. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the system is not required to respond to any mechanistic design basis accident. The additional time has been evaluated and determined to not significantly affect the contribution of the system to risk reduction.

L.2 CHANGE

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

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

   The change modifies the Surveillance to indicate when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours. The Remote Shutdown Monitoring System is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. In addition, if an accident should occur while the Surveillance is being performed, the instrument can be restored to OPERABLE status in a short period of time. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the instruments are not required to provide automatic response to any design basis accident. The additional time does not significantly affect the contribution of the instruments to risk reduction since the function can be restored in a short period of time.

L.3 CHANGE

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

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

   This change modifies the Channel Check Surveillance to exempt channels that are normally deenergized. The Remote Shutdown Monitoring System is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. In addition, since the channel is normally deenergized and is not indicating properly, no specific acceptance criteria for the Channel Check applies. That is, performance of the Channel Check with the instrument deenergized is essentially equivalent to not performing the requirement. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the instruments are not required to provide automatic response to any design basis accident. Not performing a Channel Check on a deenergized instrument does not significantly affect the contribution of the instrument to risk reduction since the instrument is calibrated properly and its OPERABILITY verified during the CHANNEL CALIBRATION.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.4.1 - EOC-RPT INSTRUMENTATION

L.1 CHANGE

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

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

   The EOC-RPT instrumentation is not assumed to be an initiator of any analyzed event. The instrumentations role is in mitigating and thereby limiting the consequences of violating the MCPR Safety Limit during a turbine trip or generator load rejection. Therefore, providing a time consistent with the MCPR operating limit time provides the same level of protection as the MCPR limit. Operation with EOC-RPT inoperable will have the same consequences in the event of a design basis transient as with the MCPR outside the limit. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not involve any design changes, plant modifications, or changes in plant operation. The overall system will continue to function in the same way as before the change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   With the EOC-RPT inoperable, ITS increases the Completion Time from 1 hour to 2 hours. The additional 1 hour provided is consistent with the 2 hours provided when MCPR is known to be outside the limit in ITS 3.2.2. The increased completion time to restore MCPR(s) within limits is acceptable based on the small probability of an event occurring during this time period. The 2 hour Completion Time provides adequate time to evaluate and to take the corrective action to restore the EOC-RPT to OPERABLE status. Due to the small probability of an event occurring during this time period and the MCPR Safety Limit requirement, this change does not involve a significant reduction in the margin of safety.

L.2 CHANGE

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

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

   This change will allow a recirculation pump fast speed breaker to be removed from service to satisfy the Required Actions and allow continued operation. Also, the EOC-RPT System is only required when any recirculation pump is in fast speed when ≥ 25% RTP. The EOC-RPT instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Removing the recirculation pump fast speed breaker from service provides the required safety function, which is to actuate to trip the fast speed breakers. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety functions continue to provide the required EOC-RPT actuation capability, including single failure conditions.

L.3 CHANGE

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

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

   This change will allow an inoperable channel to be placed in the tripped condition to satisfy the Required Actions and allow continued operation. The EOC-RPT instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. A tripped channel continues to provide the required safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety functions continue to provide the required EOC-RPT actuation capability, including single failure conditions.

L.4 CHANGE

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

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

   This change will identify Required Actions based on trip Function capability rather than single trip system OPERABILITY. Either condition results in decreased capability with regard to single failures; however, as long as both Functions are available, single failure capability must be restored or a shutdown will eventually be required in accordance with the proposed Required Actions. Therefore, this change does not significantly increase the probability or consequences of a previously analyzed accident.

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

   The proposed change introduces no new mode of plant operation and it does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since both Functions continue to provide the required EOC-RPT actuation capability. In addition, the probability of an event late in core life when the actual MCPR is not sufficient to preclude a safety limit violation is low.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.4.2 - ATWS-RPT INSTRUMENTATION

L.1 CHANGE

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

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

   This change will allow an inoperable channel to be placed in the tripped condition to satisfy the Required Actions and allow continued operation. The ATWS-RPT instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. A tripped channel continues to provide the required function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the Functions continue to provide the required ATWS-RPT actuation capability, including single failure conditions.

L.2 CHANGE

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

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

   This change will identify Required Actions based on trip Function capability rather than single trip system OPERABILITY. The ATWS-RPT instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Either condition results in decreased capability with regard to single failures; however, as long as one Function is available, single failure capability must be restored or a shutdown will eventually be required in accordance with the proposed Required Actions. Therefore, this change does not significantly increase the probability or consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since at least one Function continues to provide the required ATWS-RPT actuation capability. In addition, operator action can be taken to trip the recirculation pumps if a ATWS event (which is a beyond basis event) occurs.

L.3 CHANGE

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

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

   This change will allow an affected recirculation pump to be removed from service to satisfy the Required Actions and allow continued operation. The ATWS-RPT instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Removing the recirculation pump from service provides the required safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change introduces no new mode of plant operation and it does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety functions continue to provide the required ATWS-RPT actuation capability, including single failure conditions.

L.1 CHANGE

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

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

   This change will allow one or more inoperable channels to be placed in the tripped condition to satisfy the Required Actions and allow continued operation. Tripped channels in the ADS actuation logic are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. A tripped channel continues to provide the required safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety functions continue to provide the required ADS actuation capability, including single failure conditions.

L.2 CHANGE

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

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

   This change will raise the minimum pressure at which ADS is required to be OPERABLE to 150 psig. The ADS valves are not assumed to be an initiator of any analyzed event. ADS is assumed in the mitigation of consequences of a loss of coolant accident which occurs at high reactor vessel pressure. ADS is not assumed in the mitigation of low pressure events since its function is to lower the pressure to within the capabilities of the low pressure makeup systems. Since this capability is not affected there is no significant increase in the consequences of any previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The purpose of the ADS is to lower reactor pressure sufficiently to allow low pressure ECCS to inject and cool the core. Changing the minimum pressure for required OPERABILITY does not involve a significant reduction in a margin of safety since the ADS has been determined to be capable of performing its function at the higher reactor pressure (i.e., the current safety analysis shows the low pressure ECCS can provide core cooling at reactor pressure well above 150 psig).

L.3 CHANGE

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

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

   This change will allow two channels of a ECCS Instrumentation Function to be inoperable for up to 24 hours, 96 hours, or 8 days (depending upon the Function) prior to placing them in the tripped condition or declaring the associated ECCS inoperable. ECCS actuation logic is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. The channels for the LPCS, LPCI, and ADS Functions are combined in a two-out-of-two logic; thus when one or both channels of a Function are inoperable, the Function will not perform its intended function. For the HPCS Functions, with only one channel per trip system of a Function inoperable, the Function can still perform its intended function. The proposed out of service time has already previously been approved by the NRC for use at LaSalle 1 and 2 for one channel inoperable. Therefore, allowing two channels of a LPCS, LPCI, and ADS Function to be inoperable for this proposed time is equivalent to one channel inoperable; in both cases, the Function cannot perform its intended function. Allowing two HPCS channels (one per trip system) of a Function is acceptable since the Function can still perform its intended function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the overall ECCS safety function continues to provide the required ECCS actuation capability.

L.4 CHANGE

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

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

   This change deletes the requirement to remove the inoperable channel within 24 hours when one LPCS and LPCI A or one LPCI B and C Injection Valve Reactor Pressure—Low (Permissive) channel is inoperable. ECCS actuation logic and these specific channels are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. This instrumentation provides a permissive to open the LPCI and LPCS injection valves when the reactor pressure has decreased to an acceptable pressure, such that opening the injection valves will not result in overpressurization of the LPCI or LPCS Systems. The Action assumes the channel fails in the tripped condition, but this is not always true; it can fail such that a trip would not occur. The requirement to remove the inoperable channel is not necessary to ensure the LPCI and LPCS Systems are not overpressurized. In order for the associated injection valves to open, another signal from the associated LPCS and LPCI A or LPCI B and C Injection Valve Injection Pressure-Low Permissive channel must also occur. The Operability of these Functions continues to be controlled by the Technical Specifications. Therefore, assurance is provided the LPCI and LPCS Systems will continue to be protected from overpressurization. Therefore, allowing the channel to be inoperable and not removed is acceptable since the ECCS logic is still Operable during this time period and the consequences of a design basis accident will remain bounded by the current analyses. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the overall ECCS safety function continues to provide the required ECCS actuation capability.

L.5 CHANGE

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

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

   The ADS safety function is to provide depressurization capability for the reactor coolant system. Neither the low-low set function nor the ADS are considered as initiators of an accident previously evaluated. Therefore, the deletion of a channel calibration of the low-low set function to determine that it does not interfere with the operation of the ADS does not involve a significant increase in the probability of an accident previously evaluated. A periodic test will continue to be performed to assure the low-low set function does not interfere with the operation of the ADS. Therefore this change does not involve a significant increase in the consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. The proposed change removes a requirement to perform a calibration of instrumentation logic, but a test to assure the ADS safety function is not affected will continue to be performed. The requirement for ADS operability is not changed by the proposed change. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The proposed change does not affect the margin of safety because it merely removes a specific calibration requirement, while adequate testing continues to be performed to assure ADS operability. The requirement for ADS operability is not changed by the proposed change. Therefore, this change does not involve a significant reduction in a margin of safety.

L.6 CHANGE

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

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

   The instrumentation for the ECCS pump minimum flow valves is not assumed to be an initiator of any analyzed event. The instrumentation's role is pump protection and prevention of flow diversion in analyzed events, thereby limiting consequences. The proposed change to the Actions continues to require action to restore the inoperable channels. Placing a channel in trip does not compensate for the inoperability, and it may be a less safe action to take. When a channel is placed in trip, the minimum flow valve will remain either open or closed. Open results in ECCS flow bypass and the flow assumed in the ECCS analysis may not be met. When closed, the minimum flow valve will not open to provide minimum flow protection. This change allows action to be taken to restore isolation capability without imposing a loss of function for these valves. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not involve any design changes, plant modifications, or changes in plant operation. The proposed change continues to require action to be taken to restore the channels while potentially allowing the valves to continue to function. The system will continue to function in the same way as before the change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since it continues to assure that actions are taken to restore isolation capability. The change to the Action is acceptable based on the small probability of an event requiring an actuation and the desire to maintain ECCS availability.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.5.2 - RCIC SYSTEM INSTRUMENTATION

L.1 CHANGE

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

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

   This change will allow one or more inoperable channels to be placed in the tripped condition to satisfy the Required Actions and allow continued operation. The RCIC instrumentation is not assumed to be an initiator of any analyzed event. Therefore, this change does not significantly increase the probability of a previously analyzed accident. A tripped channel continues to provide the required safety function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the safety functions continue to provide the required RCIC actuation capability, including single failure conditions.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.6.1 - PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

L.1 CHANGE

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

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

   This change will allow continued operation with inoperable channels if the affected penetration is isolated. Isolated penetrations are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, isolating the penetration fulfills the post accident function of the isolation logic. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the required safety function of the inoperable channels will be fulfilled.

L.2 CHANGE

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

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

   This change will allow continued operation with inoperable channels if the affected main steam line penetration is isolated. Isolated penetrations are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, isolating the penetration fulfills the post accident function of the isolation logic. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant (an evaluation has already been performed to operate with one main steam line isolated). Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the required safety function of the inoperable channels will be fulfilled.

L.3 CHANGE

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

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

   This change will provide additional time to isolate the main steam lines and will allow continued operation with inoperable channels if the affected main steam line penetration is isolated. Inoperable main steam isolation logic is not considered as an initiator for any accidents previously analyzed. The change will not allow continuous operation such that a single failure will preclude the affected isolation function from being performed. This change allows isolating the affected penetration, which fulfills the post accident function of the isolation logic. This change also allows an additional 6 hours to close the MSIVs, which provides a reasonable amount of time to perform an orderly closure of the valves (which requires entry into MODE 2), thus further minimizing a potential upset from a too rapid decrease in plant power. Additionally, the consequences of an event occurring while the unit is reducing power in order to close the MSIVs during the extra 6 hours is the same as the consequences of an event occurring for the current 6 hours. Therefore, this change does not significantly increase the probability or consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The increased time allowed for isolating the main steam lines with inoperable channels is acceptable based on the small probability of an event requiring the inoperable channels to function, the ability to isolate the main steam lines manually if an event occurs, and the minimization of plant transients. In addition, with the affected main steam line isolated, the safety function of the inoperable channels has been fulfilled. The proposed 6 hour extension will provide sufficient time for the unit to close the MSIVs. As a result, the potential for human error will be reduced. As such, any reduction in a margin of safety will be insignificant and offset by the benefit gained from providing sufficient time to close the MSIVs, thus avoiding potential plant transients from attempting to close the MSIVs in the current time.

L.4 CHANGE

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

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

   This change reduces the Applicability of the Standby Liquid Control (SLC) System Initiation Function from MODES 1, 2, and 3 to MODES 1 and 2 only. The reduction in the Applicability is acceptable since with the unit in MODE 3 the reactor will be shutdown with all control rods inserted. Therefore, the additional shutdown requirements of the SLC System will not be necessary to mitigate an ATWS event. The proposed Applicability is consistent with the Applicability of ITS 3.1.7 for the SLC System. The SLC System Initiation Function is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. This change does not impact the capability of the system to perform its required function when needed since the control rods are inserted in MODE 3. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since other requirements prevent the withdrawal of control rods in MODE 3, thus the SLC System and SLC System Initiation Function is not necessary.

L.5 CHANGE

Not used.

L.6 CHANGE

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

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

   The OPERABILITY requirements of the Reactor Vessel Water Level — Low, Level 3, have been deleted for the RHR Shutdown Cooling System valves while operating in MODES 1 and 2. The RHR Shutdown Cooling System isolation instrumentation is not assumed to be an initiator of any analyzed event. The role of the instrumentation is in containing reactor coolant in analyzed pipe break events and thereby limiting the consequences. In MODES 1 and 2, this function is accomplished by the Reactor Vessel Pressure — High Function and other Technical Specification requirements that preclude operation of the RHR Shutdown Cooling System. Thus, the Reactor Vessel Water Level — Low, Level 3, Function is not needed in these MODES. Therefore, this proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   In MODES 1 and 2, the Reactor Vessel Pressure — High Function and other Technical Specification requirements assures the RHR Shutdown Cooling System remains isolated. In MODE 3, the Reactor Vessel Water Level — Low, Level 3 Function is still required to provide RHR Shutdown Cooling System isolation, since this is a MODE that the RHR Shutdown Cooling System can operate. As such, this change does not involve a significant reduction in a margin of safety.

L.7 CHANGE

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

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

   The proposed change deletes the requirement to "lock" the affected isolation valves closed within 1 hour (the requirement to isolate the penetration within 1 hour remains). The "locked" status of an isolation valve is not considered an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. The "locked" status also does not impact the performance of the isolated valve since the requirement to maintain the penetration isolated remains in the Technical Specifications. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the Technical Specifications continue to require the affected penetration be maintained isolated, which will prevent the valves from being opened, until the required primary containment isolation instrumentation channels are restored to Operable status.

L.8 CHANGE

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

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

   The RHR shutdown cooling system isolation instrumentation is not assumed to be an initiator of any analyzed event. The instrumentation's role is in containing reactor coolant in analyzed events and thereby limiting consequences. The proposed change to the Actions allows the option to initiate action to restore the inoperable channels or to initiate action to isolate shutdown cooling, which is currently required. This allows an alternate decay heat removal method to be made available prior to isolating shutdown cooling. This change allows action to be taken to restore isolation capability without causing a loss of shutdown cooling. The increase in consequences is offset by the capability to continue using the shutdown cooling method. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not involve any design changes, plant modifications, or changes in plant operation. The proposed change continues to require action to be taken to isolate the penetration or restore the channels while still allowing an alternate decay heat removal method to be made available prior to isolating shutdown cooling. The system will continue to function in the same way as before the change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since it assures that actions are taken to restore isolation capability. The change to the Action is acceptable based on the small probability of an event requiring shutdown cooling isolation and the desire to maintain adequate shutdown cooling. The exposure of the plant to the small probability of an event requiring shutdown cooling isolation is insignificant and offset by the benefit of avoiding a loss of shutdown cooling.

L.9 CHANGE

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

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

   This change will provide additional time to isolate the affected penetrations with inoperable manual initiation logic. Manual initiation isolation logic is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not further degrade the capability of the system to perform its required function under these circumstances. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since additional time is minor, the ability to isolate the penetration manually if an event occurs, and is consistent with the time period allowed for other equipment that is not assumed to operate for mitigation of a DBA.

L.10 CHANGE

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

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

   The OPERABILITY requirements of the Manual Initiation channels associated with Groups 3, 8 and 9 inboard and outboard valves have been deleted from the Manual Functions. This Manual Initiation Function isolates the valves associated with the RCIC System and the recirculation sample valves. These Manual Initiation channels are not assumed to be an initiator of any analyzed event. Therefore, this change does not increase the probability of an accident previously evaluated. These manual isolation channels for Groups 3, 8 and 9 valves are valve switches which can effect isolation of the individual valves. These valve switches are not considered part of the primary containment isolation function but, rather, are part of the valve control design. This equipment is not credited in any design bases accident or transient analyses. The proposed automatic Isolation Functions provide adequate protection to ensure that the systems are isolated when required. Therefore, the removal of these Manual Initiation channels from the Technical Specifications does not influence the results of any design bases accident analyses or transient analyses. Therefore, this proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The OPERABILITY requirements of the Manual Initiation channels associated with these inboard and outboard valves have been deleted from the Manual Functions. This Manual Initiation Function isolates the valves associated with the RCIC System and the recirculation sample valves. These manual isolation channels for these valves are valve switches which can effect isolation of the individual valves. These valve switches are

L.10 CHANGE

3. (continued)

not considered part of the primary containment isolation function but, rather, are part of the valve control design. This equipment is not credited in any design bases accident or transient analyses. The proposed automatic Isolation Functions provides adequate protection to ensure that the systems are isolated when required. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.11 CHANGE

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

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

   This change provides the option to declare the SLC System inoperable instead of isolating the RWCU System. The SLC System Initiation Function instrumentation is not assumed to be an initiator for any analyzed event. The role of the instrumentation is to isolate the RWCU System to ensure the SLC System can function properly and the injected boron is not removed from the Reactor Coolant System. The proposed change to the ACTIONS will not allow continuous operation such that the SLC System cannot perform its intended function. Therefore, this change does not significantly increase in the probability or consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve a physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since the proposed alternative actions are identical to those associated with the mechanical Specification (SLC System). Since the instrumentation actuates to ensure the SLC System can perform its intended function, these actions are appropriate and the margin of safety is maintained equivalent to the margin of safety when the SLC System is inoperable.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.6.2 - SECONDARY CONTAINMENT ISOLATION INSTRUMENTATION

L.1 CHANGE

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

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

   The change provides the option to declare the affected systems inoperable instead of closing the SCIVs and placing the SGT System in operation. The secondary containment isolation instrumentation is not assumed to be an initiator of any analyzed event. The role of the instrumentation is to mitigate and thereby limit the consequences of a design basis accident. The instrumentation actuates to ensure the SCIVs are closed and SGT System is initiated to ensure secondary containment leakage is limited during a design basis accident. The proposed change to the ACTIONS will not allow continuous operation such that a single failure will preclude SCIV or SGT System initiation from mitigating the consequences of a design basis accident. Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since the proposed alternative actions are identical to those associated with the mechanical Specifications (SGT System and SCIVs). Since the instrumentation actuates the SGT subsystems and the SCIVs, these actions are appropriate and the margin of safety is maintained equivalent to the margin of safety when the SGT systems are inoperable or if the SCIVs are inoperable.

L.2 CHANGE

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

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

   An action has been added which allows the associated SGT subsystem to be started, instead of declaring it inoperable, which will allow the plant to continue operating. The secondary containment isolation instrumentation is not assumed to be an initiator of any analyzed event. The role of the instrumentation is to mitigate and thereby limit the consequences of a design basis accident. The instrumentation actuates to ensure the SCIVs are closed and the SGT System is initiated to ensure secondary containment leakage is limited during a design basis accident. The proposed change to the Actions will not allow continuous operation such that a single failure will preclude SCIV or SGT System initiation from mitigating the consequences of a design basis accident. Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since the Required Actions either actuate the associated equipment (SCIVs and SGT System) or requires a declaration that the associated equipment is inoperable. Compensatory actions currently exist for this second action. This change also provides a benefit through the potential avoidance of a plant shutdown when alternate compensatory measures are available to ensure the instrumentations and associated equipments intended function is satisfied.

L.3 CHANGE

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

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

   This change will remove requirements for OPERABILITY of secondary containment isolation instrumentation on low reactor vessel water level during CORE ALTERATIONS. Secondary containment isolation instrumentation is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, secondary containment isolation and SGT System actuation on low water level is not assumed in the mitigation of previously analyzed events occurring during a CORE ALTERATION. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the requirements continue to provide OPERABILITY of the secondary containment isolation instrumentation function under conditions assumed in the safety analyses.

L.4 CHANGE

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

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

   This change requires either isolation of the associated penetration flow path of the affected equipment, in this case Secondary Containment Isolation Valves (SCIVs), or a declaration that the associated equipment is inoperable if the Manual Initiation Function instrumentation is inoperable. The current Specifications require both of these actions to be performed or require a plant shutdown. The secondary containment isolation instrumentation is not assumed to be an initiator of any analyzed event. The role of the instrumentation is to mitigate and thereby limit the consequences of a design basis accident. The Manual Initiation Function instrumentation actuates to close the SCIVs and initiate the Standby Gas Treatment (SGT) System to limit unfiltered secondary containment leakage. However, the Manual Initiation Function is not credited in any design basis accident. The proposed change to the Actions will not allow continuous operation such that a single failure will preclude SCIV or SGT System initiation from mitigating the consequences of a design basis accident. Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since the Required Actions either require isolation of the associated penetration flow path of the affected equipment (in this case SCIVs) or require the associated equipment to be declared inoperable. Compensatory actions currently exist for this second action. In addition, the Manual Initiation Function is not credited in any design basis accident. This change also provides a benefit through the potential avoidance of a plant shutdown when alternate compensatory measures are available to ensure the safety function of the instrumentation and associated equipment is satisfied.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.7.1 - CRAF SYSTEM INSTRUMENTATION

L.1 CHANGE

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

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

   Control Room Area Filtration (CRAF) System Instrumentation is used to mitigate the consequences of an accident; however, CRAF System Instrumentation is not considered in the initiation of any previously analyzed accident. As such, the proposed revision to the Applicability for the CRAF System Instrumentation during shutdown conditions will not increase the probability of any accident previously evaluated. In MODE 4 or 5, activities are conducted for which significant releases of radioactivity are postulated which require the CRAF System Instrumentation for mitigation of potential consequences. Therefore, the CRAF System Instrumentation is required to be OPERABLE in MODE 4 or 5, when activities are in progress which could, if an event occurs, result in significant releases of radioactivity (during movement of irradiated fuel assemblies in secondary containment, during CORE ALTERATIONS, or during OPDRVS). This change alters the current Applicability requirements to only include these activities. This is considered acceptable since the Technical Specification requires the CRAF System Instrumentation to be OPERABLE when it is required to mitigate postulated events in MODE 4 or 5. This change maintains situations for which significant releases of radioactivity are postulated while the plant is in MODE 4 or 5. In addition, the change to Applicability is consistent with the intent of current Technical Specification ACTIONS (in MODE 4 and 5 with two CRAF subsystems inoperable, the CTS ACTIONS require suspension of those activities for which significant releases of radioactivity are postulated). The proposed change still ensures the CRAF System Instrumentation is OPERABLE during conditions when radioactive releases are postulated. Therefore, the proposed change does not affect the consequences of an accident previously evaluated.

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

   The proposed change does not involve a physical modification to the plant or a change in parameters governing normal plant operation. The proposed change still requires the CRAF System Instrumentation to be OPERABLE when it is required to perform its safety function. Therefore, the change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

L.1 CHANGE (continued)

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

The proposed change alters MODE 4 and 5 Applicability requirements for the CRAF System Instrumentation to include only those activities which could, if an event occurs, result in significant releases of radioactivity (i.e., during movement of irradiated fuel assemblies in secondary containment, during CORE ALTERATIONS, or during OPDRVS). This is considered acceptable since the Technical Specifications still require the CRAF System Instrumentation to be OPERABLE when it is required to mitigate postulated events in MODE 4 or 5. The ITS 3.3.7.1 Applicability maintains situations for which significant releases of radioactivity are postulated while the plant is in MODE 4 or 5. In addition, the change is consistent with the intent of CTS 3.7.2 ACTIONS (in MODE 4 and 5 with two CRAF subsystems inoperable, the CTS ACTIONS require suspension of those activities for which significant releases of radioactivity are postulated). The proposed change still ensures the CRAF System Instrumentation is OPERABLE during conditions when radioactive releases are postulated. In addition, this change provides additional scheduling flexibility during plant refueling outages by not requiring the CRAF System Instrumentation to be OPERABLE during operations that do not have a potential for a significant radioactive releases. The proposed change does not impact any accident analysis assumptions. Thus, no question of safety is involved. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

L.2 CHANGE

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

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

   This change allows an extension of the time to place the CRAF subsystem in the pressurization mode of up to 7 days. The CRAF System instrumentation is not assumed to be an initiator of any analyzed event. The role of the instrumentation is to mitigate and thereby limit the consequences of a design basis accident. The instrumentation actuates to ensure the CRAF System is initiated to ensure main control room dose is limited during a design basis accident. The proposed change to the Actions will not allow continuous operation such that a single failure will preclude CRAF System initiation from mitigating the consequences of a design basis accident. Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No significant reduction in a margin of safety is involved with this change since the Required Actions either actuate the associated equipment (CRAF subsystem) or require a declaration that the associated equipment is inoperable (which subsequently requires actuation of the CRAF subsustem). Compensatory actions currently exist for this second action for when the CRAF subsystem is inoperable for reasons other than instrumentation inoperabilities. This change also provides a benefit through the potential avoidance of a plant shutdown when alternate compensatory measures are available to ensure the intended function of the instrumentation and associated equipment is satisfied.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.8.1 - LOSS OF POWER INSTRUMENTATION

There were no plant specific less restrictive changes identified for this Specification.

NO SIGNIFICANT HAZARDS CONSIDERATION
ITS: 3.3.8.2 - RPS ELECTRIC POWER MONITORING

L.1 CHANGE

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

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

   This change will limit the required applicability to those conditions during which the RPS electric power monitor assemblies provide a necessary function. Although loss of power is considered in conjunction with design basis accidents, it is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not degrade the capability of the RPS electric power monitor assemblies to perform their design basis function when needed. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the RPS electric power monitor assemblies are provided to assure adequate power is available to the RPS and RPS bus powered equipment when required and this change only affects conditions where such power would not be required.

L.2 CHANGE

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

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

   This change will provide additional time to restore inoperable RPS electric power monitor assemblies. The RPS electric power monitor assemblies are not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Also, this change does not further degrade the capability of the RPS electric power monitor assemblies to perform their required function under these circumstances. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   This change does not involve a significant reduction in a margin of safety since the extended time is small and allows for operator consideration of plant conditions, personnel availability and appropriate response.

L.3 CHANGE

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

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

   This change removes the requirement to notify the NRC if required by 10 CFR 50.72 and to submit a Licensee Event Report as required by 10 CFR 50.73 if the RPS electric power monitoring assemblies are not restored to Operable status or the MG set or alternate power supply is not removed from service in MODES or other specified conditions other than MODES 1, 2, and 3. The change replaces these requirements with specific actions that place the reactor in the least reactive condition and ensures either the safety function of the RPS, primary containment isolation system, and secondary containment isolation system will not be required or is already met. An operation is also provided to restore the assembly to OPERABLE status under certain conditions since there may be a need for the RHR SDC System. Alternately, operations are also provided under certain conditions to declare the affected components inoperable and take the ACTIONS required by individual Specifications. The required reports are not considered as initiators for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. The consequences of a previously analyzed accident are not affected by the deletion of these reporting requirements since they do not impact the assumptions of any design basis accident or transient.

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

   The proposed change does not introduce a new mode of plant operation and does not involve physical modification to the plant. Therefore, it does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   The margin of safety is not reduced by removing the requirement for the submittal of these required reports. This change has no effect on the assumptions of design basis accidents or transients. This change has no impact on safe operation of the plant because adequate actions are provided if the RPS electric power monitoring assemblies cannot be restored and the RPS MG set or alternate power supply cannot be removed from service. This change does not affect any plant equipment or requirements for maintaining plant equipment. Therefore, this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATION
CTS: 3/4.3.7.3 - METEOROLOGICAL MONITORING INSTRUMENTATION

There were no plant specific less restrictive changes identified for this Specification.

NO SIGNIFICANT HAZARDS CONSIDERATION
CTS: 3/4.3.7.11 - EXPLOSIVE GAS MONITORING INSTRUMENTATION

There were no plant specific less restrictive changes identified for this Specification.

NO SIGNIFICANT HAZARDS CONSIDERATION
CTS: 3/4.3.7.12 - LOOSE PART DETECTION SYSTEM

There were no plant specific less restrictive changes identified for this Specification.

ENVIRONMENTAL ASSESSMENT
ITS: SECTION 3.3 - INSTRUMENTATION

In accordance with the criteria set forth in 10 CFR 50.21, ComEd has evaluated this proposed Technical Specification change for identification of licensing and regulatory actions requiring environmental assessment, determined it meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9) and as such, has determined that no irreversible consequences exist in accordance with 10 CFR 50.92(b). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR which changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or which changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria:

1. The amendment involves no significant hazards consideration.

   As demonstrated in the No Significant Hazards Consideration, this proposed amendment does not involve any significant hazards consideration.

2. There is no significant change in the type or significant increase in the amounts of any effluents that may be released offsite.

   The proposed change will not result in changes in the operation or configuration of the facility. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore, there will be no change in the types or significant increase in the amounts of any effluents released offsite resulting from this change.

3. There is no significant increase in individual or cumulative occupational radiation exposure.

   The proposed change will not result in changes in the operation or configuration of the facility which impact radiation exposure. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore, there will be no increase in individual or cumulative occupational radiation exposure resulting from this change.

Therefore, based upon the above evaluation, ComEd has concluded that no irreversible consequences exist with the proposed change.