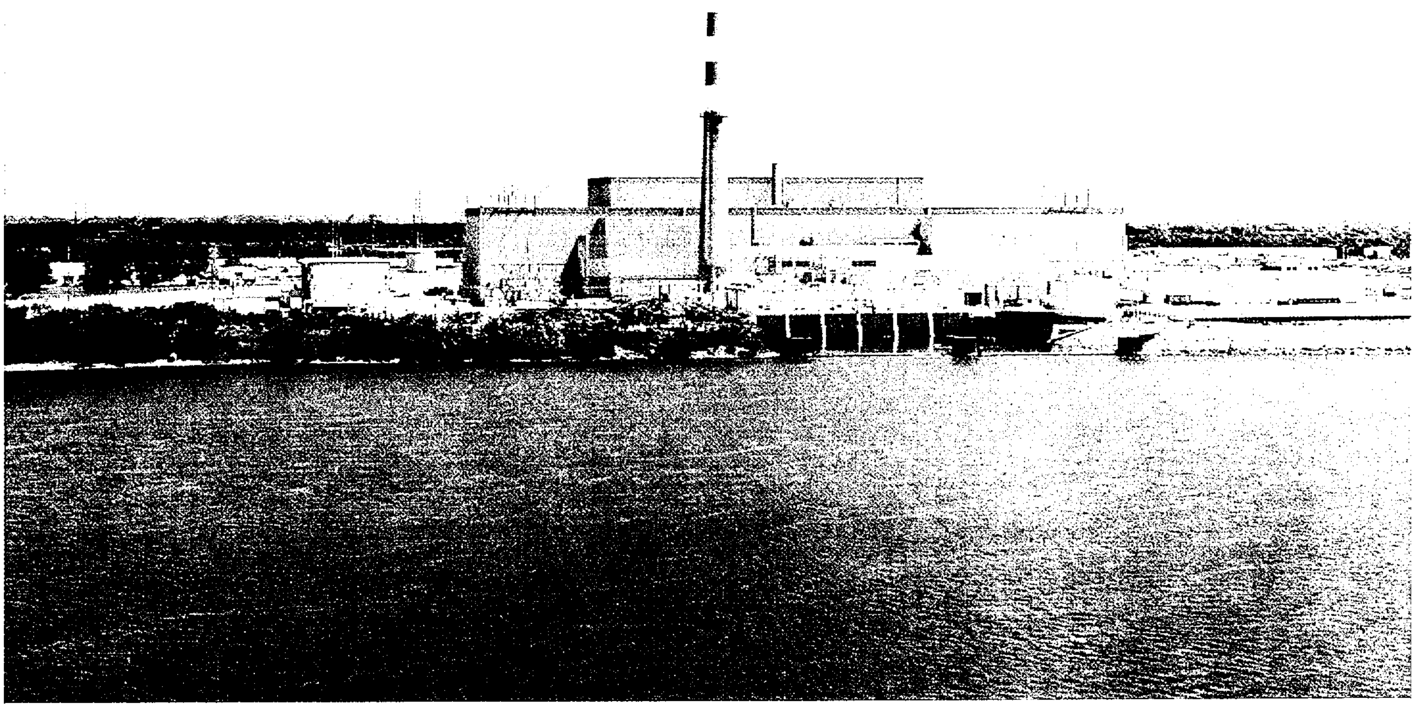
Improved Technical Specifications



Quad Cities Station

Volume 6:
Section 3.6; ITS Bases, and
CTS Markup/DOC's

ComEd

3.6 CONTAINMENT SYSTEMS

3.6.1.1 Primary Containment

LCO 3.6.1.1 Primary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Primary containment inoperable.	A.1 Restore primary containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1.1	Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2	Verify drywell-to-suppression chamber bypass leakage is less than or equal to the bypass leakage limit. However, during the first unit startup following bypass leakage testing performed in accordance with this SR, the acceptance criterion is $\leq$ 2% of the drywell-to-suppression chamber bypass leakage limit.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.1.2 Primary Containment Air Lock

LCO 3.6.1.2 The primary containment air lock shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

1. Entry and exit is permissible to perform repairs of the air lock components.

2. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when air lock leakage results in exceeding overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One primary containment air lock door inoperable.	------------NOTES------------ 1. Required Actions A.1, A.2, and A.3 are not applicable if both doors in the air lock are inoperable and Condition C is entered. 2. Entry and exit is permissible for 7 days under administrative controls. ----------------------------	
	A.1 Verify the OPERABLE door is closed.	1 hour
	<u>AND</u>	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	Lock the OPERABLE door closed.	24 hours
	AND		
	A.3	--------NOTE-------- Air lock doors in high radiation areas or areas with limited access due to inerting may be verified locked closed by administrative means. -------------------- Verify the OPERABLE door is locked closed.	Once per 31 days
B. Primary containment air lock interlock mechanism inoperable.	------------NOTES------------ 1. Required Actions B.1, B.2, and B.3 are not applicable if both doors in the air lock are inoperable and Condition C is entered. 2. Entry into and exit from primary containment is permissible under the control of a dedicated individual. ----------------------------		
	B.1	Verify an OPERABLE door is closed.	1 hour
	AND		
			(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Lock an OPERABLE door closed.	24 hours
	AND		
	B.3	--------NOTE--------- Air lock doors in high radiation areas or areas with limited access due to inerting may be verified locked closed by administrative means. ---------------------	
		Verify an OPERABLE door is locked closed.	Once per 31 days
C. Primary containment air lock inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate primary containment overall leakage rate per LCO 3.6.1.1, using current air lock test results.	Immediately
	AND		
	C.2	Verify a door is closed.	1 hour
	AND		
	C.3	Restore air lock to OPERABLE status.	24 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.2.1	------------------NOTE------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria applicable to SR 3.6.1.1.1. -- Perform required primary containment air lock leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.2.2	Verify only one door in the primary containment air lock can be opened at a time.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.1.3 Primary Containment Isolation Valves (PCIVs)

LCO 3.6.1.3 Each PCIV, except reactor building-to-suppression chamber vacuum breakers, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
When associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation."

ACTIONS

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

1. Penetration flow paths may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by PCIVs.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," when PCIV leakage results in exceeding overall containment leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ---------NOTE--------- Only applicable to penetration flow paths with two or more PCIVs. --------------------- One or more penetration flow paths with one PCIV inoperable except due to main steam line isolation valve (MSIV) leakage rate not within limit.	A.1 <u>AND</u>	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.	4 hours except for main steam line <u>AND</u> 8 hours for main steam line (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	--------NOTES-------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------------------	
		Verify the affected penetration flow path is isolated.	Once per 31 days for isolation devices outside primary containment <u>AND</u> Prior to entering MODE 2 or 3 from MODE 4, if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days, for isolation devices inside primary containment

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. ---------NOTE--------- Only applicable to penetration flow paths with two or more PCIVs. --------------------- One or more penetration flow paths with two or more PCIVs inoperable except due to MSIV leakage rate not within limit.	B.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
C. ---------NOTE--------- Only applicable to penetration flow paths with only one PCIV. --------------------- One or more penetration flow paths with one PCIV inoperable.	C.1 AND	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	4 hours except for excess flow check valves (EFCVs) and penetrations with a closed system AND 72 hours for EFCVs and penetrations with a closed system (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2	--------NOTES-------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are a locked, sealed, or otherwise secured may be verified by use of administrative means. --------------------- Verify the affected penetration flow path is isolated.	Once per 31 days
D. One or more penetration flow paths with MSIV leakage rate not within limit.	D.1	Restore leakage rate to within limit.	8 hours
E. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, or 3.	E.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	E.2	Be in MODE 4.	36 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, or D not met for PCIV(s) required to be OPERABLE during MODE 4 or 5.	F.1 Initiate action to suspend operations with a potential for draining the reactor vessel (OPDRVs). OR F.2 Initiate action to restore valve(s) to OPERABLE status.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.1	------------------NOTE------------------ Not required to be met when the 18 inch primary containment vent and purge valves are open for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open, provided the drywell vent and purge valves and their associated suppression chamber vent and purge valves are not open simultaneously. -- Verify each 18 inch primary containment vent and purge valve, except the torus purge valve, is closed.	 31 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.2	-----------------NOTES----------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. --------------------------------------- Verify each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed.	31 days
SR 3.6.1.3.3	-----------------NOTES----------------- 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for PCIVs that are open under administrative controls. --------------------------------------- Verify each primary containment manual isolation valve and blind flange that is located inside primary containment and not locked sealed, or otherwise secured and is required to be closed during accident conditions is closed.	Prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.4	Verify continuity of the traversing incore probe (TIP) shear isolation valve explosive charge.	31 days
SR 3.6.1.3.5	Verify the isolation time of each power operated, automatic PCIV, except for MSIVs, is within limits.	In accordance with the Inservice Testing Program
SR 3.6.1.3.6	Verify the isolation time of each MSIV is $\geq$ 3 seconds and $\leq$ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.7	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	24 months
SR 3.6.1.3.8	Verify each reactor instrumentation line EFCV actuates to the isolation position on an actual or simulated instrument line break signal.	24 months
SR 3.6.1.3.9	Remove and test the explosive squib from each shear isolation valve of the TIP System.	24 months on a STAGGERED TEST BASIS

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.10	Verify the combined leakage rate for all MSIV leakage paths is ≤ 46 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.1.4 Drywell Pressure

LCO 3.6.1.4 Drywell pressure shall be ≤ 1.5 psig.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Drywell pressure not within limit.	A.1 Restore drywell pressure to within limit.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.4.1 Verify drywell pressure is within limit.	12 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.5 Drywell Air Temperature

LCO 3.6.1.5 Drywell average air temperature shall be ≤ 150°F.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Drywell average air temperature not within limit.	A.1 Restore drywell average air temperature to within limit.	8 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.5.1 Verify drywell average air temperature is within limit.	24 hours

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Low Set Relief Valves

LCO 3.6.1.6 The low set relief function of two relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low set relief valve inoperable.	A.1 Restore low set relief valve to OPERABLE status.	14 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two low set relief valves inoperable.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.6.1	------------------NOTE------------------ Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -- Verify each low set relief valve opens when manually actuated.	24 months
SR 3.6.1.6.2	------------------NOTE------------------ Valve actuation may be excluded. -- Verify each low set relief valve actuates on an actual or simulated automatic initiation signal.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.1.7 Reactor Building-to-Suppression Chamber Vacuum Breakers

LCO 3.6.1.7 Each reactor building-to-suppression chamber vacuum breaker shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more lines with one reactor building-to-suppression chamber vacuum breaker not closed.	A.1 Close the open vacuum breaker.	7 days
B. One or more lines with two reactor building-to-suppression chamber vacuum breakers not closed.	B.1 Close one open vacuum breaker.	1 hour
C. One line with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening.	C.1 Restore the vacuum breaker(s) to OPERABLE status.	7 days

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two lines with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening.	D.1 Restore all vacuum breakers in one line to OPERABLE status.	1 hour
E. Required Action and Associated Completion Time not met.	E.1 Be in MODE 3. <u>AND</u> E.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.7.1	-----NOTES----- 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. ---------- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.7.2	Perform a functional test of each vacuum breaker.	92 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.7.3	Verify the opening setpoint of each vacuum breaker is ≤ 0.5 psid.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.1.8 Suppression Chamber-to-Drywell Vacuum Breakers

LCO 3.6.1.8 Nine suppression chamber-to-drywell vacuum breakers shall be OPERABLE for opening.

AND

Twelve suppression chamber-to-drywell vacuum breakers shall be closed.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required suppression chamber-to-drywell vacuum breaker inoperable for opening.	A.1 Restore one vacuum breaker to OPERABLE status.	72 hours
B. One suppression chamber-to-drywell vacuum breaker not closed.	B.1 Close the open vacuum breaker.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.8.1	------------------NOTES------------------ 1. Not required to be met for vacuum breakers that are open during Surveillances. 2. Not required to be met for vacuum breakers open when performing their intended function. --- Verify each vacuum breaker is closed.	14 days
SR 3.6.1.8.2	Perform a functional test of each required vacuum breaker.	31 days <u>AND</u> Within 12 hours after any discharge of steam to the suppression chamber from the relief valves
SR 3.6.1.8.3	Verify the opening setpoint of each required vacuum breaker is $\leq$ 0.5 psid.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.2.1 Suppression Pool Average Temperature

LCO 3.6.2.1 Suppression pool average temperature shall be:

a. $\leq$ 95°F with THERMAL POWER > 1% RTP and no testing that adds heat to the suppression pool is being performed;

b. $\leq$ 105°F with THERMAL POWER > 1% RTP and testing that adds heat to the suppression pool is being performed; and

c. $\leq$ 110°F with THERMAL POWER $\leq$ 1% RTP.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Suppression pool average temperature > 95°F but $\leq$ 110°F. AND THERMAL POWER > 1% RTP. AND Not performing testing that adds heat to the suppression pool.	A.1 Verify suppression pool average temperature $\leq$ 110°F. AND A.2 Restore suppression pool average temperature to $\leq$ 95°F.	Once per hour 24 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Reduce THERMAL POWER to $\leq$ 1% RTP.	12 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Suppression pool average temperature > 105°F. AND THERMAL POWER > 1% RTP. AND Performing testing that adds heat to the suppression pool.	C.1	Suspend all testing that adds heat to the suppression pool.	Immediately
D. Suppression pool average temperature > 110°F but ≤ 120°F.	D.1	Place the reactor mode switch in the shutdown position.	Immediately
	AND		
	D.2	Verify suppression pool average temperature ≤ 120°F.	Once per 30 minutes
	AND		
	D.3	Be in MODE 4.	36 hours
E. Suppression pool average temperature > 120°F.	E.1	Depressurize the reactor vessel to < 150 psig.	12 hours
	AND		
	E.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.1.1	Verify suppression pool average temperature is within the applicable limits.	24 hours <u>AND</u> 5 minutes when performing testing that adds heat to the suppression pool

3.6 CONTAINMENT SYSTEMS

3.6.2.2 Suppression Pool Water Level

LCO 3.6.2.2 Suppression pool water level shall be $\geq$ 14 ft 1 inch and $\leq$ 14 ft 5 inches.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Suppression pool water level not within limits.	A.1 Restore suppression pool water level to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.2.1 Verify suppression pool water level is within limits.	24 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

LCO 3.6.2.3 Two RHR suppression pool cooling subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RHR suppression pool cooling subsystem inoperable.	A.1	Restore RHR suppression pool cooling subsystem to OPERABLE status.	7 days
B. Two RHR suppression pool cooling subsystems inoperable.	B.1	Restore one RHR suppression pool cooling subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	C.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.3.1	Verify each RHR suppression pool cooling subsystem manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.2.3.2	Verify each required RHR pump develops a flow rate $\geq$ 5000 gpm through the associated heat exchanger while operating in the suppression pool cooling mode.	In accordance with the Inservice Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.2.4 Residual Heat Removal (RHR) Suppression Pool Spray

LCO 3.6.2.4 Two RHR suppression pool spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One RHR suppression pool spray subsystem inoperable.	A.1	Restore RHR suppression pool spray subsystem to OPERABLE status.	7 days
B. Two RHR suppression pool spray subsystems inoperable.	B.1	Restore one RHR suppression pool spray subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	C.2	Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.4.1	Verify each RHR suppression pool spray subsystem manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.	31 days
SR 3.6.2.4.2	Verify each suppression pool spray nozzle is unobstructed.	5 years

3.6 CONTAINMENT SYSTEMS

3.6.2.5 Drywell-to-Suppression Chamber Differential Pressure

LCO 3.6.2.5 The drywell pressure shall be maintained $\geq$ 1.0 psid above the pressure of the suppression chamber.

------------------------NOTE------------------------
Not required to be met for up to 4 hours during performance of required Surveillances.

APPLICABILITY: MODE 1 during the time period:

a. From 24 hours after THERMAL POWER is > 15% RTP following startup, to

b. 24 hours prior to reducing THERMAL POWER to < 15% RTP prior to the next scheduled reactor shutdown.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Drywell-to-suppression chamber differential pressure not within limit.	A.1 Restore differential pressure to within limit.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 15% RTP.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.2.5.1	Verify drywell-to-suppression chamber differential pressure is within limit.	12 hours

3.6 CONTAINMENT SYSTEMS

3.6.3.1 Primary Containment Oxygen Concentration

LCO 3.6.3.1 The primary containment oxygen concentration shall be < 4.0 volume percent.

APPLICABILITY: MODE 1 during the time period:

a. From 24 hours after THERMAL POWER is > 15% RTP following startup, to

b. 24 hours prior to reducing THERMAL POWER to < 15% RTP prior to the next scheduled reactor shutdown.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Primary containment oxygen concentration not within limit.	A.1 Restore oxygen concentration to within limit.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 15% RTP.	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.3.1.1 Verify primary containment oxygen concentration is within limits.	7 days

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: 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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1	Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours
C. Secondary containment inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	C.1	--------NOTE--------- LCO 3.0.3 is not applicable. --------------------- Suspend movement of irradiated fuel assemblies in the secondary containment.	Immediately
	AND		
			(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. (continued)	C.2	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	C.3	Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is $\geq$ 0.1 inch of vacuum water gauge.	24 hours
SR 3.6.4.1.2	Verify one secondary containment access door in each access opening is closed.	31 days
SR 3.6.4.1.3	Verify the secondary containment can be maintained $\geq$ 0.25 inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate $\leq$ 4000 cfm.	24 months on a STAGGERED TEST BASIS for each SGT subsystem

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves (SCIVs)

LCO 3.6.4.2 Each SCIV shall be OPERABLE.

APPLICABILITY: 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

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

1. Penetration flow paths may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by SCIVs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one SCIV inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. <u>AND</u>	8 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2	--------NOTES-------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. --------------------- Verify the affected penetration flow path is isolated.	 Once per 31 days
B. ---------NOTE--------- Only applicable to penetration flow paths with two isolation valves. --------------------- One or more penetration flow paths with two SCIVs inoperable.	B.1	Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	4 hours

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours
D. 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.	D.1 --------NOTE-------- LCO 3.0.3 is not applicable. -------------------- Suspend movement of irradiated fuel assemblies in the secondary containment. AND D.2 Suspend CORE ALTERATIONS. AND D.3 Initiate action to suspend OPDRVs.	 Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.4.2.1	------------------NOTES------------------ 1. Valves and blind flanges in high radiation areas may be verified by use of administrative means. 2. Not required to be met for SCIVs that are open under administrative controls. -- Verify each secondary containment isolation manual valve and blind flange that is not locked, sealed or otherwise secured and is required to be closed during accident conditions is closed.	31 days
SR 3.6.4.2.2	Verify the isolation time of each power operated, automatic SCIV is within limits.	92 days
SR 3.6.4.2.3	Verify each automatic SCIV actuates to the isolation position on an actual or simulated actuation signal.	24 months

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: 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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	------------NOTE------------ LCO 3.0.3 is not applicable. ---------------------------- C.1 Place OPERABLE SGT subsystem in operation. OR	Immediately

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.1 Suspend movement of irradiated fuel assemblies in secondary containment. <u>AND</u> C.2.2 Suspend CORE ALTERATIONS. <u>AND</u> C.2.3 Initiate action to suspend OPDRVs.	Immediately Immediately Immediately
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Restore one SGT subsystem to OPERABLE status.	1 hour
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 3. <u>AND</u> E.2 Be in MODE 4.	12 hours 36 hours
F. Two SGT subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs.	F.1 --------NOTE-------- LCO 3.0.3 is not applicable. -------------------- Suspend movement of irradiated fuel assemblies in secondary containment. <u>AND</u>	 Immediately (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. (continued)	F.2 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	F.3 Initiate action to suspend OPDRVs.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for $\geq$ 10 continuous hours with heaters operating.	31 days
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	24 months

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.1 Primary Containment

BASES

BACKGROUND

The function of the primary containment is to isolate and contain fission products released from the associated Reactor Primary System following a design basis Loss of Coolant Accident (LOCA) and to confine the postulated release of radioactive material. The primary containment consists of a drywell, which is a steel pressure vessel, enclosed in reinforced concrete, and a suppression chamber, which is a steel torus-shaped pressure vessel, connected by vent pipes. The primary containment surrounds the Reactor Primary System and provides an essentially leak tight barrier against an uncontrolled release of radioactive material to the environment.

The isolation devices for the penetrations in the primary containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

a. All penetrations required to be closed during accident conditions are either:

    1. capable of being closed by an OPERABLE automatic containment isolation system, or

    2. closed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)";

b. The primary containment air lock is OPERABLE, except as provided in LCO 3.6.1.2, "Primary Containment Air Lock";

c. All equipment hatches are closed and sealed; and

d. The sealing mechanism associated with each primary containment penetration (e.g., welds, bellows, or O-rings) is OPERABLE.

(continued)

BASES

BACKGROUND (continued)

This Specification ensures that the performance of the primary containment, in the event of a Design Basis Accident (DBA), meets the assumptions used in the safety analyses of References 1 and 2. SR 3.6.1.1.1 leakage rate requirements are in conformance with 10 CFR 50, Appendix J, Option B (Ref. 3), as modified by approved exemptions.

APPLICABLE SAFETY ANALYSES

The safety design basis for the primary containment is that it must withstand the pressures and temperatures of the limiting DBA without exceeding the design leakage rate.

The DBA that postulates the maximum release of radioactive material within primary containment is a LOCA. In the analysis of this accident, it is assumed that primary containment is OPERABLE such that release of fission products to the environment is controlled by the rate of primary containment leakage.

Analytical methods and assumptions involving the primary containment are presented in References 1 and 2. The safety analyses assume a nonmechanistic fission product release following a DBA, which forms the basis for determination of offsite doses. The fission product release is, in turn, based on an assumed leakage rate from the primary containment. OPERABILITY of the primary containment ensures that the leakage rate assumed in the safety analyses is not exceeded.

The maximum allowable leakage rate for the primary containment (L_a) is 1.0% by weight of the containment air per 24 hours at the design basis LOCA peak calculated containment pressure (P_a) of 48 psig.

Primary containment satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Primary containment OPERABILITY is maintained by limiting leakage to $\leq$ 1.0 L_a, except prior to the first startup after performing a required Primary Containment Leakage Rate Testing Program leakage test. At this time, applicable leakage limits must be met. In addition, the leakage from the drywell to the suppression chamber must be limited to

(continued)

BASES

LCO (continued)

ensure the primary containment pressure and temperature does not exceed design limits. Compliance with this LCO will ensure a primary containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analyses.

Individual leakage rates specified for the primary containment air lock are addressed in LCO 3.6.1.2.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, primary containment is not required to be OPERABLE in MODES 4 and 5 to prevent leakage of radioactive material from primary containment.

ACTIONS

A.1

In the event primary containment is inoperable, primary containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining primary containment OPERABILITY during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring primary containment OPERABILITY) occurring during periods where primary containment is inoperable is minimal.

B.1 and B.2

If primary containment cannot be restored to OPERABLE status within the required Completion Time, 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.1

Maintaining the primary containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. Failure to meet air lock leakage limit (SR 3.6.1.2.1) or main steam isolation valve leakage limit (SR 3.6.1.3.10) does not necessarily result in a failure of this SR. The impact of the failure to meet these SRs must be evaluated against the Type A, B, and C acceptance criteria of the Primary Containment Leakage Rate Testing Program.

As left leakage prior to the first startup after performing a required Primary Containment Leakage Rate Testing Program leakage test is required to be $< 0.6\ L_a$ for combined Type B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

SR 3.6.1.1.2

The analyses results in Reference 4 are based on a maximum drywell-to-suppression chamber bypass leakage. This Surveillance ensures that the actual bypass leakage is less than or equal to the acceptable $A/\sqrt{k}$ design value of 0.18 ft^2 assumed in the safety analysis. For example, with a typical loss factor of 3 or greater, the maximum allowable leakage area would be approximately 0.3 ft^2, corresponding to a 8-in line size.

As left bypass leakage, prior to the first startup after performing a required bypass leakage test, is required to be $\leq$ 2% of the drywell-to-suppression chamber bypass leakage limit. At all other times between required leakage rate tests, the acceptance criteria is based on design $A/\sqrt{k}$. At the design $A/\sqrt{k}$ the containment temperature and pressurization response are bounded by the assumptions of the safety analysis. The leakage test is performed every 24 months, consistent with the difficulty of performing the

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.1.1.2 (continued) test, risk of high radiation exposure, and the remote possibility of a component failure that is not identified by some other drywell or primary containment SR.
REFERENCES	1. UFSAR, Section 6.2.1. 2. UFSAR, Section 15.6.5. 3. 10 CFR 50, Appendix J, Option B. 4. UFSAR, Section 6.2.1.2.4.1.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.2 Primary Containment Air Lock

BASES

BACKGROUND

One double door primary containment air lock has been built into the primary containment to provide personnel access to the drywell and to provide primary containment isolation during the process of personnel entering and exiting the drywell. The air lock is designed to withstand the same loads, temperatures, and peak design internal and external pressures as the primary containment (Ref. 1). As part of the primary containment, the air lock limits the release of radioactive material to the environment during normal unit operation and through a range of transients and accidents up to and including postulated Design Basis Accidents (DBAs).

Each air lock door has been designed and tested to certify its ability to withstand a pressure in excess of the maximum expected pressure following a DBA in primary containment. Each of the doors contains a gasketed seal. To effect a leak tight seal, the air lock design uses pressure seated doors (i.e., an increase in primary containment internal pressure results in increased sealing force on each door).

Each air lock is nominally a right circular cylinder, 10 ft in diameter, with doors at each end that are interlocked to prevent simultaneous opening. The air lock is provided with gear driven position indicators on both doors that provide local indication of door position. During periods when primary containment is not required to be OPERABLE, the air lock interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent primary containment entry is necessary. Under some conditions as allowed by this LCO, the primary containment may be accessed through the air lock, when the interlock mechanism has failed, by manually performing the interlock function.

The primary containment air lock forms part of the primary containment pressure boundary. As such, air lock integrity and leak tightness are essential for maintaining primary

(continued)

BASES

BACKGROUND (continued)	containment leakage rate to within limits in the event of a DBA. Not maintaining air lock integrity or leak tightness may result in a leakage rate in excess of that assumed in the safety analysis.
APPLICABLE SAFETY ANALYSES	The DBA that postulates the maximum release of radioactive material within primary containment is a LOCA. In the analysis of this accident, it is assumed that primary containment is OPERABLE, such that release of fission products to the environment is controlled by the rate of primary containment leakage. The primary containment is designed with a maximum allowable leakage rate (L_a) of 1.0% by weight of the containment air mass per 24 hours at the design basis LOCA peak calculated containment pressure (P_a) of 48 psig (Ref. 2). This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air lock. Primary containment air lock OPERABILITY is also required to minimize the amount of fission product gases that may escape primary containment through the air lock and contaminate and pressurize the secondary containment. The primary containment air lock satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	As part of the primary containment pressure boundary, the air lock safety function is related to control of containment leakage following a DBA. Thus, the air lock structural integrity and leak tightness are essential to the successful mitigation of such an event. The primary containment air lock is required to be OPERABLE. For the air lock to be considered OPERABLE, the air lock interlock mechanism must be OPERABLE, the air lock must be in compliance with the Type B air lock leakage test, and both air lock doors must be OPERABLE. The interlock allows only one air lock door to be opened at a time. This provision ensures that a gross breach of primary containment does not exist when primary containment is required to be OPERABLE. Closure of a single door in the air lock is

(continued)

BASES

LCO (continued)	sufficient to provide a leak tight barrier following postulated events. Nevertheless, both doors are kept closed when the air lock is not being used for normal entry or exit from primary containment.
APPLICABILITY	In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the primary containment air lock is not required to be OPERABLE in MODES 4 and 5 to prevent leakage of radioactive material from primary containment.
ACTIONS	The ACTIONS are modified by Note 1, which allows entry and exit to perform repairs of the affected air lock component. If the outer door is inoperable, then it may be easily accessed to repair. If the inner door is the one that is inoperable, however, then a short time exists when the containment boundary is not intact (during access through the OPERABLE outer door). The allowance to open the OPERABLE door, even if it means the primary containment boundary is temporarily not intact, is acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which the OPERABLE door is expected to be open. The required administrative controls consist of stationing a dedicated individual to assure closure of the OPERABLE door except during entry and exit, and to assure the OPERABLE door is relocked after completion of the containment entry and exit. The ACTIONS are modified by a second Note, which ensures appropriate remedial measures are taken when necessary, if air lock leakage results in exceeding overall containment leakage rate acceptance criteria. Pursuant to LCO 3.0.6, actions are not required, even if primary containment leakage is exceeding L_a. Therefore, the Note is added to require ACTIONS for LCO 3.6.1.1, "Primary Containment," to be taken in this event.

(continued)

BASES

ACTIONS (continued)

A.1, A.2, and A.3

With one primary containment air lock door inoperable, the OPERABLE door must be verified closed (Required Action A.1) in the air lock. This ensures that a leak tight primary containment barrier is maintained by the use of an OPERABLE air lock door. This action must be completed within 1 hour. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, which requires that primary containment be restored to OPERABLE status within 1 hour.

In addition, the air lock penetration must be isolated by locking closed the OPERABLE air lock door within the 24 hour Completion Time. The 24 hour Completion Time is considered reasonable for locking the OPERABLE air lock door, considering that the OPERABLE door is being maintained closed.

Required Action A.3 ensures that the air lock penetration has been isolated by the use of a locked closed OPERABLE air lock door. This ensures that an acceptable primary containment leakage boundary is maintained. The Completion Time of once per 31 days is based on engineering judgment and is considered adequate given the low likelihood of a locked door being mispositioned and other administrative controls. Required Action A.3 is modified by a Note that applies to air lock doors located in high radiation areas or areas with limited access due to inerting and allows these doors to be verified locked closed by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of the door, once it has been verified to be in the proper position, is small.

The Required Actions have been modified by two Notes. Note 1 ensures that only the Required Actions and associated Completion Times of Condition C are required if both doors in the air lock are inoperable. With both doors in the air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. The exception of Note 1 does not affect tracking the Completion Time from the initial entry into Condition A; only the requirement to comply with the Required Actions. Note 2 allows use of the air lock for entry and exit for 7 days under administrative controls.

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

Primary containment entry may be required to perform Technical Specifications (TS) Surveillances and Required Actions, as well as other activities inside primary containment that are required by TS or activities that support TS-required equipment. This Note is not intended to preclude performing other activities (i.e., non-TS-related activities) if the primary containment was entered, using the inoperable air lock, to perform an allowed activity listed above. The required administrative controls consist of stationing a dedicated individual to assure closure of the OPERABLE door except during entry and exit, and to assure the OPERABLE door is relocked after completion of the containment entry and exit. This allowance is acceptable due to the low probability of an event that could pressurize the primary containment during the short time that the OPERABLE door is expected to be open.

B.1, B.2, and B.3

With an air lock interlock mechanism inoperable, the Required Actions and associated Completion Times are consistent with those specified in Condition A.

The Required Actions have been modified by two Notes. Note 1 ensures that only the Required Actions and associated Completion Times of Condition C are required if both doors in the air lock are inoperable. With both doors in the air lock inoperable, an OPERABLE door is not available to be closed. Required Actions C.1 and C.2 are the appropriate remedial actions. Note 2 allows entry into and exit from the primary containment under the control of a dedicated individual stationed at the air lock to ensure that only one door is opened at a time (i.e., the individual performs the function of the interlock).

Required Action B.3 is modified by a Note that applies to air lock doors located in high radiation areas or areas with limited access due to inerting and that allows these doors to be verified locked closed by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted. Therefore, the probability of misalignment of the door, once it has been verified to be in the proper position, is small.

(continued)

BASES

ACTIONS (continued)

C.1, C.2, and C.3

If the air lock is inoperable for reasons other than those described in Condition A or B, Required Action C.1 requires action to be immediately initiated to evaluate containment overall leakage rates using current air lock leakage test results. An evaluation is acceptable since it is overly conservative to immediately declare the primary containment inoperable if the overall air lock leakage is not within limits. In many instances, primary containment remains OPERABLE, yet only 1 hour (according to LCO 3.6.1.1) would be provided to restore the air lock door to OPERABLE status prior to requiring a plant shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits.

Required Action C.2 requires that one door in the primary containment air lock must be verified closed. This action must be completed within the 1 hour Completion Time. This specified time period is consistent with the ACTIONS of LCO 3.6.1.1, which require that primary containment be restored to OPERABLE status within 1 hour.

Additionally, the air lock must be restored to OPERABLE status within 24 hours (Required Action C.3). The 24 hour Completion Time is reasonable for restoring an inoperable air lock to OPERABLE status considering that at least one door is maintained closed in the air lock.

D.1 and D.2

If the inoperable primary containment air lock cannot be restored to OPERABLE status within the associated Completion Time, 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.1

Maintaining the primary containment air lock OPERABLE requires compliance with the leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. This SR reflects the leakage rate testing requirements with respect to air lock leakage (Type B leakage tests). The acceptance criteria were established during initial air lock and primary containment OPERABILITY testing. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR, requiring the results to be evaluated against the acceptance criteria which are applicable to SR 3.6.1.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Types B and C primary containment leakage rate.

SR 3.6.1.2.2

The air lock interlock mechanism is designed to prevent simultaneous opening of both doors in the air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident primary containment pressure, closure of either door will support primary containment OPERABILITY. Thus, the interlock feature supports primary containment OPERABILITY while the air lock is being used for personnel transit in and out of the containment. Periodic testing of this interlock demonstrates that the interlock will function as designed and that simultaneous inner and outer door opening will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the primary containment air lock door is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.2.2 (continued)

Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of primary containment OPERABILITY if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. The 24 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during the use of the air lock.

REFERENCES

1. UFSAR, Section 6.2.1.2.1.
2. UFSAR, Section 15.6.5.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.3 Primary Containment Isolation Valves (PCIVs)

BASES

BACKGROUND

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) to within limits. 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 OPERABILITY requirements for PCIVs help ensure that an adequate primary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. Therefore, the OPERABILITY requirements provide assurance that primary containment function assumed in the safety analyses will be maintained. These isolation devices are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges (which include plugs and caps as listed in Reference 1), and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices. Two barriers in series are provided for each penetration, except for penetrations isolated by excess flow check valves, so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. One of these barriers may be a closed system.

The reactor building-to-suppression chamber vacuum breakers serve a dual function, one of which is primary containment isolation. However, since the other safety function of the vacuum breakers would not be available if the normal PCIV actions were taken, the PCIV OPERABILITY requirements are not applicable to the reactor building-to-suppression chamber vacuum breakers valves. Similar surveillance

(continued)

BACKGROUND (continued)

requirements in the LCO for reactor building-to-suppression chamber vacuum breakers provide assurance that the isolation capability is available without conflicting with the vacuum relief function.

The primary containment purge valves are 18 inches in diameter; vent valves are 2, 6, and 18 inches in diameter. The 18 inch primary containment vent and purge valves are normally maintained closed in MODES 1, 2, and 3 to ensure the primary containment boundary is maintained except for torus purge valve 1601-56. This valve is normally open for pressure control. This is acceptable since this valve and other vent and purge valves are designed to automatically close on LOCA conditions. The isolation valves on the 18 inch vent lines from the suppression chamber and drywell have 2 inch bypass lines around them for use during normal reactor operation. Use of the 2 inch vent valves will prevent high pressure from reaching the Standby Gas Treatment System filter trains and the Reactor Building Ventilation System in the unlikely event of a loss of coolant accident (LOCA) during venting.

APPLICABLE SAFETY ANALYSES

The PCIVs LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory, and establishing the primary containment boundary during major accidents. As part of the primary containment boundary, PCIV OPERABILITY supports leak tightness of primary containment. Therefore, the safety analysis of any event requiring isolation of primary containment is applicable to this LCO.

The DBAs that result in a release of radioactive material for which the consequences are mitigated by PCIVs are a LOCA, and a main steam line break (MSLB) (Refs. 2, and 3, respectively). In the analysis for each of these accidents, it is assumed that PCIVs are either closed or close within the required isolation times following event initiation. This ensures that potential paths to the environment through PCIVs (including primary containment purge valves) are minimized. Of the events analyzed in Reference 4, the LOCA is the most limiting event due to radiological consequences. The closure time of the main steam isolation valves (MSIVs) is a significant variable from a radiological standpoint.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The MSIVs are required to close within 3 to 5 seconds since the 3 second closure time is assumed in the MSIV closure (the most severe overpressurization transient) analysis (Ref. 5) and the 5 second closure time is assumed in the MSLB analysis (Ref. 3). Likewise, it is assumed that the primary containment isolates such that release of fission products to the environment is controlled.

The DBA analysis assumes that isolation of the primary containment is complete and leakage is terminated, except for the maximum allowable leakage rate, L_a, prior to fuel damage.

The single failure criterion required to be imposed in the conduct of unit safety analyses was considered in the original design of the primary containment vent and purge valves. Two valves in series on each vent and purge line provide assurance that both the supply and exhaust lines could be isolated even if a single failure occurred.

PCIVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

PCIVs form a part of the primary containment boundary. The PCIV safety function is related to minimizing the loss of reactor coolant inventory and establishing the primary containment boundary during a DBA.

The power operated, automatic isolation valves are required to have isolation times within limits and actuate on an automatic isolation signal. While the reactor building-to-suppression chamber vacuum breakers isolate primary containment penetrations, they are excluded from this Specification. Controls on their isolation function are adequately addressed in LCO 3.6.1.7, "Reactor Building-to-Suppression Chamber Vacuum Breakers." The valves covered by this LCO are listed with their associated stroke times in the Technical Requirements Manual (Ref. 1).

The normally closed manual PCIVs are considered OPERABLE when the valves are closed and blind flanges are in place, or open under administrative controls. Normally closed automatic PCIVs which are required by design (e.g., to meet

(continued)

BASES

LCO (continued)

10 CFR 50 Appendix R requirements) to be de-activated and closed, are considered OPERABLE when the valves are closed and de-activated. These passive isolation valves and devices are those listed in Reference 1.

MSIVs must meet additional leakage rate requirements. Other PCIV leakage rates are addressed by LCO 3.6.1.1, "Primary Containment," as Type B or C testing.

This LCO provides assurance that the PCIVs will perform their designed safety functions to minimize the loss of reactor coolant inventory and establish the primary containment boundary during accidents.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, most PCIVs are not required to be OPERABLE in MODES 4 and 5. Certain valves, however, are required to be OPERABLE to prevent inadvertent reactor vessel draindown. These valves are those whose associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation." (This does not include the valves that isolate the associated instrumentation.)

ACTIONS

The ACTIONS are modified by a Note allowing penetration flow path(s) to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

A second Note has been added to provide clarification that, for the purpose of this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable PCIV. Complying with the Required Actions may allow for continued operation, and subsequent inoperable PCIVs are governed by subsequent Condition entry and application of associated Required Actions.

(continued)

BASES

ACTIONS (continued)

The ACTIONS are modified by Notes 3 and 4. Note 3 ensures that appropriate remedial actions are taken, if necessary, if the affected system(s) are rendered inoperable by an inoperable PCIV (e.g., an Emergency Core Cooling System subsystem is inoperable due to a failed open test return valve). Note 4 ensures appropriate remedial actions are taken when the primary containment leakage limits are exceeded. Pursuant to LCO 3.0.6, these actions are not required even when the associated LCO is not met. Therefore, Notes 3 and 4 are added to require the proper actions be taken.

A.1 and A.2

With one or more penetration flow paths with one PCIV inoperable except for MSIV leakage rate not within limit, the affected penetration flow paths must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. For a penetration isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available valve to the primary containment. The Required Action must be completed within the 4 hour Completion Time (8 hours for main steam lines). The Completion Time of 4 hours is reasonable considering the time required to isolate the penetration and the relative importance of supporting primary containment OPERABILITY during MODES 1, 2, and 3. For main steam lines, an 8 hour Completion Time is allowed. The Completion Time of 8 hours for the main steam lines allows a period of time to restore the MSIVs to OPERABLE status given the fact that MSIV closure will result in isolation of the main steam line(s) and a potential for plant shutdown.

For affected penetrations that have been isolated in accordance with Required Action A.1, the affected penetration flow path(s) must be verified to be isolated on a periodic basis. This is necessary to ensure that primary containment penetrations required to be isolated following an accident, and no longer capable of being automatically isolated, will be in the isolation position should an event

(continued)

ACTIONS

A.1 and A.2 (continued)

occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification that those devices outside primary containment and capable of potentially being mispositioned are in the correct position. The Completion Time of "once per 31 days for isolation devices outside primary containment" is appropriate because the devices are operated under administrative controls and the probability of their misalignment is low. For the devices inside primary containment, the time period specified "prior to entering MODE 2 or 3 from MODE 4, if primary containment was de-inerted while in MODE 4 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the devices and the existence of other administrative controls ensuring that device misalignment is an unlikely possibility.

Condition A is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with two or more PCIVs. For penetration flow paths with one PCIV, Condition C provides the appropriate Required Actions.

Required Action A.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows them to be verified by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned. Therefore, the probability of misalignment, once they have been verified to be in the proper position, is low.

B.1

With one or more penetration flow paths with two or more PCIVs inoperable except for MSIV leakage, either the inoperable PCIVs must be restored to OPERABLE status or the

(continued)

BASES

ACTIONS

B.1 (continued)

affected penetration flow path must be isolated within 1 hour. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1.1.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two or more PCIVs. For penetration flow paths with one PCIV, Condition C provides the appropriate Required Actions.

C.1 and C.2

With one or more penetration flow paths with one PCIV inoperable, the inoperable valve must be restored to OPERABLE status or the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. A check valve may not be used to isolate the affected penetration. Required Action C.1 must be completed within 4 hours except for excess flow check valves (EFCVs) and penetrations with a closed system and 72 hours for EFCVs and penetrations with a closed system. The Completion Time of 4 hours for valves other than EFCVs and in penetrations with a closed system is reasonable considering the time required to isolate the penetration and the relative importance of supporting primary containment OPERABILITY in MODES 1, 2, and 3. The 72 hour Completion Time for penetrations with a closed system is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of supporting primary containment OPERABILITY during MODES 1, 2, and 3. The closed system must meet the requirements of Reference 6. The Completion Time of 72 hours for EFCVs is also reasonable considering the instrument and the small pipe diameter of penetration

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

(hence, reliability) to act as a penetration isolation boundary and the small pipe diameter of the affected penetrations. In the event the affected penetration flow path is isolated in accordance with Required Action C.1, the affected penetration must be verified to be isolated on a periodic basis. This is necessary to ensure that primary containment penetrations required to be isolated following an accident are isolated. This Required Action does not require any testing or valve manipulation. Rather, it involves verification that those devices outside containment and capable of potentially being mispositioned are in the correct position. The Completion Time of once per 31 days is appropriate because the devices are operated under administrative controls and the probability of their misalignment is low.

Condition C is modified by a Note indicating that this Condition is only applicable to penetration flow paths with only one PCIV. For penetration flow paths with two or more PCIVs, Conditions A and B provide the appropriate Required Actions. This Note is necessary since this Condition is written specifically to address those penetrations with a single PCIV.

Required Action C.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows them to be verified by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently repositioned. Therefore, the probability of misalignment, once they have been verified to be in the proper position, is low.

(continued)

BASES

ACTIONS (continued)

D.1

With MSIV leakage rate not within limit, the assumptions of the safety analysis may not be met. Therefore, the leakage must be restored to within limit within 8 hours. Restoration can be accomplished by isolating the penetration that caused the limit to be exceeded by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. When a penetration is isolated, the leakage rate for the isolated penetration is assumed to be the actual pathway leakage through the isolation device. If two isolation devices are used to isolate the penetration, the leakage rate is assumed to be the lesser actual pathway leakage of the two devices. The 8 hour Completion Time allows a reasonable period of time to restore MSIV leakage and is acceptable given the fact that MSIV closure will result in isolation of the main steam lines and a potential for plant shutdown.

E.1 and E.2

If any Required Action and associated Completion Time cannot be met in MODE 1, 2, or 3, 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.

F.1 and F.2

If any Required Action and associated Completion Time cannot be met for PCIV(s) required OPERABLE in MODE 4 or 5, the unit must be placed in a condition in which the LCO does not apply. Action must be immediately initiated to suspend operations with a potential for draining the reactor vessel (OPDRVs) to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended. If suspending an OPDRV would result in closing the residual heat removal (RHR) shutdown cooling isolation valves, an

(continued)

ACTIONS

F.1 and F.2 (continued)

alternative Required Action is provided to immediately initiate action to restore the valve(s) to OPERABLE status. This allows RHR shutdown cooling to remain in service while actions are being taken to restore the valve.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.1

This SR ensures that the 18 inch primary containment vent and purge valves are closed as required or, if open, opened for an allowable reason. If a vent or purge valve is opened in violation of this SR, the valve is considered inoperable. The torus purge valve, 1601-56, is normally open for pressure control, therefore this valve is excluded from this SR. However, this is acceptable since this valve is designed to automatically close on LOCA conditions. The SR is modified by a Note stating that the SR is not required to be met when the vent or purge valves are open for the stated reasons. The Note states that these valves may be opened for inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, or Surveillances that require the valves to be open provided the drywell vent and purge valves and their associated suppression chamber vent and purge valves are not open simultaneously. The 18 inch vent and purge valves are capable of closing in the environment following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other PCIV requirements discussed in SR 3.6.1.3.2.

SR 3.6.1.3.2

This SR verifies that each primary containment isolation manual valve and blind flange that is located outside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions, is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.2 (continued)

This SR does not require any testing or valve manipulation. Rather, it involves verification that those PCIVs outside primary containment, and capable of being mispositioned, are in the correct position. Since verification of position for PCIVs outside primary containment is relatively easy, the 31 day Frequency was chosen to provide added assurance that the PCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these valves were verified to be in the correct position upon locking, sealing, or securing.

Two Notes have been added to this SR. The first Note allows valves and blind flanges located in high radiation areas to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable since access to these areas is typically restricted for ALARA reasons. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in the proper position, is low. A second Note has been included to clarify that PCIVs open under administrative controls are not required to meet the SR during the time that the PCIVs are open. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

SR 3.6.1.3.3

This SR verifies that each primary containment manual isolation valve and blind flange located inside primary containment and not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design limits. For PCIVs inside primary containment, the Frequency "prior to entering MODE 2 or 3 from MODE 4 if primary containment was de-inerted while in MODE 4, if not performed within the previous 92 days" is appropriate since these PCIVs are

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.3 (continued)

operated under administrative controls and the probability of their misalignment is low. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these valves were verified to be in the correct position upon locking, sealing, or securing.

Two Notes have been added to this SR. The first Note allows valves and blind flanges located in high radiation areas to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable since the primary containment is inerted and access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these PCIVs, once they have been verified to be in their proper position, is low. A second Note has been included to clarify that PCIVs that are open under administrative controls are not required to meet the SR during the time that the PCIVs are open. These controls consist of stationing a dedicated operator at the controls of the valve, who is in continuous communication with the control room. In this way the penetration can be rapidly isolated when a need for primary containment isolation is indicated.

SR 3.6.1.3.4

The traversing incore probe (TIP) shear isolation valves are actuated by explosive charges. Surveillance of explosive charge continuity provides assurance that TIP valves will actuate when required. Other administrative controls, such as those that limit the shelf life of the explosive charges, must be followed. The 31 day Frequency is based on operating experience that has demonstrated the reliability of the explosive charge continuity.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.5

Verifying the isolation time of each power operated, automatic PCIV is within limits is required to demonstrate OPERABILITY. MSIVs may be excluded from this SR since MSIV full closure isolation time is demonstrated by SR 3.6.1.3.6. The isolation time test ensures that each valve will isolate in a time period less than or equal to that assumed in the safety analyses. The Frequency of this SR is in accordance with the requirements of the Inservice Testing Program.

SR 3.6.1.3.6

Verifying that the isolation time of each MSIV is within the specified limits is required to demonstrate OPERABILITY. The isolation time test ensures that the MSIV will isolate in a time period that does not exceed the times assumed in the DBA and transient analyses. This ensures that the calculated radiological consequences of these events remain within 10 CFR 100 limits. The Frequency of this SR is in accordance with the requirements of the Inservice Testing Program.

SR 3.6.1.3.7

Automatic PCIVs close on a primary containment isolation signal to prevent leakage of radioactive material from primary containment following a DBA. This SR ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.1, "Primary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. The 24 month Frequency was developed considering it is prudent that this Surveillance be performed only during a unit outage since isolation of penetrations would eliminate cooling water flow and disrupt the normal operation of many critical components. Operating experience has shown that these components usually pass this Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.8

This SR requires a demonstration that each reactor instrumentation line excess flow check valve (EFCV) is OPERABLE by verifying that the valve actuates to the isolation position on an actual or simulated instrument line break condition. This test is performed by blowing down the instrument line during an inservice leak or hydrostatic test and verifying a distinctive "click" when the poppet valve seats or a quick reduction in flow. This SR provides assurance that the instrumentation line EFCVs will perform as designed. The 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 that these components usually pass this Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.1.3.9

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. The Frequency of 24 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the frequent checks of circuit continuity (SR 3.6.1.3.4). Other administrative controls, such as those that limit the shelf life and operating life, as applicable, of the explosive charges must be followed.

SR 3.6.1.3.10

The analyses in References 2 and 3 are based on leakage that is less than the specified leakage rate. The combined leakage rate for all MSIV leakage paths is $\leq$ 46 scfh when tested at $\geq$ 25 psig. The leakage rate of each main steam

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.3.10 (continued)

isolation valve path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves). If both isolation valves in the penetration are closed the actual leakage rate is the lesser leakage rate of the two valves. This method of quantifying leakage is only to be used for this SR (i.e., Appendix J maximum pathway leakage limits are to be quantified in accordance with the Primary Containment Leakage Rate Testing Program). This ensures that MSIV leakage is properly accounted for in determining the overall primary containment leakage rate. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

MSIV leakage is considered part of L_a.

REFERENCES

1. Technical Requirements Manual.
2. UFSAR, Section 15.6.5.
3. UFSAR, Section 15.6.4.
4. UFSAR, Chapter 15.
5. UFSAR, Section 5.2.2.2.3.
6. UFSAR, Section 6.2.4.1.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.4 Drywell Pressure

BASES

BACKGROUND	The drywell pressure is limited during normal operations to preserve the initial conditions assumed in the accident analysis for a Design Basis Accident (DBA) or loss of coolant accident (LOCA).
APPLICABLE SAFETY ANALYSES	Primary containment performance is evaluated for the entire spectrum of break sizes for postulated LOCAs (Ref. 1). Among the inputs to the DBA is the initial primary containment internal pressure (Ref. 1). Analyses assume an initial drywell pressure of 1.5 psig. This limitation ensures that the safety analysis remains valid by maintaining the expected initial conditions and ensures that the peak LOCA drywell internal pressure does not exceed the maximum allowable of 62 psig. The maximum calculated drywell pressure occurs during the reactor blowdown phase of the DBA, which assumes an instantaneous recirculation line break. The calculated peak drywell pressure for this limiting event is [47] psig (Ref. 1). Drywell pressure satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).
LCO	In the event of a DBA, with an initial drywell pressure $\leq$ 1.5 psig, the resultant peak drywell accident pressure will be maintained below the drywell design pressure.
APPLICABILITY	In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining drywell pressure within limits is not required in MODE 4 or 5.

(continued)

BASES (continued)

ACTIONS

A.1

With drywell pressure not within the limit of the LCO, drywell pressure must be restored within 1 hour. The Required Action is necessary to return operation to within the bounds of the primary containment analysis. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, "Primary Containment," which requires that primary containment be restored to OPERABLE status within 1 hour.

B.1 and B.2

If drywell pressure cannot be restored to within the limit within the required Completion Time, 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

SR 3.6.1.4.1

Verifying that drywell pressure is within the limit ensures that unit operation remains within the limit assumed in the primary containment analysis. The 12 hour Frequency of this SR was developed, based on operating experience related to trending of drywell pressure variations during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal drywell pressure condition.

REFERENCES

1. UFSAR, Section 6.2.1.3.2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.5 Drywell Air Temperature

BASES

BACKGROUND	The drywell contains the reactor vessel and piping, which add heat to the airspace. Drywell coolers remove heat and maintain a suitable environment. The average airspace temperature affects the calculated response to postulated Design Basis Accidents (DBAs). The limitation on the drywell average air temperature was developed as reasonable, based on operating experience. The limitation on drywell air temperature is used in the Reference 1 safety analyses.
APPLICABLE SAFETY ANALYSES	Primary containment performance is evaluated for a spectrum of break sizes for postulated loss of coolant accidents (LOCAs) (Ref. 1). Among the inputs to the design basis analysis is the initial drywell average air temperature (Ref. 1). Analyses assume an initial average drywell air temperature of 150°F. This limitation ensures that the safety analysis remains valid by maintaining the expected initial conditions and ensures that the peak LOCA drywell temperature does not exceed the maximum allowable temperature of 281°F (Ref. 2). Exceeding this design temperature may result in the degradation of the primary containment structure under accident loads. Equipment inside primary containment required to mitigate the effects of a DBA is designed to operate and be capable of operating under environmental conditions expected for the accident. Drywell air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).
LCO	In the event of a DBA, with an initial drywell average air temperature less than or equal to the LCO temperature limit, the resultant peak accident temperature is maintained below the drywell design temperature. As a result, the ability of primary containment to perform its design function is ensured.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, maintaining drywell average air temperature within the limit is not required in MODE 4 or 5.

ACTIONS

A.1

With drywell average air temperature not within the limit of the LCO, drywell average air temperature must be restored within 8 hours. The Required Action is necessary to return operation to within the bounds of the primary containment analysis. The 8 hour Completion Time is acceptable, considering the sensitivity of the analysis to variations in this parameter, and provides sufficient time to correct minor problems.

B.1 and B.2

If the drywell average air temperature cannot be restored to within the limit within the required Completion Time, 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

SR 3.6.1.5.1

Verifying that the drywell average air temperature is within the LCO limit ensures that operation remains within the limits assumed for the primary containment analyses. Drywell air temperature is monitored in various quadrants and at various elevations (referenced to mean sea level) selected to provide a representative sample of the overall drywell atmosphere. Due to the shape of the drywell, a volumetric average is used to determine an accurate representation of the actual average temperature.

(continued)

BASES

SURVEILLANCE REQUIREMENT

SR 3.6.1.5.1 (continued)

The 24 hour Frequency of the SR was developed based on operating experience related to drywell average air temperature variations and temperature instrument drift during the applicable MODES and the low probability of a DBA occurring between surveillances. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal drywell air temperature condition.

REFERENCES

1. UFSAR, Section 6.2.1.3.

2. UFSAR, Table 6.2-1.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.6 Low Set Relief Valves

BASES

BACKGROUND

The relief valves can actuate in either the relief mode, the Automatic Depressurization System mode, or the low set relief mode. In addition, one relief valve is designed to open in the safety mode. (However, for the purposes of this LCO, only the low set relief mode of the relief valves is required.) For Unit 1, the low set relief valves are of the Electromatic type. The main valve is operated by a pilot valve assembly which is actuated by a solenoid. This solenoid can be automatically energized by an automatic depressurization logic signal or by pressure switches in the low set relief mode. Opening the pilot valve allows a differential pressure to develop across the main valve disc and opens the main valve. The main valve can stay partially open with valve inlet steam pressure as low as 50 psig. However, with inlet steam pressure below 150 psig steam pressure will not be sufficient to hold the main valve fully open against the spring force of the main valve spring. For Unit 2, the low set relief valves are of the Target Rock type. When the solenoid is energized, a magnetic force is developed which moves a plunger upward until it contacts the moveable core. This motion is transmitted through the pilot rod to fully open two pilot discs, allowing the control pressure above the main disc to vent through the second pilot seat to the downstream side of the valve. In addition, the motion of the pilot discs partially reduces the control pressure above the main disc. When the force of the control pressure acting on the top of the main disc falls below the force of the inlet pressure acting on the lower annular area, the main disc will move to the open position. In the open position, with the moveable core positioned close to the fixed core, the magnetic force is well in excess of the closing forces due to control pressure and return spring force. This ensures that the main disc will be held firmly in the open position. The main disc can be opened even with the valve inlet pressure equal to 0 psig.

Two of the relief valves are equipped to provide the low set relief function. The low set relief setpoints cause the low set relief valves to be opened at a lower pressure than

(continued)

BASES

BACKGROUND (continued)	the other relief valves and stay open longer, so that reopening more than two relief valves is prevented on subsequent actuations. Therefore, the low set relief function prevents excessive short duration relief valve cycles with valve actuation at the low set relief setpoint. Each relief valve discharges steam through a discharge line and quencher to a location near the bottom of the suppression pool, which causes a load on the suppression pool wall. Actuation at lower reactor pressure results in a lower load. A time delay in the low set relief valve logic prevents actuation concurrent with an elevated water level in the discharge line.
APPLICABLE SAFETY ANALYSES	The low set relief mode functions to ensure that the containment design basis of no more than two relief valve operating on "subsequent actuations" is met. In other words, multiple simultaneous openings of relief valves (following the initial opening), and the corresponding higher loads, are avoided. The safety analysis demonstrates that the low set relief functions to avoid the induced thrust loads on the relief valve discharge line resulting from "subsequent actuations" of the relief valve during Design Basis Accidents (DBAs). Even though two low set relief valves are specified, only one low set relief valve is required to operate in any DBA analysis. Low set relief valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Two low set relief valves are required to be OPERABLE to satisfy the assumptions of the safety analyses (Ref. 1). The requirements of this LCO are applicable to the mechanical and electrical capability of the low set relief valves to function for controlling the opening and closing of the low set relief valves.
APPLICABILITY	In MODES 1, 2, and 3, an event could cause pressurization of the reactor and opening of relief valves. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the low set relief valves OPERABLE is not required in MODE 4 or 5.

(continued)

BASES (continued)

ACTIONS

A.1

With one low set relief valve inoperable, the remaining OPERABLE low set relief valve is adequate to perform the designed function. However, the overall reliability is reduced. The 14 day Completion Time takes into account the redundant capability afforded by the remaining low set relief valve and the low probability of an event occurring during this period in which the remaining low set relief valve capability would be required.

B.1 and B.2

If two low set relief valves are inoperable or if the inoperable low set relief valve cannot be restored to OPERABLE status within the required Completion Time, 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

SR 3.6.1.6.1

A manual actuation of each low set relief valve is performed to verify that the valve and solenoids are functioning properly and no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control or bypass valve, by a change in the measured steam flow, or by any other method that is suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the low set relief valves divert steam flow upon opening. Sufficient time is therefore allowed, after the required pressure and flow are achieved, to perform this test. Adequate pressure at which this test is to be performed is $\geq$ 300 psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by at least 2 turbine bypass valves open.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.6.1 (continued)

The 24 month Frequency was based on the relief valve tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 2). The Frequency of 24 months ensures that each solenoid for each low set relief valve is tested. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Unit startup is allowed prior to performing the test because valve OPERABILITY is verified by Reference 2 prior to valve installation. The 12 hours allowed for manual actuation after the required pressure and flow is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR.

SR 3.6.1.6.2

The low set relief designated relief valves are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the low set relief function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.3, "Low Set Relief Valve Instrumentation," overlaps this SR to provide complete testing of the safety function.

The 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 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

(continued)

BASES (continued)

REFERENCES

1. UFSAR, Section 6.2.1.3.4.2.
2. ASME, Boiler and Pressure Vessel Code, Section XI.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.7 Reactor Building-to-Suppression Chamber Vacuum Breakers

BASES

BACKGROUND

The function of the reactor building-to-suppression chamber vacuum breakers is to relieve vacuum when primary containment depressurizes below reactor building pressure. If the drywell depressurizes below reactor building pressure, the negative differential pressure is mitigated by flow through the reactor building-to-suppression chamber vacuum breakers and through the suppression-chamber-to-drywell vacuum breakers. The design of the external (reactor building-to-suppression chamber) vacuum relief provisions consists of two vacuum breakers (a mechanical vacuum breaker and an air operated butterfly valve), located in series in each of two parallel 20 inch lines connected to a common 20 inch inlet line from the reactor building. The two parallel 20 inch vacuum breaker lines connect to a common 20 inch line, which, in turn, connects to the suppression chamber airspace. The butterfly valve is actuated by a differential pressure switch. The mechanical vacuum breaker is self actuating (similar to a check valve) and can be locally operated for testing purposes. The two vacuum breakers in series must be closed to maintain a leak tight primary containment boundary.

A negative differential pressure across the drywell wall is caused by rapid depressurization of the drywell. Events that cause this rapid depressurization are cooling cycles, inadvertent primary containment spray actuation, and steam condensation in the event of a primary system rupture. Reactor building-to-suppression chamber vacuum breakers prevent an excessive negative differential pressure across the primary containment boundary. Cooling cycles result in minor pressure transients in the drywell, which occur slowly and are normally controlled by heating and ventilation equipment. Inadvertent spray actuation results in a more significant pressure transient and becomes important in sizing the external (reactor building-to-suppression chamber) vacuum breakers.

The external vacuum breakers are sized on the basis of the air flow from the secondary containment that is required to mitigate the depressurization transient and limit the

(continued)

BASES

BACKGROUND (continued)	maximum negative containment (drywell and suppression chamber) pressure to within design limits. The maximum depressurization rate is a function of the primary containment spray flow rate and temperature and the assumed initial conditions of the primary containment atmosphere. Low spray temperatures and atmospheric conditions that yield the minimum amount of contained noncondensible gases are assumed for conservatism.
APPLICABLE SAFETY ANALYSES	Analytical methods and assumptions involving the reactor building-to-suppression chamber vacuum breakers are presented in Reference 1 as part of the accident response of the containment systems. Internal (suppression-chamber-to-drywell) and external (reactor building-to-suppression chamber) vacuum breakers are provided as part of the primary containment to limit the negative differential pressure across the drywell and suppression chamber walls, which form part of the primary containment boundary. The safety analyses assume the external vacuum breakers to be closed initially, with the mechanical vacuum breakers counter balanced to open at 0.5 psid and to be fully open in one second. The air operated butterfly valve vacuum breakers are assumed to open concurrent with the mechanical vacuum breakers and be full open in one second (Ref. 1). Since only one of the two parallel 20 inch vacuum breaker lines is required to protect the suppression chamber from excessive negative differential pressure, the single active failure criterion is satisfied. Design Basis Accident (DBA) analyses assume the vacuum breakers to be closed initially and that at least one vacuum breaker in each line remains closed and leak tight with positive primary containment pressure. The reactor building-to-suppression chamber vacuum breakers satisfy 10 CFR 50.36(c)(2)(ii).
LCO	All reactor building-to-suppression chamber vacuum breakers are required to be OPERABLE to satisfy the assumptions used in the safety analyses. The requirement ensures that the two vacuum breakers (mechanical vacuum breaker and air operated butterfly valve) in each of the two lines from the

(continued)

BASES

LCO (continued)

reactor building to the suppression chamber airspace are closed (except during testing or when performing their intended function). Also, the requirement ensures both vacuum breakers in each line will open to relieve a negative pressure in the suppression chamber.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could result in excessive negative differential pressure across the drywell wall caused by the rapid depressurization of the drywell. The event that results in the limiting rapid depressurization of the drywell is the primary system rupture, which purges the drywell of air and fills the drywell free airspace with steam. Subsequent condensation of the steam would result in depressurization of the drywell, which, after the suppression chamber-to-drywell vacuum breakers open (due to excessive differential pressure between the suppression chamber and drywell), would result in depressurization of the suppression chamber. The limiting pressure and temperature of the primary system prior to a DBA occur in MODES 1, 2, and 3. Excessive negative pressure inside primary containment could occur due to inadvertent initiation of drywell sprays.

In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining reactor building-to-suppression chamber vacuum breakers OPERABLE is not required in MODE 4 or 5.

ACTIONS

A Note has been added to provide clarification that, for the purpose of this LCO, separate Condition entry is allowed for each reactor building-to-suppression chamber vacuum breaker line.

A.1

With one or more lines with one vacuum breaker not closed, the leak tight primary containment boundary may be threatened. Therefore, the inoperable vacuum breakers must be restored to OPERABLE status or the open vacuum breaker closed within 7 days. The 7 day Completion Time takes into account the redundancy capability afforded by the remaining

(continued)

BASES

ACTIONS

A.1 (continued)

breakers, the fact that the OPERABLE breaker in each of the lines is closed, and the low probability of an event occurring that would require the vacuum breakers to be OPERABLE during this period.

B.1

With one or more lines with two vacuum breakers not closed, primary containment integrity is not maintained. Therefore, one open vacuum breaker must be closed within 1 hour. This Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, "Primary Containment," which requires that primary containment be restored to OPERABLE status within 1 hour.

C.1

With one line with one or more vacuum breakers inoperable for opening, the leak tight primary containment boundary is intact. The ability to mitigate an event that causes a containment depressurization is threatened, however, if both vacuum breakers in at least one vacuum breaker penetration are not OPERABLE. Therefore, the inoperable vacuum breaker must be restored to OPERABLE status within 7 days. This is consistent with the Completion Time for Condition A and the fact that the leak tight primary containment boundary is being maintained.

D.1

With two lines with one or more vacuum breakers inoperable for opening, the primary containment boundary is intact. However, in the event of a containment depressurization, the function of the vacuum breakers is lost. Therefore, all vacuum breakers in one line must be restored to OPERABLE status within 1 hour. This Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, which requires that primary containment be restored to OPERABLE status within 1 hour.

(continued)

BASES

ACTIONS (continued)

E.1 and E.2

If any Required Action and associated Completion time can not be 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 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

SR 3.6.1.7.1

Each vacuum breaker is verified to be closed to ensure that a potential breach in the primary containment boundary is not present. This Surveillance is performed by observing local or control room indications of vacuum breaker position. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.

Two Notes are added to this SR. The first Note allows reactor-to-suppression chamber vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers. The second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.1.7.2

Each vacuum breaker must be cycled to ensure that it opens properly to perform its design function and returns to its fully closed position. This ensures that the safety analysis assumptions are valid. The 92 day Frequency of this SR was developed based upon Inservice Testing Program requirements to perform valve testing at least once every 92 days.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.7.3

Demonstration of vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of $\leq$ 0.5 psid is valid. The 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. For this plant, the 24 month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.

REFERENCES

1. UFSAR, Section 6.2.1.2.4.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.8 Suppression Chamber-to-Drywell Vacuum Breakers

BASES

BACKGROUND

The function of the suppression chamber-to-drywell vacuum breakers is to relieve vacuum in the drywell. There are 12 internal vacuum breakers located on the vent header of the vent system between the drywell and the suppression chamber, which allow air and steam flow from the suppression chamber to the drywell when the drywell is at a negative pressure with respect to the suppression chamber. Therefore, suppression chamber-to-drywell vacuum breakers prevent an excessive negative differential pressure across the suppression chamber-drywell boundary. Each vacuum breaker is a self actuating valve, similar to a check valve, which can be remotely operated for testing purposes.

A negative differential pressure across the drywell wall is caused by rapid depressurization of the drywell. Events that cause this rapid depressurization are cooling cycles, inadvertent drywell spray actuation, and steam condensation from sprays or subcooled water reflood of a break in the event of a primary system rupture. Cooling cycles result in minor pressure transients in the drywell that occur slowly and are normally controlled by heating and ventilation equipment. Spray actuation or spill of subcooled water out of a break results in more significant pressure transients and becomes important in sizing the internal vacuum breakers.

In the event of a primary system rupture, steam condensation within the drywell results in the most severe pressure transient. Following a primary system rupture, air in the drywell is purged into the suppression chamber free airspace, leaving the drywell full of steam. Subsequent condensation of the steam can be caused in two possible ways, namely, Emergency Core Cooling Systems flow from a recirculation line break, or drywell spray actuation following a loss of coolant accident (LOCA). These two cases determine the maximum depressurization rate of the drywell.

(continued)

BASES

BACKGROUND (continued)

In addition, the waterleg in the Mark I Vent System downcomer is controlled by the drywell-to-suppression chamber differential pressure. If the drywell pressure is less than the suppression chamber pressure, there will be an increase in the vent waterleg. This will result in an increase in the water clearing inertia in the event of a postulated LOCA, resulting in an increase in the peak drywell pressure. This in turn will result in an increase in the pool swell dynamic loads. The internal vacuum breakers limit the height of the waterleg in the vent system during normal operation.

APPLICABLE SAFETY ANALYSES

Analytical methods and assumptions involving the suppression chamber-to-drywell vacuum breakers are presented in Reference 1 as part of the accident response of the primary containment systems. Internal (suppression chamber-to-drywell) and external (reactor building-to-suppression chamber) vacuum breakers are provided as part of the primary containment to limit the negative differential pressure across the drywell and suppression chamber walls that form part of the primary containment boundary.

The safety analyses assume that the internal vacuum breakers are closed initially and are fully open at a differential pressure of 0.5 psid (Ref. 2). Additionally, 5 of the 12 internal vacuum breakers are assumed to fail in a closed position (Ref. 1). The results of the analyses show that the design pressure is not exceeded even under the worst case accident scenario. The vacuum breaker opening differential pressure setpoint and the OPERABILITY of 7 of 12 vacuum breakers are a result of the requirement placed on the vacuum breakers to limit the vent system waterleg height. However, this requirement is conservative. The vacuum breakers are sized on the basis of the Bodega pressure suppression system tests. These tests were conducted by simulating a small break LOCA, which tend to cause vent system waterleg height variations. The vacuum breaker capacity selected is more than adequate to limit the pressure differential between the suppression chamber and drywell post LOCA with the valves set to operate at 0.5 psid differential pressure. Design Basis Accident (DBA) analyses assume the vacuum breakers to be closed initially and to remain closed and leak tight until the suppression chamber is at a positive pressure relative to the drywell.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	The suppression chamber-to-drywell vacuum breakers satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Only 9 of the 12 vacuum breakers must be OPERABLE for opening to provides assurance that the vacuum breakers will open so that drywell-to-suppression chamber negative differential pressure remains below the design value. This LCO also ensures that all suppression chamber-to-drywell vacuum breakers are closed (except during testing or when the vacuum breakers are performing their intended design function). The requirement that the vacuum breakers be closed ensures that there is no excessive bypass leakage should a LOCA occur.
APPLICABILITY	In MODES 1, 2, and 3, a DBA could result in excessive negative differential pressure across the drywell wall, caused by the rapid depressurization of the drywell. The event that results in the limiting rapid depressurization of the drywell is the primary system rupture that purges the drywell of air and fills the drywell free airspace with steam. Subsequent condensation of the steam would result in depressurization of the drywell, which, after the suppression chamber-to-drywell vacuum breakers open (due to excessive differential pressure between the suppression chamber and drywell), would result in depressurization of the suppression chamber. The limiting pressure and temperature of the primary system prior to a DBA occur in MODES 1, 2, and 3. Excessive negative pressure inside the drywell could occur due to inadvertent actuation of drywell sprays. In MODES 4 and 5, the probability and consequences of these events are reduced by the pressure and temperature limitations in these MODES; therefore, maintaining suppression chamber-to-drywell vacuum breakers OPERABLE is not required in MODE 4 or 5.
ACTIONS	<u>A.1</u> With one of the required vacuum breakers inoperable for opening (e.g., a vacuum breaker is not open and may be stuck closed or not within its opening setpoint limit, so that it

(continued)

BASES

ACTIONS

A.1 (continued)

would not function as designed during an event that depressurized the drywell), the remaining eight OPERABLE vacuum breakers are capable of providing the vacuum relief function. However, overall system reliability is reduced because additional failures in the remaining vacuum breakers could result in an excessive suppression chamber-to-drywell differential pressure during a DBA. Therefore, with one of the nine required vacuum breakers inoperable, 72 hours is allowed to restore at least one of the inoperable vacuum breakers to OPERABLE status so that plant conditions are consistent with the LCO requirements. The 72 hour Completion Time is considered acceptable due to the low probability of an event in which the remaining vacuum breaker capability would not be adequate.

B.1

With one vacuum breaker not closed, communication between the drywell and suppression chamber airspace exists, and, as a result, there is the potential for primary containment overpressurization due to this bypass leakage if a LOCA were to occur. Therefore, the open vacuum breaker must be closed. A short time is allowed to close the vacuum breaker due to the low probability of an event that would pressurize primary containment. If vacuum breaker position indication is not reliable, an alternate method of verifying that the vacuum breakers are closed is to verify that a differential pressure of 0.5 psid between the suppression chamber and drywell is maintained for 1 hour without makeup. The required 4 hour Completion Time is considered adequate to perform this test.

C.1 and C.2

If any Required Action and associated Completion Time cannot be 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 and to MODE 4

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

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

SR 3.6.1.8.1

Each vacuum breaker is verified closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker position indication or by verifying that a differential pressure of 0.5 psid between the suppression chamber and drywell is maintained for 1 hour. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.

Two Notes are added to this SR. The first Note allows suppression chamber-to-drywell vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers. The second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.1.8.2

Each required vacuum breaker must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This ensures that the safety analysis assumptions are valid. The 31 day Frequency of this SR was developed, based on Inservice Testing Program requirements to perform valve testing at least once every 92 days. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers are OPERABLE. In addition, this functional test is required within 12 hours after a discharge of steam to the suppression chamber from the relief valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.8.3

Verification of the vacuum breaker opening setpoint from the closed position is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of ≤ 0.5 psid is valid. The 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. The 24 month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.

REFERENCES

1. UFSAR, Section 6.2.1.2.4.1.
2. UFSAR, Table 6.2-1.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.1 Suppression Pool Average Temperature

BASES

BACKGROUND

The suppression chamber is a toroidal shaped, steel pressure vessel containing a volume of water called the suppression pool. The suppression pool is designed to absorb the decay heat and sensible energy released during a reactor blowdown from relief valve discharges or from Design Basis Accidents (DBAs). The suppression pool must quench all the steam released through the downcomer lines during a loss of coolant accident (LOCA). This is the essential mitigative feature of a pressure suppression containment that ensures that the peak containment pressure is maintained below the maximum allowable pressure for DBAs (62 psig). The suppression pool must also condense steam from steam exhaust lines in the turbine driven systems (i.e., the High Pressure Coolant Injection System and Reactor Core Isolation Cooling System). Suppression pool average temperature (along with LCO 3.6.2.2, "Suppression Pool Water Level") is a key indication of the capacity of the suppression pool to fulfill these requirements.

The technical concerns that lead to the development of suppression pool average temperature limits are as follows:

a. Complete steam condensation;

b. Primary containment peak pressure and temperature;

c. Condensation oscillation loads; and

d. Chugging loads.

APPLICABLE SAFETY ANALYSES

The postulated DBA against which the primary containment performance is evaluated is the entire spectrum of postulated pipe breaks within the primary containment. Inputs to the safety analyses include initial suppression pool water volume and suppression pool temperature (Reference 1 for LOCAs and Reference 2 for the pool temperature analyses required by Reference 3). An initial pool temperature of 95°F is assumed for the Reference 1, 2, and 4 analyses. Reactor shutdown at a pool temperature of

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

110°F and vessel depressurization at a pool temperature of 120°F are assumed for the Reference 2 analyses. The limit of 105°F, at which testing is terminated, is not used in the safety analyses because DBAs are assumed to not initiate during unit testing.

Suppression pool average temperature satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).

LCO

A limitation on the suppression pool average temperature is required to provide assurance that the containment conditions assumed for the safety analyses are met. This limitation subsequently ensures that peak primary containment pressures and temperatures do not exceed maximum allowable values during a postulated DBA or any transient resulting in heatup of the suppression pool. The LCO requirements are:

a. Average temperature ≤ 95°F with THERMAL POWER > 1% RTP and no testing that adds heat to the suppression pool is being performed. This requirement ensures that licensing bases initial conditions are met.

b. Average temperature ≤ 105°F with THERMAL POWER > 1% RTP and testing that adds heat to the suppression pool is being performed. This required value ensures that the unit has testing flexibility, and was selected to provide margin below the 110°F limit at which reactor shutdown is required. When testing ends, temperature must be restored to ≤ 95°F within 24 hours according to Required Action A.2. Therefore, the time period that the temperature is > 95°F is short enough not to cause a significant increase in unit risk.

c. Average temperature ≤ 110°F with THERMAL POWER ≤ 1% RTP. This requirement ensures that the unit will be shut down at > 110°F. The pool is designed to absorb decay heat and sensible heat but could be heated beyond design limits by the steam generated if the reactor is not shut down.

At 1% RTP, heat input is approximately equal to normal system heat losses.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause significant heatup of the suppression pool. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining suppression pool average temperature within limits is not required in MODE 4 or 5.

ACTIONS

A.1 and A.2

With the suppression pool average temperature above the specified limit when not performing testing that adds heat to the suppression pool and when above the specified power limit, the initial conditions exceed the conditions assumed for the Reference 1, 2, and 4 analyses. However, primary containment cooling capability still exists, and the primary containment pressure suppression function will occur at temperatures well above those assumed for safety analyses. Therefore, continued operation is allowed for a limited time. The 24 hour Completion Time is adequate to allow the suppression pool average temperature to be restored below the limit. Additionally, when suppression pool temperature is > 95°F, increased monitoring of the suppression pool temperature is required to ensure that it remains ≤ 110°F. The once per hour Completion Time is adequate based on past experience, which has shown that pool temperature increases relatively slowly except when testing that adds heat to the suppression pool is being performed. Furthermore, the once per hour Completion Time is considered adequate in view of other indications in the control room to alert the operator to an abnormal suppression pool average temperature condition.

B.1

If the suppression pool average temperature cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the power must be reduced to ≤ 1% RTP within 12 hours. The 12 hour Completion Time is reasonable, based on operating experience, to reduce power from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

C.1

Suppression pool average temperature is allowed to be > 95°F with THERMAL POWER > 1% RTP, and when testing that adds heat to the suppression pool is being performed. However, if temperature is > 105°F, all testing must be immediately suspended to preserve the heat absorption capability of the suppression pool. With the testing suspended, Condition A is entered and the Required Actions and associated Completion Times are applicable.

D.1 and D.2

Suppression pool average temperature > 110°F requires that the reactor be shut down immediately. This is accomplished by placing the reactor mode switch in the shutdown position. Further cooldown to MODE 4 within 36 hours is required at normal cooldown rates (provided pool temperature remains ≤ 120°F). Additionally, when suppression pool temperature is > 110°F, increased monitoring of pool temperature is required to ensure that it remains ≤ 120°F. The once per 30 minute Completion Time is adequate, based on operating experience. Given the high suppression pool average temperature in this condition, the monitoring Frequency is increased to twice that of Condition A. Furthermore, the 30 minute Completion Time is considered adequate in view of other indications available in the control room to alert the operator to an abnormal suppression pool average temperature condition.

E.1 and E.2

If suppression pool average temperature cannot be maintained at ≤ 120°F, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the reactor pressure must be reduced to < 150 psig within 12 hours, and the plant must be brought to at least 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.

(continued)

BASES

ACTIONS

E.1 and E.2 (continued)

Continued addition of heat to the suppression pool with suppression pool temperature > 120°F could result in exceeding the design basis maximum allowable values for primary containment temperature or pressure. Furthermore, if a blowdown were to occur when the temperature was > 120°F, the maximum allowable bulk and local temperatures could be exceeded very quickly.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1.1

The suppression pool average temperature is regularly monitored to ensure that the required limits are satisfied. The average temperature is determined by taking an arithmetic average of OPERABLE suppression pool water temperature channels. The 24 hour Frequency has been shown, based on operating experience, to be acceptable. When heat is being added to the suppression pool by testing, however, it is necessary to monitor suppression pool temperature more frequently. The 5 minute Frequency during testing is justified by the rates at which tests will heat up the suppression pool, has been shown to be acceptable based on operating experience, and provides assurance that allowable pool temperatures are not exceeded. The Frequencies are further justified in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool average temperature condition.

REFERENCES

1. UFSAR, Section 6.2.
2. UFSAR, Chapter 6.2.1.3.4.5.
3. NUREG-0783.
4. Quad Cities Nuclear Power Station Units 1 and 2, Mark 1 Plant Unique Analysis Report, COM-02-039-1, May 1983.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.2 Suppression Pool Water Level

BASES

BACKGROUND

The suppression chamber is a toroidal shaped, steel pressure vessel containing a volume of water called the suppression pool. The suppression pool is designed to absorb the energy associated with decay heat and sensible heat released during a reactor blowdown from relief valve discharges or from a Design Basis Accident (DBA). The suppression pool must quench all the steam released through the downcomer lines during a loss of coolant accident (LOCA). This is the essential mitigative feature of a pressure suppression containment, which ensures that the peak containment pressure is maintained below the maximum allowable pressure for DBAs (62 psig). The suppression pool must also condense steam from the steam exhaust lines in the turbine driven systems (i.e., High Pressure Coolant Injection (HPCI) System and Reactor Core Isolation Cooling (RCIC) System) and provides the main emergency water supply source for the reactor vessel. The suppression pool volume ranges between approximately 111,500 ft^3 at the low water level limit of 14 ft 1 inch and approximately 115,000 ft^3 at the high water level limit of 14 ft 5 inches.

If the suppression pool water level is too low, an insufficient amount of water would be available to adequately condense the steam from the relief valve quenchers, downcomer lines, or HPCI turbine exhaust line. Low suppression pool water level could also result in an inadequate emergency makeup water source to the Emergency Core Cooling System. The lower volume would also absorb less steam energy before heating up excessively. Therefore, a minimum suppression pool water level is specified.

If the suppression pool water level is too high, it could result in excessive clearing loads from relief valve discharges and excessive pool swell loads during a DBA LOCA. Therefore, a maximum pool water level is specified. This LCO specifies an acceptable range to prevent the suppression pool water level from being either too high or too low.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES	Initial suppression pool water level affects suppression pool temperature response calculations, calculated drywell pressure for a DBA, calculated pool swell loads for a DBA LOCA, and calculated loads due to relief valve discharges. Suppression pool water level must be maintained within the limits specified so that the safety analysis of Reference 1 remains valid. Suppression pool water level satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).
LCO	A limit that suppression pool water level be ≥ 14 ft 1 inch and ≤ 14 ft 5 inches above the bottom of the suppression chamber is required to ensure that the primary containment conditions assumed for the safety analyses are met. Either the high or low water level limits were used in the safety analyses, depending upon which is more conservative for a particular calculation.
APPLICABILITY	In MODES 1, 2, and 3, a DBA would cause significant loads on the primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. The requirements for maintaining suppression pool water level within limits in MODE 4 or 5 is addressed in LCO 3.5.2, "ECCS-Shutdown."
ACTIONS	<u>A.1</u> With suppression pool water level outside the limits, the conditions assumed for the safety analyses are not met. If water level is below the minimum level, the pressure suppression function still exists as long as the downcomers are covered, HPCI and RCIC turbine exhausts are covered, and relief valve quenchers are covered. If suppression pool water level is above the maximum level, protection against overpressurization still exists due to the margin in the peak containment pressure analysis and the capability of the Containment Spray System. Therefore, continued operation for a limited time is allowed. The 2 hour Completion Time is sufficient to restore suppression pool water level to within limits. Also, it takes into account the low probability of an event impacting the suppression pool water level occurring during this interval.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

If suppression pool water level cannot be restored to within limits within the required Completion Time, 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

SR 3.6.2.2.1

Verification of the suppression pool water level is to ensure that the required limits are satisfied. The 24 hour Frequency has been shown to be acceptable based on operating experience. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal suppression pool water level condition.

REFERENCES

1. UFSAR, Section 6.2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

BASES

BACKGROUND

Following a Design Basis Accident (DBA), the RHR Suppression Pool Cooling System removes heat from the suppression pool. The suppression pool is designed to absorb the sudden input of heat from the primary system. In the long term, the pool continues to absorb residual heat generated by fuel in the reactor core. Some means must be provided to remove heat from the suppression pool so that the temperature inside the primary containment remains within design limits. This function is provided by two redundant RHR suppression pool cooling subsystems. The purpose of this LCO is to ensure that both subsystems are OPERABLE in applicable MODES.

Each RHR suppression pool cooling subsystem contains two pumps and one heat exchanger and is manually initiated and independently controlled. The two subsystems perform the suppression pool cooling function by circulating water from the suppression pool through the RHR heat exchangers and returning it to the suppression pool. RHR service water, circulating through the tube side of the heat exchangers, exchanges heat with the suppression pool water and discharges this heat to the external heat sink.

The heat removal capability of one RHR pump in one subsystem is sufficient to meet the overall DBA pool cooling requirement for loss of coolant accidents (LOCAs) and transient events such as a turbine trip or stuck open relief valve. Relief valve leakage and High Pressure Coolant Injection and Reactor Core Isolation Cooling Systems testing increase suppression pool temperature more slowly. The RHR Suppression Pool Cooling System is also used to lower the suppression pool water bulk temperature following such events.

APPLICABLE SAFETY ANALYSES

Reference 1 contains the results of analyses used to predict primary containment pressure and temperature following large and small break LOCAs. The intent of the analyses is to demonstrate that the heat removal capacity of the RHR Suppression Pool Cooling System is adequate to maintain the

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	primary containment conditions within design limits. The suppression pool temperature is calculated to remain below the design limit. The RHR Suppression Pool Cooling System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	During a DBA, a minimum of one RHR suppression pool cooling subsystem is required to maintain the primary containment peak pressure and temperature below design limits (Ref. 1). To ensure that these requirements are met, two RHR suppression pool cooling subsystems must be OPERABLE with power from two safety related independent power supplies. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR suppression pool cooling subsystem is OPERABLE when one of the pumps, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE.
APPLICABILITY	In MODES 1, 2, and 3, a DBA could cause both a release of radioactive material to primary containment and a heatup and pressurization of primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, the RHR Suppression Pool Cooling System is not required to be OPERABLE in MODE 4 or 5.
ACTIONS	<u>A.1</u> With one RHR suppression pool cooling subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this condition, the remaining OPERABLE RHR suppression pool cooling subsystem is adequate to perform the primary containment cooling function. However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced primary containment cooling capability. The 7 day Completion Time is acceptable in light of the redundant RHR suppression pool cooling capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

(continued)

BASES

ACTIONS (continued)

B.1

With two RHR suppression pool cooling subsystems inoperable, one subsystem must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment pressure and temperature mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and the potential avoidance of a plant shutdown transient that could result in the need for the RHR suppression pool cooling subsystems to operate.

C.1 and C.2

If any Required Action and associated Completion Time cannot be 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 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

SR 3.6.2.3.1

Verifying the correct alignment for manual and power operated valves in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.3.1 (continued)

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

SR 3.6.2.3.2

Verifying that each required RHR pump develops a flow rate ≥ 5000 gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that the primary containment peak pressure and temperature can be maintained below the design limits during a DBA (Ref. 1). The flow is a normal test of centrifugal pump performance required by ASME Code, Section XI (Ref. 2). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice tests confirm component OPERABILITY, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

REFERENCES

1. UFSAR, Section 6.2.

2. ASME, Boiler and Pressure Vessel Code, Section XI.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.4 Residual Heat Removal (RHR) Suppression Pool Spray

BASES

BACKGROUND

Following a Design Basis Accident (DBA), the RHR Suppression Pool Spray System removes heat from the suppression chamber airspace. The suppression pool is designed to absorb the sudden input of heat from the primary system from a DBA or a rapid depressurization of the reactor pressure vessel (RPV) through relief valves. The heat addition to the suppression pool results in increased steam in the suppression chamber, which increases primary containment pressure. Steam blowdown from a DBA can also bypass the suppression pool and end up in the suppression chamber airspace. Some means must be provided to remove heat from the suppression chamber so that the pressure and temperature inside primary containment remain within analyzed design limits. This function is provided by two redundant suppression pool spray subsystems. The purpose of this LCO is to ensure that both subsystems are OPERABLE in applicable MODES.

Each of the two RHR suppression pool spray subsystems contains two pumps and one heat exchanger, which are manually initiated and independently controlled. The two subsystems perform the suppression pool spray function by circulating water from the suppression pool through the RHR heat exchangers and returning it to the suppression pool spray sparger. The sparger only accommodates a small portion of the total RHR pump flow; the remainder of the flow returns to the suppression pool through the suppression pool cooling return line or minimum flow line. Thus, both suppression pool cooling and suppression pool spray functions may be performed when the Suppression Pool Spray System is initiated. RHR service water, circulating through the tube side of the heat exchangers, exchanges heat with the suppression pool water and discharges this heat to the external heat sink. Either RHR suppression pool spray subsystem is sufficient to condense the steam from small bypass leaks from the drywell to the suppression chamber airspace during the postulated DBA.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

Reference 1 contains the results of analyses used to predict primary containment pressure and temperature following large and small break loss of coolant accidents. The intent of the analyses is to demonstrate that the pressure reduction capacity of the RHR Suppression Pool Spray System is adequate to maintain the primary containment conditions within design limits. The time history for primary containment pressure is calculated to demonstrate that the maximum pressure remains below the design limit.

The RHR Suppression Pool Spray System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

In the event of a DBA, a minimum of one RHR suppression pool spray subsystem is required to mitigate potential bypass leakage paths and maintain the primary containment peak pressure below the design limits (Ref. 1). To ensure that these requirements are met, two RHR suppression pool spray subsystems must be OPERABLE with power from two safety related independent power supplies. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR suppression pool spray subsystem is OPERABLE when one of the pumps, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could cause pressurization of primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining RHR suppression pool spray subsystems OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1

With one RHR suppression pool spray subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this condition, the remaining OPERABLE RHR suppression pool spray subsystem is adequate to perform the primary containment bypass leakage mitigation function.

(continued)

BASES

ACTIONS

A.1 (continued)

However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced primary containment bypass mitigation capability. The 7 day Completion Time was chosen in light of the redundant RHR suppression pool spray capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

B.1

With both RHR suppression pool spray subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment bypass leakage mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and because alternative methods to reduce pressure in the primary containment are available.

C.1 and C.2

If any Required Action and associated Completion Time cannot be 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 and 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

SR 3.6.2.4.1

Verifying the correct alignment for manual and power operated valves in the RHR suppression pool spray mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.4.1 (continued)

accident analysis. This is acceptable since the RHR suppression pool spray mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

SR 3.6.2.4.2

This Surveillance is performed every 5 years to verify that the spray nozzles are not obstructed and that spray flow will be provided when required. The 5 year Frequency is adequate to detect degradation in performance due to the passive nozzle design and has been shown to be acceptable through operating experience.

REFERENCES

1. UFSAR, Section 6.2.2.2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2.5 Drywell-to-Suppression Chamber Differential Pressure

BASES

BACKGROUND

The toroidal shaped suppression chamber, which contains the suppression pool, is connected to the drywell (part of the primary containment) by eight main vent pipes. The main vent pipes exhaust into a continuous vent header, from which 96 downcomer pipes extend into the suppression pool. The pipe exit is 3.21 ft below the minimum suppression pool water level required by LCO 3.6.2.2, "Suppression Pool Water Level." During a loss of coolant accident (LOCA), the increasing drywell pressure will force the waterleg in the downcomer pipes into the suppression pool at substantial velocities as the "blowdown" phase of the event begins. The length of the waterleg has a significant effect on the resultant primary containment pressures and loads.

APPLICABLE SAFETY ANALYSES

The purpose of maintaining the drywell at a slightly higher pressure with respect to the suppression chamber is to minimize the drywell pressure increase necessary to clear the downcomer pipes to commence condensation of steam in the suppression pool and to minimize the mass of the accelerated water leg. This reduces the hydrodynamic loads on the torus during the LOCA blowdown. The required differential pressure results in a downcomer waterleg of approximately 1 ft.

Initial drywell-to-suppression chamber differential pressure affects both the dynamic pool loads on the suppression chamber and the peak drywell pressure during downcomer pipe clearing during a Design Basis Accident LOCA. Drywell-to-suppression chamber differential pressure must be maintained within the specified limits so that the safety analysis remains valid.

Drywell-to-suppression chamber differential pressure satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

A drywell-to-suppression chamber differential pressure limit of 1.0 psid is required to ensure that the containment conditions assumed in the safety analyses are met. A

(continued)

BASES

LCO (continued)

drywell-to-suppression chamber differential pressure of < 1.0 psid corresponds to a downcomer water leg of approximately 1 ft. Failure to maintain the required differential pressure could result in excessive forces on the suppression chamber due to higher water clearing loads from downcomer vents and higher pressure buildup in the drywell.

A Note is provided to allow for periods of up to 4 hours when the LCO is not required to be met during the performance of required Surveillances that reduce the differential pressure. The 4 hour time is acceptable since the probability of a DBA LOCA occurring during this time is low.

APPLICABILITY

Drywell-to-suppression chamber differential pressure must be controlled when the primary containment is inert. The primary containment must be inert in MODE 1, since this is the condition with the highest probability for an event that could produce hydrogen. It is also the condition with the highest probability of an event that could impose large loads on the primary containment.

Inerting primary containment is an operational problem because it prevents primary containment access without an appropriate breathing apparatus. Therefore, the primary containment is inerted as late as possible in the unit startup and is de-inerted as soon as possible in the unit shutdown. As long as reactor power is < 15% RTP, the probability of an event that generates hydrogen or excessive loads on primary containment occurring within the first 24 hours following a startup or within the last 24 hours prior to a shutdown is low enough that these "windows," with the primary containment not inerted, are also justified. The 24 hour time period is a reasonable amount of time to allow plant personnel to perform inerting or de-inerting.

ACTIONS

A.1

If drywell-to-suppression chamber differential pressure is not within the limit, the conditions assumed in the safety analyses are not met and the differential pressure must be restored to within the limit within 24 hours. The 24 hour Completion Time provides sufficient time to restore

(continued)

BASES

ACTIONS

A.1 (continued)

differential pressure to within limit and takes into account the low probability of an event that would create excessive suppression chamber loads occurring during this time period.

B.1

If the differential pressure cannot be restored to within limits within the associated Completion Time, the plant must be placed in a MODE in which the LCO does not apply. This is done by reducing power to $\leq$ 15% RTP within 8 hours. The 8 hour Completion Time is reasonable, based on operating experience, to reduce reactor power from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.5.1

The drywell-to-suppression chamber differential pressure is regularly monitored to ensure that the required limits are satisfied. The 12 hour Frequency of this SR was developed based on operating experience relative to differential pressure variations and pressure instrument drift during applicable MODES and by assessing the proximity to the specified LCO differential pressure limit. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal pressure condition.

REFERENCES

None.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3.1 Primary Containment Oxygen Concentration

BASES

BACKGROUND

The primary containment is designed to withstand events that generate hydrogen either due to the zirconium metal water reaction in the core or due to radiolysis. The primary method to control hydrogen is to inert the primary containment. With the primary containment inerted, that is, oxygen concentration < 4.0 volume percent (v/o), a combustible mixture cannot be present in the primary containment for any hydrogen concentration. The capability to inert the primary containment and maintain oxygen < 4.0 v/o provides a method to mitigate events that produce hydrogen and oxygen. For example, an event that rapidly generates hydrogen from zirconium metal water reaction will result in excessive hydrogen in primary containment, but oxygen concentration will remain < 4.0 v/o and no combustion can occur. Long term generation of both hydrogen and oxygen from radiolytic decomposition of water may eventually result in a combustible mixture in primary containment. Radiolysis is the only significant reaction mechanism whereby oxygen, the limiting combustion reactant, is produced within the containment. The Technical Specification requirement to inert the primary containment and maintain oxygen < 4.0 v/o, in conjunction with the elimination of potential sources of air and oxygen (other than by radiolysis) from entering the primary containment provide assurance that the amount of oxygen that could be introduced into the containment will not cause the containment to become de-inerted within the first 30 days after an accident. This is consistent with the requirements of Generic Letter 84-09 (Ref. 1) for plants without recombiners. This LCO ensures that oxygen concentration does not exceed 4.0 v/o during operation in the applicable conditions.

APPLICABLE SAFETY ANALYSES

The Reference 2 calculations assume that the primary containment is inerted when a Design Basis Accident loss of coolant accident occurs. Thus, the hydrogen assumed to be released to the primary containment as a result of metal water reaction in the reactor core will not produce

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	combustible gas mixtures in the primary containment. Oxygen, which is subsequently generated by radiolytic decomposition of water, will not result in the primary containment becoming de-inerted within the first 30 days following an accident. Primary containment oxygen concentration satisfies 10 CFR 50.36(c)(2)(ii).
LCO	The primary containment oxygen concentration is maintained < 4.0 v/o to ensure that an event that produces any amount of hydrogen and oxygen does not result in a combustible mixture inside primary containment.
APPLICABILITY	The primary containment oxygen concentration must be within the specified limit when primary containment is inerted, except as allowed by the relaxations during startup and shutdown addressed below. The primary containment must be inert in MODE 1, since this is the condition with the highest probability of an event that could produce hydrogen and oxygen. Inerting the primary containment is an operational problem because it prevents containment access without an appropriate breathing apparatus. Therefore, the primary containment is inerted as late as possible in the plant startup and de-inerted as soon as possible in the plant shutdown. As long as reactor power is < 15% RTP, the potential for an event that generates significant hydrogen and oxygen is low and the primary containment need not be inert. Furthermore, the probability of an event that generates hydrogen occurring within the first 24 hours of a startup, or within the last 24 hours before a shutdown, is low enough that these "windows," when the primary containment is not inerted, are also justified. The 24 hour time period is a reasonable amount of time to allow plant personnel to perform inerting or de-inerting.
ACTIONS	<u>A.1</u> If oxygen concentration is ≥ 4.0 v/o at any time while operating in MODE 1, with the exception of the relaxations allowed during startup and shutdown, oxygen concentration

(continued)

BASES

ACTIONS

A.1 (continued)

must be restored to < 4.0 v/o within 24 hours. The 24 hour Completion Time is allowed when oxygen concentration is ≥ 4.0 v/o because of the availability of other hydrogen and oxygen mitigating systems (e.g., post-accident nitrogen purge) and the low probability and long duration of an event that would generate significant amounts of hydrogen and oxygen occurring during this period.

B.1

If oxygen concentration cannot be restored to within limits within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, power must be reduced to ≤ 15% RTP within 8 hours. The 8 hour Completion Time is reasonable, based on operating experience, to reduce reactor power from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1.1

The primary containment must be determined to be inerted by verifying that oxygen concentration is < 4.0 v/o. The 7 day Frequency is based on the slow rate at which oxygen concentration can change and on other indications of abnormal conditions (which could lead to more frequent checking by operators in accordance with plant procedures). Also, this Frequency has been shown to be acceptable through operating experience.

REFERENCES

1. Generic Letter 84-09, May 1984.

2. UFSAR, Section 6.2.5.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.1 Secondary Containment

BASES

BACKGROUND

The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment following a Design Basis Accident (DBA). In conjunction with operation of the Standby Gas Treatment (SGT) System and closure of certain valves whose lines penetrate the secondary containment, the secondary containment is designed to reduce the activity level of the fission products prior to release to the environment and to isolate and contain fission products that are released during certain operations that take place inside primary containment, when primary containment is not required to be OPERABLE, or that take place outside primary containment.

The secondary containment is a structure that completely encloses both primary containments and those components that may be postulated to contain primary system fluid, including the MSIV rooms. This structure forms a control volume that serves to hold up and dilute the fission products. It is possible for the pressure in the control volume to rise relative to the environmental pressure (e.g., due to pump and motor heat load additions). To prevent ground level exfiltration while allowing the secondary containment to be designed as a conventional structure, the secondary containment requires support systems to maintain the control volume pressure at less than the external pressure. Requirements for these systems are specified separately in LCO 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)," and LCO 3.6.4.3, "Standby Gas Treatment (SGT) System."

APPLICABLE SAFETY ANALYSES

There are two principal accidents for which credit is taken for secondary containment OPERABILITY. These are a loss of coolant accident (LOCA) (Ref. 1) and a fuel handling accident (Ref. 2). The secondary containment performs no active function in response to each of these limiting events; however, its leak tightness is required to ensure that the release of radioactive materials from the primary containment is restricted to those leakage paths and

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

associated leakage rates assumed in the accident analysis and that fission products entrapped within the secondary containment structure will be treated by the SGT System prior to discharge to the environment.

Secondary containment satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

An OPERABLE secondary containment provides a control volume into which fission products that bypass or leak from primary containment, or are released from the reactor coolant pressure boundary components located in secondary containment, can be diluted and processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained, the hatches and blowout panels must be closed and sealed, the sealing mechanisms (e.g., welds, bellows, or O-rings) associated with each secondary containment penetration must be OPERABLE (such that secondary containment leak tightness can be maintained), and all inner or all outer doors in each secondary containment access opening must be closed.

APPLICABILITY

In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5 to ensure a control volume, except for other situations for which significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel (OPDRVs), during CORE ALTERATIONS, or during movement of irradiated fuel assemblies in the secondary containment.

(continued)

BASES (continued)

ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

B.1 and B.2

If secondary containment cannot be restored to OPERABLE status within the required Completion Time, 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.

C.1, C.2, and C.3

Movement of irradiated fuel assemblies in the secondary containment, CORE ALTERATIONS, and OPDRVs can be postulated to cause fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. CORE ALTERATIONS and movement of irradiated fuel assemblies must be immediately suspended if the secondary containment is inoperable.

Suspension of these activities shall not preclude completing an action that involves moving a component to a safe position. Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

LCO 3.0.3 is not applicable while in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, Required Action C.1 has been modified by a

(continued)

ACTIONS

C.1, C.2, and C.3 (continued)

Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown, but would not require immediate suspension of movement of irradiated fuel assemblies. The Note to the ACTIONS, "LCO 3.0.3 is not applicable," ensures that the actions for immediate suspension of irradiated fuel assembly movement are not postponed due to entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1

This SR ensures that the secondary containment boundary is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to secondary containment vacuum variations during the applicable MODES and the low probability of a DBA occurring.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal secondary containment vacuum condition.

SR 3.6.4.1.2

Verifying that one secondary containment access door in each access opening is closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. Maintaining secondary containment OPERABILITY requires verifying one door in the access opening is closed. An access opening contains one inner and one outer door. In some cases a secondary containment barrier contains multiple inner or multiple outer doors. For these cases, the access opening share the inner door or the outer door, i.e., the access openings have a common inner or outer door. The intent is to not breach the

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SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.2 (continued)

secondary containment at any time when secondary containment is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times; i.e., all inner doors closed or all outer doors closed. Thus each access opening has one door closed. However, all secondary containment access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. The 31 day Frequency for these SRs has been shown to be adequate, based on operating experience, and is considered adequate in view of the other indications of door status that are available to the operator.

SR 3.6.4.1.3

The SGT System exhausts the secondary containment atmosphere to the environment through appropriate treatment equipment. Each SGT subsystem is designed to maintain the secondary containment at $\geq$ 0.25 inches of vacuum water gauge for 1 hour at a flow rate of $\leq$ 4000 cfm. To ensure that all fission products released to the secondary containment are treated, SR 3.6.4.1.3 verifies that a pressure in the secondary containment that is less than the lowest postulated pressure external to the secondary containment boundary can be maintained. When the SGT System is operating as designed, the maintenance of secondary containment pressure cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.3 demonstrates that the pressure in the secondary containment can be maintained $\geq$ 0.25 inches of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate $\leq$ 4000 cfm. The 1 hour test period allows secondary containment to be in thermal equilibrium at steady state conditions. The primary purpose of the SR is to ensure secondary containment boundary integrity. The secondary purpose of the SR is to ensure that the SGT subsystem being tested functions as designed. There is a separate LCO with Surveillance Requirements that serves the primary purpose of ensuring OPERABILITY of the SGT System. This SR need not be performed with each SGT subsystem. The SGT subsystem used for this Surveillance is staggered to ensure that in

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BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.4.1.3 (continued) addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. The inoperability of the SGT System does not necessarily constitute a failure of this Surveillance relative to secondary containment OPERABILITY. Operating experience has shown the secondary containment boundary usually passes this Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.
REFERENCES	1. UFSAR, Section 15.6.5. 2. UFSAR, Section 15.7.2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.2 Secondary Containment Isolation Valves (SCIVs)

BASES

BACKGROUND

The function of the SCIVs, 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). Secondary containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that fission products that leak from primary containment following a DBA, or that are released during certain operations when primary containment is not required to be OPERABLE or take place outside primary containment, are maintained within the secondary containment boundary.

The OPERABILITY requirements for SCIVs help ensure that an adequate secondary containment boundary is maintained during and after an accident by minimizing potential paths to the environment. These isolation devices consist of either passive devices or active (automatic) devices. Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), and blind flanges are considered passive devices.

Automatic SCIVs (i.e., dampers) close on a secondary containment isolation signal to establish a boundary for untreated radioactive material within secondary containment following a DBA or other accidents.

Other penetrations required to be closed during accident conditions are isolated by the use of valves in the closed position or blind flanges.

APPLICABLE SAFETY ANALYSES

The SCIVs must be OPERABLE to ensure the secondary containment barrier to fission product releases is established. The principal accidents for which the secondary containment boundary is required are a loss of coolant accident (Ref. 1) and a fuel handling accident (Ref. 2). The secondary containment performs no active function in response to either of these limiting events, but the boundary established by SCIVs is required to ensure that

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APPLICABLE SAFETY ANALYSES (continued)

leakage from the primary containment is processed by the Standby Gas Treatment (SGT) System before being released to the environment.

Maintaining SCIVs OPERABLE with isolation times within limits ensures that fission products will remain trapped inside secondary containment so that they can be treated by the SGT System prior to discharge to the environment.

SCIVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

SCIVs form a part of the secondary containment boundary. The SCIV safety function is related to control of offsite radiation releases resulting from DBAs.

The power operated, automatic, isolation valves are considered OPERABLE when their isolation times are within limits and the valves actuate on an automatic isolation signal. The valves covered by this LCO, along with their associated stroke times, are listed in the Technical Requirements Manual (Ref. 3).

The normally closed manual SCIVs are considered OPERABLE when the valves are closed and blind flanges are in place, or open under administrative controls. These passive isolation valves or devices are listed in Reference 3.

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to the primary containment that leaks to the secondary containment. Therefore, the OPERABILITY of SCIVs is required.

In MODES 4 and 5, the probability and consequences of these events are reduced due to pressure and temperature limitations in these MODES. Therefore, maintaining SCIVs OPERABLE is not required in MODE 4 or 5, except for other situations under which significant radioactive releases can be postulated, such as during operations with a potential for draining the reactor vessel (OPDRVs), during CORE ALTERATIONS, or during movement of irradiated fuel assemblies in the secondary containment.

(continued)

BASES (continued)

ACTIONS

The ACTIONS are modified by three Notes. The first Note allows penetration flow paths to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment isolation is indicated.

The second Note provides clarification, that for the purpose of this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable SCIV. Complying with the Required Actions may allow for continued operation, and subsequent inoperable SCIVs are governed by subsequent Condition entry and application of associated Required Actions.

The third Note ensures appropriate remedial actions are taken, if necessary, if the affected system(s) are rendered inoperable by an inoperable SCIV.

A.1 and A.2

In the event that there are one or more penetration flow paths with one SCIV inoperable, the affected penetration flow path(s) must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic SCIV, a closed manual valve, and a blind flange. For penetrations isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available device to secondary containment. The Required Action must be completed within the 8 hour Completion Time. The specified time period is reasonable considering the time required to isolate the penetration, and the probability of a DBA, which requires the SCIVs to close, occurring during this short time is very low.

For affected penetrations that have been isolated in accordance with Required Action A.1, the affected penetration must be verified to be isolated on a periodic

(continued)

ACTIONS

A.1 and A.2 (continued)

basis. This is necessary to ensure that secondary containment penetrations required to be isolated following an accident, but no longer capable of being automatically isolated, will be in the isolation position should an event occur. The Completion Time of once per 31 days is appropriate because the isolation devices are operated under administrative controls and the probability of their misalignment is low. This Required Action does not require any testing or device manipulation. Rather, it involves verification that the affected penetration remains isolated.

Required Action A.2 is modified by two Notes. Note 1 applies to isolation devices located in high radiation areas and allows them to be verified closed by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted. Note 2 applies to isolation devices that are locked, sealed, or otherwise secured in position and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the function of locking, sealing, or securing components is to ensure that these devices are not inadvertently respositioned. Therefore, the probability of misalignment, once they have been verified to be in the proper position, is low.

B.1

With two SCIVs in one or more penetration flow paths inoperable, the affected penetration flow path must be isolated within 4 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic valve, a closed manual valve, and a blind flange. The 4 hour Completion Time is reasonable considering the time required to isolate the penetration and the probability of a DBA, which requires the SCIVs to close, occurring during this short time, is very low.

(continued)

BASES

ACTIONS

B.1 (continued)

The Condition has been modified by a Note stating that Condition B is only applicable to penetration flow paths with two isolation valves. This clarifies that only Condition A is entered if one SCIV is inoperable in each of two penetrations.

C.1 and C.2

If any Required Action and associated Completion Time cannot be 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 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.

D.1, D.2, and D.3

If any Required Action and associated Completion Time are not met, the plant must be placed in a condition in which the LCO does not apply. If applicable, CORE ALTERATIONS and the movement of irradiated fuel assemblies in the secondary containment must be immediately suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be immediately initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, Required Action D.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving fuel while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown, but would not require immediate suspension of movement of irradiated fuel assemblies.

(continued)

ACTIONS

D.1, D.2, and D.3 (continued)

The Note to the ACTIONS, "LCO 3.0.3 is not applicable," ensures that the actions for immediate suspension of irradiated fuel assembly movement are not postponed due to entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1

This SR verifies that each secondary containment manual isolation valve and blind flange that is not locked, sealed, or otherwise secured and is required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside of the secondary containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification that those SCIVs in secondary containment that are capable of being mispositioned are in the correct position.

Since these SCIVs are readily accessible to personnel during normal operation and verification of their position is relatively easy, the 31 day Frequency was chosen to provide added assurance that the SCIVs are in the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the closed position, since these were verified to be in the correct position upon locking, sealing, or securing.

Two Notes have been added to this SR. The first Note applies to valves and blind flanges located in high radiation areas and allows them to be verified by use of administrative controls. Allowing verification by administrative controls is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment of these SCIVs, once they have been verified to be in the proper position, is low.

A second Note has been included to clarify that SCIVs that are open under administrative controls are not required to meet the SR during the time the SCIVs are open. These controls consist of stationing a dedicated operator at the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.2.1 (continued)

controls of the valve, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for secondary containment isolation is indicated.

SR 3.6.4.2.2

Verifying that the isolation time of each power operated, automatic SCIV is within limits is required to demonstrate OPERABILITY. The isolation time test ensures that the SCIV will isolate in a time period less than or equal to that assumed in the safety analyses. The Frequency of this SR is 92 days.

SR 3.6.4.2.3

Verifying that each automatic SCIV closes on a secondary containment isolation signal is required to prevent leakage of radioactive material from secondary containment following a DBA or other accidents. This SR ensures that each automatic SCIV will actuate to the isolation position on a secondary containment isolation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. While this Surveillance can be performed with the reactor at power, operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Section 15.6.5.
2. UFSAR, Section 15.7.2.
3. Technical Requirements Manual.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.3 Standby Gas Treatment (SGT) System

BASES

BACKGROUND

The SGT System is required by UFSAR, Section 3.1.9.1 (Ref. 1). The function of the SGT System is to ensure that radioactive materials that leak from the primary containment into the secondary containment following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

The SGT System consists of two fully redundant subsystems that are shared between Unit 1 and Unit 2, each with its own set of ductwork, dampers, charcoal filter train, and controls.

Each charcoal filter train consists of (components listed in order of the direction of the air flow):

a. A demister;

b. An electric heater;

c. A rough prefilter;

d. A high efficiency particulate air (HEPA) filter;

e. A charcoal adsorber;

f. A second HEPA afterfilter; and

g. A centrifugal fan.

The sizing of the SGT System equipment and components is based on the results of an infiltration analysis, as well as an exfiltration analysis of the secondary containment. Each SGT subsystem is capable of processing the secondary containment volume, which includes both Unit 1 and Unit 2. The internal pressure of the secondary containment is maintained at a negative pressure of $\geq$ 0.25 inches water gauge when the SGT System is in operation, which represents the internal pressure required to ensure zero exfiltration of air from the building when exposed to a 35 mph wind.

(continued)

BASES

BACKGROUND (continued)

The demister is provided to remove entrained water in the air, while the electric heater reduces the relative humidity of the airstream to less than 70% (Ref. 2). The prefilter removes large particulate matter, while the HEPA filter removes fine particulate matter and protects the charcoal from fouling. The charcoal adsorber removes gaseous elemental iodine and organic iodides, and the final HEPA filter collects any carbon fines exhausted from the charcoal adsorber.

The SGT System automatically starts and operates in response to actuation signals indicative of conditions or an accident that could require operation of the system. Following initiation, the pre-selected subsystem train inlet and outlet dampers will automatically open, the associated train's cooling air damper closes, and the associated fan starts and operates at a flow rate of 4000 cfm ± 10%. The Reactor Building suction damper for the subsystem on the unaffected reactor unit closes and the subsystem's associated cooling air damper remains open to provide decay heat removal. After secondary containment isolation, the SGT subsystem, under calm wind conditions, holds the building at an average negative pressure of 0.25 inches water gauge. A failure of the primary SGT subsystem to start within 25 seconds will initiate the automatic start and alignment of the standby SGT subsystem.

APPLICABLE SAFETY ANALYSES

The design basis for the SGT System is to mitigate the consequences of a loss of coolant accident and fuel handling accidents (Refs. 2, 3, 4 and 5). For all events analyzed, the SGT System is shown to be automatically initiated to reduce, via filtration and adsorption, the radioactive material released to the environment.

The SGT System satisfies 10 CFR 50.36(c)(2)(ii).

LCO

Following a DBA, a minimum of one SGT subsystem is required to maintain the secondary containment at a negative pressure with respect to the environment and to process gaseous releases. Meeting the LCO requirements for two OPERABLE subsystems ensures operation of at least one SGT subsystem in the event of a single active failure. OPERABILITY of a subsystem also requires the associated cooling air damper remain OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, SGT System OPERABILITY is required during these MODES.

In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the SGT System in OPERABLE status is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel (OPDRVs), during CORE ALTERATIONS, or during movement of irradiated fuel assemblies in the secondary containment.

ACTIONS

A.1

With one SGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status in 7 days. In this condition, the remaining OPERABLE SGT subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SGT System and the low probability of a DBA occurring during this period.

B.1 and B.2

If the SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, 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.

(continued)

ACTIONS (continued)

C.1, C.2.1, C.2.2, and C.2.3

During movement of irradiated fuel assemblies, in the secondary containment, during CORE ALTERATIONS, or during OPDRVs, when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SGT subsystem should immediately be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that could prevent automatic actuation will occur, and that any other failure would be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that represent a potential for releasing radioactive material to the secondary containment, thus placing the plant in a condition that minimizes risk. If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies must immediately be suspended. Suspension of these activities must not preclude completion of movement of a component to a safe position. Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

LCO 3.0.3 is not applicable in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, the Required Actions of Condition C have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown, but would not require immediate suspension of movement of irradiated fuel assemblies. The Note to the ACTIONS, "LCO 3.0.3 is not applicable," ensures that the actions for immediate suspension of irradiated fuel assembly movement are not postponed due to entry into LCO 3.0.3.

D.1

If both SGTS subsystems are inoperable in MODE 1, 2, or 3, the SGT system may not be capable of supporting the required radioactivity release control function. Therefore, one SGT subsystem must be restored to OPERABLE status within 1 hour.

(continued)

BASES

ACTIONS

D.1 (continued)

The 1 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of supporting the required radioactivity release control function in MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring the SGT System) occurring during periods where the required radioactivity release control function may not be maintained is minimal.

E.1 and E.2

If one SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, 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.

F.1, F.2, and F.3

When two SGT subsystems are inoperable, if applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in secondary containment must immediately be suspended. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, action must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

LCO 3.0.3 is not applicable while in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, Required Action F.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown,

(continued)

BASES

ACTIONS

F.1, F.2, and F.3 (continued)

but would not require immediate suspension of movement of irradiated fuel assemblies. The Note to the ACTIONS, "LCO 3.0.3 is not applicable," ensures that the actions for immediate suspension of irradiated fuel assembly movement are not postponed due to entry into LCO 3.0.3.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating (from the control room using the manual initiation switch) each SGT subsystem for $\geq$ 10 continuous hours ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation with the heaters on (automatic heater cycling to maintain temperature) for $\geq$ 10 continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The SGT System filter tests are in accordance with Regulatory Guide 1.52 (Ref. 6). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.4.3.3

This SR verifies that each SGT subsystem starts on receipt of an actual or simulated initiation signal. While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the 24 month

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.4.3.3 (continued) Frequency. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.2, "Secondary Containment Isolation Instrumentation," overlaps this SR to provide complete testing of the safety function. Therefore, the Frequency was found to be acceptable from a reliability standpoint.
REFERENCES	1. UFSAR, Section 3.1.9.1. 2. UFSAR, Section 6.5.1.1. 3. UFSAR, Section 15.6.2. 4. UFSAR, Section 15.6.5. 5. UFSAR, Section 15.7.2. 6. Regulatory Guide 1.52, Rev. 2.

3.7 - LIMITING CONDITIONS FOR OPERATION

A. PRIMARY CONTAINMENT INTEGRITY

A.2

LCO 3.6.1.1 PRIMARY CONTAINMENT INTEGRITY shall be ~~maintained~~ OPERABLE

APPLICABILITY:

A.3

OPERATIONAL MODE(s) 1, 2[a] and 3.

ACTION: OPERABLE A.2

ACTION A Without PRIMARY CONTAINMENT INTEGRITY, restore PRIMARY CONTAINMENT INTEGRITY within 1 hour

ACTION B or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

A.4
moved to
ITS 3.6.1.3

4.7 - SURVEILLANCE REQUIREMENTS

A. PRIMARY CONTAINMENT INTEGRITY

PRIMARY CONTAINMENT INTEGRITY shall be demonstrated:

1. SR 3.6.1.1.1 Perform required visual examinations and leakage rate testing except for primary containment air lock testing in accordance with and at the frequency specified by the Primary Containment Leakage Rate Testing Program.

2. At least once per 31 days by verifying that all primary containment penetrations[b] not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed, except for valves that are open under administrative control as permitted by Specification 3.7.D.

3. ~~By verifying each primary containment air lock is in compliance with the requirements of Specification 3.7.C.~~

4. ~~By verifying the suppression chamber is in compliance with the requirements of Specification 3.7.K.~~

A.5

A.3

A.4
moved to
ITS 3.6.1.3

a ~~See Special Test Exception 3.12.A.~~

b Except valves, blind flanges, and deactivated automatic valves which are located inside the containment. Valves and blind flanges in high radiation areas may be verified by use of administrative controls. These penetrations shall be verified closed during each COLD SHUTDOWN except such verification need not be performed when the primary containment has not been de-inerted since the last verification or more often than once per 92 days.

3.7 - LIMITING CONDITIONS FOR OPERATION

K. Suppression Chamber

The suppression chamber shall be OPERABLE with:

1. The suppression pool water level between 14' 1" and 14' 5",

2. A suppression pool maximum average water temperature of ≤95°F during OPERATIONAL MODE(s) 1 or 2, except that the maximum average temperature may be permitted to increase to:

   a. ≤105°F during testing which adds heat to the suppression pool.

   b. ≤110°F with THERMAL POWER ≤1% of RATED THERMAL POWER.

   c. ≤120°F with the main steam line isolation valves closed following a scram.

SR 3.6.1.1.2

3. A total leakage between the suppression chamber and drywell of less than the equivalent leakage through a 1 inch diameter orifice at a differential pressure of 1.0 psid. A.6 L.3

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

1. With the suppression pool water level outside the above limits, restore the water level to within the limits

add proposed ACTION A L.1

4.7 - SURVEILLANCE REQUIREMENTS

K. Suppression Chamber

The suppression chamber shall be demonstrated OPERABLE:

1. By verifying the suppression pool water level to be within the limits at least once per 24 hours.

2. At least once per 24 hours by verifying the suppression pool average water temperature to be ≤95°F, except:

   a. At least once per 5 minutes during testing which adds heat to the suppression pool, by verifying the suppression pool average water temperature to be ≤105°F.

   b. At least once per hour when suppression pool average water temperature is ≥95°F, by verifying:

      1) Suppression pool average water temperature to be ≤110°F, and

      2) THERMAL POWER to be ≤1% of RATED THERMAL POWER after suppression pool average water temperature has exceeded 95°F for more than 24 hours.

   c. At least once per 30 minutes with the main steam line isolation valves closed following a scram and suppression pool average water temperature >95°F, by verifying suppression pool average water temperature to be ≤120°F.

<see ITS 3.6.2.1 and ITS 3.6.2.2>

3.7 - LIMITING CONDITIONS FOR OPERATION

within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. In OPERATIONAL MODE(s) 1 or 2 with the suppression pool average water temperature >95°F, except as permitted above, restore the average temperature to ≤95°F within 24 hours or reduce THERMAL POWER to ≤1% RATED THERMAL POWER within the next 12 hours.

3. With the suppression pool average water temperature >105°F during testing which adds heat to the suppression pool, except as permitted above, stop all testing which adds heat to the suppression pool and restore the average temperature to ≤95°F within 24 hours or reduce THERMAL POWER to ≤1% RATED THERMAL POWER within the next 12 hours.

4. With the suppression pool average water temperature >110°F, immediately place the reactor mode switch in the Shutdown position and operate at least one residual heat removal loop in the suppression pool cooling mode.

5. With the suppression pool average water temperature >120°F, depressurize the reactor pressure vessel to <150 psig (reactor steam dome pressure) within 12 hours.

<see ITS 3.6.2.1 and 3.6.2.2>

4.7 - SURVEILLANCE REQUIREMENTS

~~3. Deleted.~~

~~4. Deleted~~

LD.1

SR 3.6.1.1.2 5. At least once per ~~18~~ 24 months ~~by conducting a drywell to suppression chamber bypass leak test at an initial differential pressure of 1.0 psid and~~ verifying that the measured leakage is within the specified limit. ~~If any drywell to suppression chamber bypass leak test fails to meet the specified limit, the test schedule for subsequent tests shall be reviewed and approved by the Commission.~~ ~~If two consecutive tests fail to meet the specified limit, a test shall be performed at least every 9 months until two consecutive tests meet the specified limit, at which time the 18 month test schedule may be resumed.~~

L.3

L.2

L.4

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The definition of PRIMARY CONTAINMENT INTEGRITY in CTS 3/4.7.A and the associated Action have not been included in the ITS. It is replaced with the requirement for primary containment to be OPERABLE. This was done because of the confusion associated with the definition compared to its use in the respective LCO. The change is editorial in that all the requirements are specifically addressed in ITS 3.6.1.1 for the primary containment along with the remainder of the LCOs in the Primary Containment Section (i.e., air locks, isolation valves, suppression pool, etc.). Therefore, the change is a presentation preference adopted by the BWR ISTS, NUREG-1433, Rev. 1.

A.3 CTS 3.7.A Applicability footnote a, which provides a cross reference to CTS 3.12.A, has been deleted. The format of the proposed Technical Specifications does not include providing cross references. Proposed LCO 3.0.7 adequately prescribes the use of the Special Operations LCOs without such references. Therefore the existing reference in the CTS 3.7.A Applicability footnote a to the Special Test Exception of CTS 3.12.A serves no functional purpose, and its removal is an administrative change.

A.4 CTS 4.7.A.2 (including footnote b), relating to the position verification of PCIVs, has been moved to ITS 3.6.1.3 in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to these requirements will be discussed in the Discussion of Changes for ITS: 3.6.1.3.

A.5 The requirements for the air lock (CTS 4.7.A.3) and the suppression chamber (CTS 4.7.A.4) remain within the ITS. Providing a cross reference to them only adds confusion when evaluating compliance with Primary Containment OPERABILITY. Therefore, removal of these Surveillances which reference other Specifications is administrative.

A.6 The drywell-to-suppression chamber bypass leakage requirement of CTS 3.7.K.3 is proposed to be a supporting Surveillance for Primary Containment OPERABILITY (proposed SR 3.6.1.1.2); bypass leakage within limit is essential for the primary containment to perform its pressure suppression function and to ensure the primary containment design pressure is not exceeded. Therefore, the

ADMINISTRATIVE

A.6 (cont'd) actual LCO statement is not needed since it is part of Primary Containment OPERABILITY (ITS 3.6.1.1). This change is considered a presentation preference, which is administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LD.1 The Frequency for performing CTS 4.7.K.5 (proposed SR 3.6.1.1.2), the drywell to suppression chamber bypass leak test, has been extended from 18 months to 24 months to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow the normal Surveillance to extend the Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991. This SR ensures that the boundary between the drywell airspace and the suppression chamber airspace is maintained to ensure the pressure suppression function is OPERABLE by limiting the amount of bypass steam leakage which would not be directed through the suppression pool water. The suppression chamber-to-drywell vacuum breakers are the only active mechanical devices in the boundary between the drywell air space and the suppression chamber and are functionally tested on a more frequent basis by ITS SR 3.6.1.8.2 to ensure their OPERABILITY. In addition, ITS SR 3.6.1.8.1 verifies the suppression chamber-to-drywell vacuum breakers are closed every 14 days. Although the more frequent tests do not directly ensure the leak tightness of the drywell to suppression chamber boundary, they do ensure the valves are functional and closed. Based on the passive design of the suppression chamber-to-drywell vacuum breakers and the more frequent functional testing of the suppression chamber-to-drywell vacuum breakers, the impact, if any, from this change on component and system availability is minimal.

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) Reviews of historical maintenance and surveillance data have shown that these tests normally pass their Surveillances at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequency, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) does not invalidate any assumptions in the plant licensing basis. The proposed Frequency is acceptable since it satisfies the intent of the accelerated Frequency requirement. Furthermore, it is expected that this requirement will be rarely used.

"Specific"

L.1 In the ITS presentation (refer to Discussion of Change A.2 above), primary containment structural integrity or leakage rates discovered outside acceptance criteria (ITS SR 3.6.1.1.1) or the drywell-to-suppression chamber bypass leakage outside limits (ITS SR 3.6.1.1.2) will result in declaring the Primary Containment inoperable. ITS 3.6.1.1 ACTIONS for these conditions require commencing a shutdown to MODES 3 and 4 if the leakage or structural integrity problem is not corrected within 1 hour. With drywell-to-suppression chamber bypass leakage outside of limits in MODE 1, 2, or 3, CTS 3.7.K does not provide actions. Since drywell-to-suppression chamber leakage is an attribute of maintaining Primary Containment Integrity (in ITS terminology, primary containment OPERABILITY), a 1 hour allowed outage time is provided for this condition consistent with the current Actions allowed for structural integrity and primary containment leakage not within limits in CTS 3.7.A. This change will provide consistency in ITS ACTIONS for the various primary containment degradations. With primary containment OPERABILITY lost, the risk associated with continued operation for a short period of time could be less than that associated with an immediate plant shutdown. This change is acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which continued operation is allowed and primary containment is inoperable.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.2 The requirement in CTS 4.7.K.5 for the NRC to review the test schedule for subsequent tests if any leak rate test result is not within the required limits has been deleted since the NRC has already approved the test schedule. If one test fails, the current Technical Specifications do not require the test frequency to be changed. The test frequency is only required to be changed if two consecutive tests have failed, as stated in CTS 4.7.K.5. Since the test schedule is already covered by the Technical Specifications, which has been approved by the NRC, there is no reason to have a requirement that the NRC review the test schedule (which will not change from the current test schedule) when one test fails. In addition, a historical review has shown this Surveillance has never failed. Therefore, this change is considered to be acceptable.

L.3 CTS 3.7.K.3 requires the total leakage between the suppression chamber and drywell of less than the equivalent leakage through a 1 inch diameter orifice at a differential pressure of 1.0 psid. In addition, CTS 4.7.K.5 requires this test to be performed every 18 months (extended to 24 months in accordance with Discussion of Change LD.1). ITS SR 3.6.1.1.2 requires the drywell-to-suppression chamber bypass leakage to be less than or equal to the bypass leakage limit. The bypass leakage limit is specified in the Bases to be less than or equal to the acceptable $A/\sqrt{k}$ design value of 0.18 ft^2 assumed in the safety analysis. However, ITS SR 3.6.1.1.2 further requires the drywell-to-suppression chamber bypass leakage to be $\leq$ 2% of the drywell-to-suppression chamber bypass leakage limit during the first unit startup following bypass leakage testing performed in accordance with proposed SR 3.6.1.1.2. The current bypass leakage limit (equivalent leakage through a 1 inch diameter orifice) is equivalent to the proposed bypass leakage required during testing ($\leq$ 2% of the drywell-to-suppression chamber bypass leakage limit) as documented in Quad Cities Special Report No. 4 submitted to A. Giambusso (NRC) from L. D. Butterfield (Commonwealth Edison) on October 23, 1972. The wording of proposed ITS SR 3.6.1.1.2 is modeled after those provided in the drywell bypass leakage limit Surveillance Requirement of NUREG-1434, SR 3.6.5.1.1. Proposed SR 3.6.1.1.2 is consistent with the current drywell-to-suppression chamber leakage rate limit testing requirements described in the CTS 3.7.K.3, with two exceptions. Proposed SR 3.6.1.1.2 will continue to require that drywell-to-suppression chamber bypass leakage be less than or equal to 2% of the acceptable limit (equivalent leakage through a 1 inch diameter orifice) during the first unit startup following bypass leakage testing performed in accordance with ITS 3.6.1.1, however, bypass leakage will be considered to be acceptable if it is less than or equal to the design $A/\sqrt{k}$ leakage limit at all other times between required tests.

TECHNICAL CHANGES - LESS RESTRICTIVE

L.3 (cont'd) This change to CTS 3.7.K.3 is considered acceptable based upon a history of satisfactory results from prior drywell-to-suppression chamber bypass leakage rate testing. The second exception is that the detail of the initial differential pressure to perform the test has been deleted from the Technical Specifications. These details for testing are not necessary in the Technical Specifications since the proposed limits will ensure that the leakage limits will be met during plant operations.

L.4 CTS 4.7.K.5 requires the drywell-to-suppression chamber bypass leakage test to be performed at an accelerated frequency if two consecutive tests fail to meet the specified limit. This accelerated testing requirement has been deleted. Under the proposed change, drywell-to-suppression chamber will continue to be verified on the frequency specified in CTS 4.7.K.5 except as modified in accordance with LD.1. This change to CTS 4.7.K.5 is considered to be acceptable based upon a history of satisfactory results from prior drywell-to-suppression chamber bypass leakage rate testing. Additionally, existing provisions under the maintenance rule would invoke remedial actions, such as increased test frequency, in the event of an adverse trend in bypass leakage rates.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

C. Primary Containment Air Locks

LCO 3.6.1.2 Each primary containment air lock shall be OPERABLE.

APPLICABILITY: A.2 L.1

OPERATIONAL MODE(s) 1, 2[a] and 3.

add proposed ACTIONS Note 1

ACTION: add proposed ACTIONS Note 2 A.3

1. With one primary containment air lock door inoperable: L.2 within 1 hour

   ACTION A

   a. Verify ~~Maintain~~ at least the OPERABLE air lock door closed[b] and either restore the inoperable air lock door to OPERABLE status within 24 hours ~~or~~ lock the OPERABLE air lock door closed. add proposed Note 1 to Required Action A A.4 A.5

   ACTION A

   b. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed[b] at least once per 31 days. A.6 L.3 add proposed Note to Required Action A.3

4.7 - SURVEILLANCE REQUIREMENTS

C. Primary Containment Air Locks

Each primary containment air lock shall be demonstrated OPERABLE:

SR 3.6.1.2.1 1. By performing required primary containment air lock leakage testing in accordance with and at the frequency specified by the Primary Containment Leakage Rate Testing Program[c][d].

SR 3.6.1.2.2 2. At least once per ~~6~~ 24 months, by verifying that only one door in each air lock can be opened at a time[e]. L.5

ACTIONS NOTE 1

a See Special Test Exception 3.12.A. A.2

Required Action A Note 2 b ~~Except during entry through an OPERABLE door to repair an inoperable door~~ or to facilitate the removal of personnel for a cumulative time not to exceed one hour per year. L.1 for all types of inoperabilities L.4

Note 1 to SR 3.6.1.2.1 c An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test.

Note 2 to SR 3.6.1.2.1 d Results shall be evaluated against acceptance criteria applicable to Specification 4.7.A.1.

e ~~Only required to be performed upon entry into primary containment air lock when the primary containment is de-inerted.~~ L.5

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3.7 - LIMITING CONDITIONS FOR OPERATION **4.7 - SURVEILLANCE REQUIREMENTS**

ACTION D

c. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION B

add proposed Note 1 to Required Action B A.4

2. With the primary containment air lock interlock mechanism inoperable, ~~restore the air lock interlock mechanism to OPERABLE status within 24 hours, or~~ lock at least one air lock door closed and verify that the door is locked closed at least once per 31 days. Personnel entry and exit through the airlock is permitted ~~provided one OPERABLE air lock door remains locked closed at all times~~ and an individual is dedicated ~~to assure that both air lock doors are not opened simultaneously.~~

A.5 add proposed Required Action B.1 M.1 L.3

add proposed Note to Required Action B.3

L.6

LA.1

add proposed ACTION D A.7

ACTION C

3. With the primary containment air lock inoperable, except as a result of an inoperable air lock door or interlock mechanism, ~~maintain~~ Verify at least one air lock door closed within 1 hour; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION D

add proposed Required Action C.1 A.3

L.2

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 3.7.C Applicability footnote a, which provides a cross reference to CTS 3.12.A, has been deleted. The format of the proposed Technical Specifications does not include providing cross references. Proposed LCO 3.0.7 adequately prescribes the use of the Special Operations LCOs without such references. Therefore, the existing reference in the CTS 3.7.C Applicability footnote a to the Special Test Exception of CTS 3.12.A serves no purpose, and its removal is an administrative change.

A.3 A Note (ACTIONS Note 2) has been added to the CTS 3.7.C ACTIONS which clarifies that entry into the applicable Conditions and Required Actions of LCO 3.6.1.1, "Primary Containment," is required when air lock leakage results are exceeding overall containment leakage acceptance criteria. This Note facilitates an understanding of the intent of LCO 3.6.1.2 and is consistent with the existing requirements in CTS 4.7.C.1 footnote d.

In addition, Required Action C.1 has been added to CTS 3.7.C Action 3 to help ensure that the primary containment overall leakage is evaluated, against the acceptance criteria, if an air lock is inoperable.

These clarifications are consistent with the intent and interpretation of the existing Technical Specifications, and are therefore considered administrative presentation preferences.

A.4 Notes to ITS 3.6.1.2 Required Actions A and B (Note 1: "Required Actions...are not applicable if...Condition C is entered") are added to provide more explicit instructions for proper application of the ACTIONS for Technical Specification compliance. In conjunction with the proposed Specification 1.3, "Completion Times," these ACTIONS provide direction consistent with the intent of CTS 3.7.C Actions 1 and 2 for one inoperable air lock door in the air lock. In ITS 3.6.1.2 Required Actions A and B Notes, there is a recognition that if both doors are inoperable (Condition C entered), then an "OPERABLE" door

ADMINISTRATIVE

A.4 (cont'd) does not exist to be closed (ITS 3.6.1.2 Required Actions A.1, A.2, A.3, B.1, B.2, and B.3 cannot be met). Since this change only provides clearer direction and is consistent with the interpretation of the CTS, the change is considered administrative.

A.5 The revised presentation of CTS 3.7.C Action 1.a and Action 2 (based on the BWR ISTS, NUREG-1433, Rev. 1) do not explicitly detail options to "restore...to OPERABLE status." This action is always an option, and is implied in all Actions. Omitting this action from the ITS is editorial.

A.6 The requirement for performing the overall air lock leakage test is a requirement of 10 CFR 50 Appendix J (as described in the Primary Containment Leakage Rate Testing Program in Section 5.5 of the ITS). This requirement is embodied in proposed SR 3.6.1.2.1. It is possible that the test would not be able to be performed with an inoperable air lock door, and a plant shutdown would be required due to the inability to perform the required Surveillance. However, this restriction on continued operation need not be specified (as is the case in CTS 3.7.C Action 1.b) since it exists inherently as a result of the required Appendix J testing. Therefore, no change in operation requirements or intent is made, and the proposed revision to eliminate a specific restriction on continued operation is considered an administrative presentation preference.

A.7 CTS 3.7.C Action 2 (for an inoperable primary containment air lock interlock mechanism) does not include a default Action consistent with other Actions in CTS 3.7.C (be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours). However, these Actions would be taken if the Required Actions were not met since the inoperability in this Action is no worse than the other inoperabilities of CTS 3.7.C (one inoperable door, or two inoperable doors). Therefore, ITS 3.6.1.2 ACTION D is proposed to be added as the default action for CTS 3.7.C Action 2 (ITS 3.6.1.2 ACTION B). Since this change only provides more explicit direction of the current interpretation of the existing Specification, this change is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 A new Required Action has been added to CTS 3.7.C Action 2 (primary containment air lock interlock mechanism inoperable) to verify an OPERABLE door is closed in the air lock within 1 hour. The 1 hour is allowed to complete the verification in ITS 3.6.1.2 Required Action B.1 since the level of degradation associated with the CTS Actions is no worse than that allowed for

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 (cont'd) Primary Containment Integrity (CTS 3.7.A) not maintained. CTS 3.7.A (ITS 3.6.1.1) allows the primary containment to be inoperable for 1 hour. Also, the primary containment air lock doors are normally closed except for entry and exit. Therefore, the probability that the OPERABLE air lock door is open is low during the 1 hour period. This requirement is consistent with current Actions in CTS 3.7.C to maintain the air lock closed for other air lock inoperabilities (CTS 3.7.C Actions 1 and 3). This added requirement will help ensure primary containment integrity is maintained.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The purpose as to why a portion of CTS 3.7.C Action 2, which prescribes the necessary administrative controls during entry and exit of personnel through an air lock with an inoperable air lock interlock mechanism (i.e., "to assure that both air lock doors are not opened simultaneously"), is proposed to be relocated to the Bases. The proposed requirement in ITS 3.6.1.2 Required Action B Note 2 will require entry into and exit from primary containment under the control of a dedicated individual. This is sufficient to ensure the appropriate administrative controls are enforced. In addition, the Bases prescribes that entry into and exit from the primary containment is under the control of a dedicated individual stationed to ensure that only one door is opened at a time. As a result, this detail is not necessary to be included in the Technical Specifications to ensure the administrative controls are applied. As such, the relocated detail is not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

"Specific"

L.1 ITS 3.6.1.2 ACTIONS Note 1 is added to the Technical Specifications to allow entry through a closed or locked air lock door for the purpose of making repairs to air lock components. If the outer door is inoperable, then it may be easily accessed for repair. If the inner door is the one that is inoperable, it is proposed to allow entry through the OPERABLE outer door, which means there is a short time during which the primary containment boundary is not intact (during access through the outer door). The proposed allowance will have strict administrative controls, which are detailed in the Bases. A dedicated (i.e., not involved with

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 (cont'd) any repair or other maintenance effort) individual will be assigned to ensure: 1) the door is opened only for the period of time required to gain entry into or exit from the air lock, and 2) the OPERABLE door is re-locked prior to the departure of the dedicated individual.

Repairs are directed towards reestablishing two OPERABLE doors in the air lock. Two OPERABLE doors closed is clearly the most desirable plant condition for air locks. The CTS 3.7.C Actions, in some circumstances, allow indefinite operation with only one OPERABLE door locked closed. Two OPERABLE doors closed is clearly an improvement on safety over one OPERABLE door locked closed. By not allowing access to make repairs, the CTS 3.7.C Actions could result in an inability of the plant to establish and maintain this highest level of safety possible (two OPERABLE doors closed), without a forced plant shutdown.

Therefore, allowing entry and exit, while temporarily allowing loss of containment integrity, is proposed based on the expected result of restoring two OPERABLE doors to the air lock. Restricting this access to make repairs of an inoperable door or air lock ensures this allowance applies only towards meeting this goal. This change is acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which the containment integrity is compromised, and the increased safety attained by completing repairs such that two OPERABLE doors can be closed.

L.2 In reference to immediately maintaining an air lock door closed, the word "maintain" in CTS 3.7.C Actions 1.a and 3 is changed to "verify" and 1 hour is allowed to complete the verification in ITS 3.6.1.2 (Required Actions A.1 and C.2). This change is acceptable because the level of degradation associated with the CTS Actions is no worse than that allowed for Primary Containment Integrity (CTS 3.7.A) not maintained. CTS 3.7.A (ITS 3.6.1.1) allows the primary containment to be inoperable for 1 hour. Also, the primary containment air lock doors are normally closed except for entry and exit. Therefore, the probability that the OPERABLE air lock door is open is low during the 1 hour period.

L.3 Notes have been added to CTS 3.7.C Actions 1.b and 2 (ITS 3.6.1.2 Required Actions A.3 and B.3) to allow administrative means to be used to verify locked closed OPERABLE air lock doors in high radiation areas or areas with limited access due to inerting. The air locks are initially verified to be in the proper position and access to them is restricted during operation due to the high levels of radiation or since the containment is inerted. Therefore, the probability of misalignment of the air locks are acceptably small. Eliminating the physical

TECHNICAL CHANGES -LESS RESTRICTIVE

L.3 (cont'd) door verification in areas of high radiation and inerting removes a risk to personnel safety. Also, not requiring access to areas of high radiation to verify proper containment air lock door alignment reduces exposure to plant personnel and is consistent with the As-Low-As-Reasonably-Achievable (ALARA) concept.

L.4 CTS 3.7.C Action 1 footnote b limits the time an inoperable primary containment air lock door can be used to facilitate the removal of personnel for a cumulative time not to exceed one hour per year. The ITS does not include a cumulative time period per year to limit entry and exit into the primary containment with one inoperable air lock door, however, the use of the air lock will be limited to an explicit time period for any single entry into the Condition as long as administrative controls are imposed. ITS 3.6.1.2 Required Action A Note 2 is added to the Technical Specifications to allow entry through a closed and/or locked OPERABLE air lock door (for reasons other than repairs) for 7 days under administrative controls. The new allowance is proposed to have strict administrative controls, which are detailed in the Bases. A dedicated (i.e., not involved with any repair or other maintenance effort) individual will be assigned to ensure: 1) the door is opened only for the period of time required to gain entry or exit from the air lock, and 2) the OPERABLE door is re-locked prior to the departure of the dedicated individual.

Operating history indicates that the air lock is reliable, and reliance on the cumulative time provision (60 minutes per year) has been infrequent. One OPERABLE air lock door closed is sufficient to maintain the containment integrity function and allow continued operation. The new administrative controls will ensure the time the OPERABLE air lock door is opened is minimized for any single entry into Condition (ACTION A). The 7 day allowance will allow sufficient time to perform maintenance and inspections as well as allowing access for operational consideration, such as preventative maintenance; but at the same time provides a reasonable time limit to allow these activities without repairing the air lock door. In certain circumstances (an air lock door is found to be inoperable at the beginning of the year where the cumulative time is reset to zero) this change may actually result in a more restrictive requirement by requiring restoration of the inoperable air lock door to continue to allow these other activities inside the containment. However, should the air lock become inoperable and access not be allowed due to the cumulative limit, a plant shutdown could be forced in a short period of time due to failure to attend to these activities.

TECHNICAL CHANGES -LESS RESTRICTIVE

L.4 (cont'd) Therefore, allowing the OPERABLE door to be opened (temporarily allowing loss of containment integrity) for brief moments (as is currently allowed) during a 7 day period for any single entry into the Condition, is an acceptable exchange in risk; the risk of an event during the brief period of OPERABLE door opening for access, versus the risk associated with the transient of the plant shutdown that would follow from not attending to required activities within the containment.

L.5 The Frequency for the air lock interlock test, CTS 4.7.C.2 and footnote e, is proposed to be changed from at least once per 6 months, only upon entry into the primary containment air lock when primary containment is de-inerted, to 24 months in proposed SR 3.6.1.2.2. Typically, the interlock is installed after each refueling outage, verified OPERABLE with the Surveillance, and not disturbed until the next refueling outage. If the need for maintenance arises when the interlock is required, the performance of the interlock Surveillance would be required following the maintenance. In addition, when an air lock is opened during times the interlock is required, the operator first verifies that one door is completely shut before attempting to open the other door. Therefore, the interlock is not challenged except during actual testing of the interlock. Consequently, it should be sufficient to ensure proper operation of the interlock by testing the interlock on a 24 month interval.

Testing of the air lock interlock mechanism is accomplished through having one door not completely engaged in the closed position, while attempting to open the second door. Failure of this Surveillance effectively results in a loss of primary containment OPERABILITY. Administrative controls and training do not allow this interlock to be challenged for normal ingress and egress. One door is opened, all personnel and equipment as necessary are placed into the air lock, and then the door is completely closed prior to attempting to open the second door. This Surveillance is contrary to processes and training of conservative operation, in that it requires an operator to challenge an interlock during a MODE when the interlock function is required. The door interlock mechanism cannot be readily bypassed; linkages must be removed, which are under the control of station processes such as temporary modifications, primary containment closure procedures, and out of service practices. Failure rate of this physical device is very low based on the design of the interlock.

Historically, this interlock verification has had its Frequency chosen to coincide with the Frequency of the overall air lock leakage test. According to 10 CFR 50, Appendix J, Option A, this Frequency is once per 6 months. However, Appendix J, Option B, to which Quad Cities 1 and 2 are currently licensed, allows for an extension of the overall air lock leakage test Frequency to a maximum of 30 months.

TECHNICAL CHANGES -LESS RESTRICTIVE

L.5 (cont'd) Therefore, it is proposed to change the required Frequency for this Surveillance to 24 months (and, with the allowance of SR 3.0.2, this provides a total of 30 months, which corresponds to the overall air lock leakage test Frequency). In this fashion, the interlock can be tested in a MODE where the interlock is not required.

L.6 CTS 3.7.C Action 2 allows personnel entry and exit through the air lock with an inoperable mechanism provided one OPERABLE air lock door remains locked closed at all times and an individual is dedicated to assure that both air lock doors are not opened simultaneously. The requirement to have one air lock door "locked" closed at all times has been deleted. The proposed requirement is reflected in ITS 3.6.1.2 Required Action B Note 2 (Entry into and exit from primary containment is permissible under the control of a dedicated individual). The duties of this individual are to perform the function of the interlock; to ensure both air lock doors are not opened simultaneously. That is, one door will be closed at all times. The requirement to have one door "locked" closed is not necessary. As long as one door is closed the containment integrity function will be maintained and therefore the requirement is not necessary during entry and exit into the containment. Locking an air lock door does not allow normal operation of the air lock. More time is required for locking therefore personnel will spend more time in the air lock instead of performing safety related activities. When entry and exit is no longer required, CTS 3.7.C Action 2 requires at least one door to be "locked" closed. This requirement is retained in ITS 3.6.1.2 Required Action B.2 and is considered adequate. With the door locked the dedicated individual is no longer required and therefore locking the door prevents entry into the containment. The proposed requirements are considered adequate in ensuring primary containment integrity and at the same time control entry into the primary containment when the air lock mechanism is found to be inoperable.

RELOCATED SPECIFICATIONS

None

, excluding reactor building-suppression chamber vacuum breakers A.2

A.1

3.7 - LIMITING CONDITIONS FOR OPERATION

D. Primary Containment Isolation Valves

LCO 3.6.1.3 Each primary containment isolation valve and reactor instrumentation excess flow check valve shall be OPERABLE[(a)].

APPLICABILITY:

add proposed 2nd Applicability M.1

OPERATIONAL MODE(s) 1, 2 and 3. A.3

add proposed Note 2 to ACTIONS

ACTION:

add proposed Notes 3 and 4 to ACTIONS A.4

ACTIONS A and C

1. With one or more of the primary containment isolation valve(s)[(b)] A.2 inoperable, ~~maintain at least one isolation valve OPERABLE in each affected penetration that is open and~~ A.5 within 4 hours either: L.1
   a. ~~Restore the inoperable valve(s) to OPERABLE status, or~~ A.6
   b. Isolate each affected penetration by use of at least one deactivated automatic valve secured in the isolated position[(b)], or L.2 Required Action A.1 only — or check valve with flow secured
   c. Isolate each affected penetration by use of at least one closed manual valve or blind flange[(b)].

ACTION E — Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

add proposed ACTION B L.3

add proposed ACTION F M.1

4.7 - SURVEILLANCE REQUIREMENTS

D. Primary Containment Isolation Valves

L.5

1. ~~Each power-operated or automatic primary containment isolation valve shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair, or replacement work is performed on the valve or its associated actuator, control, or power circuit by performance of a cycling test and verification of isolation time.~~

SR 3.6.1.3.7

2. Each power-operated or automatic A.7 primary containment isolation valve required to close on an isolation signal, ~~except traversing in-core probe system explosive isolation valves,~~ L.6 shall be demonstrated OPERABLE at least once per ~~18~~ 24 LD.1 months by verifying that on a containment isolation test or actual signal each automatic isolation valve actuates to its isolation position.

LA.1

SR 3.6.1.3.5

3. The isolation time ~~of each power-operated or~~ automatic primary containment isolation valve shall be determined to be within its limit when tested pursuant to Specification 4.0.E.

SR 3.6.1.3.8

4. Each reactor instrumentation line excess flow check valve which fulfills a primary containment isolation function shall be demonstrated OPERABLE at least once per ~~18~~ 24 months by verifying that the valve ~~checks flow~~ actuates to the isolation position. LD.1 L.7

SR 3.6.1.3.4
SR 3.6.1.3.9

5. Each traversing in-core probe system explosive isolation valve shall be demonstrated OPERABLE:

M.2 add proposed SR 3.6.1.3.1

ACTIONS Note 1

a ~~Locked or sealed closed valves may be opened on an intermittent basis under administrative control.~~ L.4

b ~~Except main steam isolation valves (MSIVs). Required actions for inoperable MSIVs are provided in Specification 3.6.M.~~ A.2

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3.7 - LIMITING CONDITIONS FOR OPERATION

ACTION C 2. With one or more reactor instrumentation line excess flow check valves inoperable, ~~operation may continue and the provisions of Specification 3.0.C are not applicable~~ A.8 provided that within ~~4~~ 72 L.8 hours either:

~~a. The inoperable valve is restored to OPERABLE status, or~~ A.6

NOTE 3 to ACTIONS b. The instrument line is isolated ~~and the associated instrument is declared inoperable.~~ A.4

ACTION E Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4.7 - SURVEILLANCE REQUIREMENTS

a. At least once per 31 days by verifying the continuity of the explosive charge. SR 3.6.1.3.4

b. At least once per ~~18~~ 24 LD.1 months by removing at least one explosive squib from an explosive valve such that each explosive squib will be tested at least once per ~~90~~ 120 months, and initiating the removed explosive squib(s). ~~The replacement charge for the exploded squib(s) shall be from the same manufactured batch as the one fired or from another batch which has been certified by having at least one of that batch successfully fired. No squib shall remain in use beyond the expiration of its shelf-life or operating life, as applicable.~~ LA.2 SR 3.6.1.3.9

SR 3.6.1.3.10 6. ~~In accordance with the methods and~~ at the frequency specified by the Primary Containment Leakage Rate Testing Program, ~~verify total maximum pathway leakage~~ LA.3 for all main steam isolation valves (MSIVs) is ≤ 46 scfh when tested at P_t (25 psig).

3.6 - LIMITING CONDITIONS FOR OPERATION

M. Main Steam Line Isolation Valves A.9

LCO 3.6.1.3 Two main steam line isolation valves (MSIVs) per main steam line shall be OPERABLE with closing times ≥3 seconds
SR 3.6.1.3.6 and ≤5 seconds.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

add proposed Note 1 to ACTIONS L.4

add proposed Note 4 to ACTIONS A.4

add proposed Note 2 to ACTIONS A.3

ACTIONS A and D With one or more MSIVs inoperable, ~~maintain at least one MSIV OPERABLE in each affected main steam line that is open and~~ within 8 hours either: A.5

1. ~~Restore the inoperable valve(s) to OPERABLE status, or~~ A.6

2. Isolate the affected main steam line by use of a deactivated MSIV in the closed position. L.2

ACTION E Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

add ACTION B L.3

4.6 - SURVEILLANCE REQUIREMENTS

M. Main Steam Line Isolation Valves

SR 3.6.1.3.6 Each of the above required MSIVs shall be demonstrated OPERABLE by verifying full closure between 3 and 5 seconds when tested pursuant to Specification 4.0.E.

ITS 3.6.1.3

3.7 - LIMITING CONDITIONS FOR OPERATION

A. PRIMARY CONTAINMENT INTEGRITY

PRIMARY CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2[(a)] and 3.

ACTION:

Without PRIMARY CONTAINMENT INTEGRITY, restore PRIMARY CONTAINMENT INTEGRITY within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4.7 - SURVEILLANCE REQUIREMENTS

A. PRIMARY CONTAINMENT INTEGRITY

PRIMARY CONTAINMENT INTEGRITY shall be demonstrated:

1. Perform required visual examinations and leakage rate testing except for primary containment air lock testing in accordance with and at the frequency specified by the Primary Containment Leakage Rate Testing Program.

Required Actions A.2 and C.2 and SR3.6.1.3.2

L.9

and not locked, sealed, or secured

2. At least once per 31 days by verifying that all primary containment penetrations[(b)] not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed, except for valves that are open under administrative control as permitted by Specification 3.7.D.

add Note 2 to Required Action A.2 and C.2

L.10

Note 2 to SR3.6.1.3.2 and SR3.6.1.3.3

3. By verifying each primary containment air lock is in compliance with the requirements of Specification 3.7.C.

4. By verifying the suppression chamber is in compliance with the requirements of Specification 3.7.K.

see ITS 3.6.1.1

L.10

Note 1 to Required Action A.2 and C.2

Note 1 to SR 3.6.1.3.2 and SR 3.6.1.3.3

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a See Special Test Exception 3.12.A.

Required Actions A.2 and SR3.6.1.3.3

b Except valves, blind flanges, and deactivated automatic valves which are located inside the containment. Valves and blind flanges in high radiation areas may be verified by use of administrative controls. These penetrations shall be verified closed during each COLD SHUTDOWN except such verification need not be performed when the primary containment has not been de-inerted since the last verification or more often than once per 92 days.

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 3.7.D includes all requirements for PCIVs, except for main steam isolation valves (CTS 3/4.6.M) and reactor building - suppression chamber vacuum breakers (CTS 3/4.7.F). In ITS 3.6.1.3 all requirements for PCIVs are included, except for the requirements of the reactor building - suppression chamber vacuum breakers which are retained in ITS 3.6.1.7, "Reactor Building-to-Suppression Chamber Vacuum Breakers." Therefore, the ITS LCO 3.6.1.3 statement excludes the OPERABILITY of the reactor building - suppression chamber vacuum breakers. Since all requirements of PCIVs are included in ITS 3.6.1.3, except for reactor building - suppression chamber vacuum breakers, the cross reference in CTS 3.7.D Action 1 footnote b to MSIVs is excluded. Since this change does not change any technical requirements and is considered a presentation preference, this change is considered administrative.

A.3 This proposed change to the CTS 3.7.D and 3.6.M Actions provides more explicit instructions for proper application of the Actions for Technical Specification compliance. In conjunction with the proposed Specification 1.3, "Completion Times," the ITS 3.6.1.3 ACTIONS Note 2 ("Separate Condition entry is allowed for each penetration flow path") provides direction consistent with the intent of the existing Actions for inoperable isolation valves. It is intended that each inoperable penetration flow path is allowed a certain time to complete the Required Actions. Since this change only provides more explicit direction of the current interpretation of the existing specification, this change is considered administrative.

A.4 The ITS 3.6.1.3 ACTIONS include Notes 3 and 4. These Notes facilitate the use and understanding of the intent for a system made inoperable by inoperable PCIVs, that the applicable ACTIONS for that system also apply. This requirement is currently located in CTS 3.7.D Action 2.b, but it does not cover all situations. Therefore, ITS 3.6.1.3 ACTIONS Note 3 has been added to cover all situations. ITS 3.6.1.3 ACTIONS Note 4 clarifies that these "systems" include the primary containment. With ITS LCO 3.0.6, this intent would not

ADMINISTRATIVE

A.4 (cont'd) necessarily apply. The clarification is consistent with the intent and interpretation of the existing Technical Specifications, and is therefore considered administrative.

A.5 CTS 3.7.D Action 1 and the CTS 3.6.M Action do not specify penetrations with one or two isolation valves. However, ITS 3.6.1.3 Condition A applies if the affected penetration has two or more valves, and only one is inoperable. This inherently ensures maintaining "at least one isolation valve OPERABLE." In the case of containment penetrations designed with only one isolation valve (ITS 3.6.1.3 Condition C), the system boundary is considered an adequate barrier and the penetration is not considered "open" when the single isolation valve is open. This change is a presentation preference and is administrative in nature.

A.6 The revised presentation of CTS 3.7.D Actions 1.a and 2.a and CTS 3.6.M Action 1 (based on the BWR ISTS, NUREG-1433, Rev. 1) does not explicitly detail options to "restore...to OPERABLE status." This action is always an option, and is implied in all Actions. Omitting these actions from the ITS is editorial.

A.7 CTS 4.7.D.2 requires testing of each power operated or automatic PCIV required to close on an isolation signal, but specifically excludes testing requirements for the traversing in-core probe system explosive isolation valves. In addition, CTS 4.7.D.2 only requires each automatic isolation valve to be verified that it actuates to its isolation position. ITS SR 3.6.1.3.7 requires the verification that each automatic PCIV actuates to the isolation position on an actual (see Discussion of Change L.6 below) or simulated isolation signal. The explicit exclusion of the explosive isolation valves is not necessary since these valves are not required to close on an isolation (automatic) signal. Requirements for testing the TIP explosive isolation valves are included in CTS 4.7.D.5.a and b and retained in ITS SR 3.6.1.3.4 and 9, respectively. This change is considered administrative since no technical changes are being made. This change is consistent with the BWR ISTS, NUREG-1433, Rev. 1.

A.8 The allowance in CTS 3.7.D Action 2, which states that the provisions of Specification 3.0.C are not applicable, has been deleted since it is redundant to the "Otherwise..." action. That is, CTS LCO 3.0.C (ITS LCO 3.0.3) is not applicable anyway since a shutdown action has been provided. Therefore, deletion of these allowances is administrative.

ADMINISTRATIVE (continued)

A.9 CTS 3.7.M repeats most of the requirements, provisions, and actions for MSIVs separate from all other primary containment isolation valves in CTS 3.7.D. The ITS incorporate these requirements and associated restoration times into ITS 3.6.1.3, the primary containment isolation valve Specification. This is a presentation preference, except as noted by other Discussion of Changes for ITS: 3.6.1.3.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 An additional Applicability has been added to ITS 3.6.1.3 (i.e., when associated instrumentation is required to be OPERABLE per LCO 3.3.6.1, "Primary Containment Isolation Instrumentation"), which effectively adds a MODE 4 and 5 requirement to the RHR Shutdown Cooling System isolation valves. Operability of these valves is necessary to preclude an inadvertent draindown of the reactor vessel through the shutdown cooling isolation valves from lowering reactor vessel water level to the top of the fuel. Appropriate ACTIONS have been added (ITS 3.6.1.3 ACTION F) for when the valves cannot be isolated or restored within the current 4 hour limit. Since the unit is already in MODE 4 or 5, the CTS 3.7.D shutdown action would not provide any restriction. This change is an additional restriction on plant operation.

M.2 A new Surveillance Requirement has been added. This Surveillance Requirement (SR 3.6.1.3.1) verifies the 18 inch vent and purge valves, except the torus purge valves, are closed every 31 days except during operations which require them to be open (inerting, de-inerting, pressure control, ALARA or air quality considerations for personnel entry, and Surveillances that require the valves to be open) provided the drywell vent and purge valves and their associated suppression chamber vent and purge valves are not open simultaneously. This will ensure the valves are in their accident position, thus helping to ensure the offsite releases are within the limits if a LOCA were to occur. This SR is an additional restriction on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 CTS 4.7.D.3 requires the isolation time of power operated or automatic PCIVs to be verified within limits when tested pursuant to Specification 4.0.E (the Inservice Test (IST) Program requirements). The requirement to stroke time test the power operated, non-automatic, PCIVs has been relocated to the IST Program. The ISTS Bases for SR 3.6.1.3.5 state that the "isolation time test ensures that the valve will isolate in a time period less than or equal to that assumed in the safety analysis." Certain power operated PCIVs do not receive an automatic isolation signal, and their time is not assumed in the safety analysis, since it requires operator action to close the valves. Due to this, in the Quad Cities 1 and 2 PCIV table (which is located outside of Technical Specifications), the isolation time for the power operated, non-automatic valves are listed as "NA." However, the IST Program, required by 10 CFR 50.55a, provides requirements for the testing of all ASME Code Class 1, 2, and 3 valves in accordance with applicable codes, standards, and relief requests, endorsed by the NRC for Quad Cities 1 and 2. Testing of the power operated, non-automatic valves includes applicable stroke times. Compliance with 10 CFR 50.55a, and as a result the IST Program and implementing procedures, is required by the Quad Cities 1 and 2 Operating License. These controls are adequate to ensure the required testing to demonstrate OPERABILITY is performed. Therefore, the relocated requirements are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the relocated requirements in the IST Program will be controlled by the provisions of 10 CFR 50.59 and 10 CFR 50.55a.

LA.2 Requirements in CTS 4.7.D.5.b concerning the replacement charges for the traversing in-core probe (TIP) explosive valves are proposed to be relocated to the Bases. These details are not necessary to ensure that the TIP System explosive isolation valves are maintained OPERABLE. The requirements of ITS 3.6.1.3, SR 3.6.1.3.4, and SR 3.6.1.3.9 are adequate to ensure the OPERABILITY of the TIP system explosive isolation valves. Therefore, the relocated requirements are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

LA.3 The detail in CTS 4.7.D.6 that the main steam isolation valve leakage is on a maximum pathway leakage basis in accordance with the methods of the Primary Containment Leakage Rate Testing Program is proposed to be relocated to the Bases. The requirement in proposed SR 3.6.1.3.10 to verify the combined leakage rate for all MSIV leakage paths is $\leq$ 46 scfh when tested at $\geq$ 25 psig is sufficient to ensure the current requirement is met. The proposed Bases for SR 3.6.1.3.10 indicates that the leakage rate of each main steam isolation valve path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves). If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. Therefore, the relocated requirements are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

LD.1 The Frequencies for performing CTS 4.7.D.2, 4.7.D.4, and 4.7.D.5.b have been extended from 18 months to 24 months in proposed SRs 3.6.1.3.7, 3.6.1.3.8, and 3.6.1.3.9 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow these Surveillances to extend their Surveillance Frequency from the current 18 month Surveillance Frequency (90 months for CTS 4.7.D.5.b) (i.e., a maximum of 22.5 months (112.5 months for CTS 4.7.D.5.b) accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (120 months for SR 3.6.1.3.9) (i.e., a maximum of 30 months (150 months for SR 3.6.1.3.9) accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

SR 3.6.1.3.7 ensures that each automatic PCIV will actuate to its isolation position on a primary containment isolation signal. During the operating cycle, PCIVs are either exercised (closed or open), partially stroked (open or close) or, in accordance with the IST program, justifications exist to document less frequent testing. The exercise or partial stroke testing of these PCIVs tests a significant portion of the PCIV's circuitry and will detect failures of this circuitry or failures with valve movement. The PCIVs, including the actuating logic, are designed to be single failure proof and therefore are highly reliable. Furthermore, as stated in the NRC Safety Evaluation Report (dated August 2, 1993) relating to extension of the Peach Bottom Atomic Power Station, Unit Numbers 2 and 3 surveillance intervals from 18 to 24 months:

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd)

"Industry reliability studies for boiling water reactors (BWRs), prepared by the BWR Owners Group (NEDC-30936P) show that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic system, but by that of the mechanical components, (e.g., pumps and valves), which are consequently tested on a more frequent basis. Since the probability of a relay or contact failure is small relative to the probability of mechanical component failure, increasing the logic system functional test interval represents no significant change in the overall safety system unavailability."

Extension of the LOGIC SYSTEM FUNCTIONAL TEST has been previously justified. Based on the testing of the valves, the reliability of the PCIVs and the redundant nature of containment isolation, the impact, if any, of this change on system availability is minimal.

SR 3.6.1.3.8 requires a demonstration that each instrument line excess flow check valve (EFCV) actuates to the isolation position on an actual or simulated instrument line break condition. This SR provides assurance that the instrumentation line EFCVs will perform as designed. The 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. Furthermore the design basis for the Containment Isolation System states that a failure of an individual excess flow check valve combined with a break in the associated instrument line are mitigated since dead-end instrument sensing lines that are in communication with the reactor pressure boundary and penetrate the primary containment are equipped with 1/4 inch piping within the secondary containment. Instrument lines have been designed to meet the requirements of Regulatory Guide 1.11. These lines are Seismic Category I and terminate in instruments that are Seismic Category I. They are provided with 1/4 inch piping in the secondary containment, manual isolation valves, and excess flow check valves. The piping in the secondary containment is sized to assure that in the event of a postulated failure of the piping or component, the potential offsite exposure would be substantially below the guideline of 10 CFR 100.

SR 3.6.1.3.9 requires that the explosive squib be removed and tested for the shear isolation valve of the TIP System. An in place functional test is not possible with this design. The replacement charge for the explosive squib is from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. Other

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) administrative controls, such as those that limit the shelf life and operating life, as applicable, of the explosive charges, are followed. The Frequency of 24 months on a STAGGERED TEST BASIS is considered adequate given the administrative controls on replacement charges and the more frequent checks on a 31 day basis of circuit continuity per SR 3.6.1.3.4.

Reviews of historical maintenance and surveillance data have shown that these tests normally pass their Surveillances at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequencies (120 months for SR 3.6.1.3.9), if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months or 150 months, as applicable) do not invalidate any assumptions in the plant licensing basis.

"Specific"

L.1 CTS 3.7.D Action 1 requires an inoperable PCIV to be restored or the affected penetration isolated in 4 hours for all primary containment penetration flow paths (except for inoperabilities associated with main steam isolation valves (MSIVs) and reactor building - suppression chamber vacuum breakers). ITS Required Action C.1 (second Completion Time) allows 72 hours to isolate the affected penetration when a PCIV is inoperable in a penetration with a closed system and only one PCIV. For PCIVs in a penetration with a closed system and only one PCIV, they are either in a closed system, as specifically defined in NUREG-0800 (the Standard Review Plan), section 6.2.4, or they are in a penetration whose system piping communicates with the suppression pool and is expected to remain submerged during a LOCA. The NRC has allowed this design for Quad Cities 1 and 2 and other BWRs and, while the reason these types of penetrations meet the requirements of the General Design Criteria (GDC) is not specifically described in the Standard Review Plan, they meet the GDC requirements for being classified as a closed system inside the containment because they satisfy "other defined bases" established by the NRC to meet the GDC requirements. The additional time is reasonable for the closed system valves since the intact piping or the water seal acts as the penetration isolation barrier and ensures that the primary containment boundary is maintained intact until another barrier can be established to isolate the penetration. This additional time also avoids the potential for a plant shutdown and provides time to repair the inoperable PCIV in lieu of isolating the penetration (which could result in an inoperable ECCS subsystem, since the water sealed PCIVs are only in ECCS penetrations).

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.2 CTS 3.7.D Action 1.c and CTS 3.6.M Action 2 list some, but not all, of the possible acceptable isolation devices that may be used to satisfy the need to isolate a penetration with an inoperable isolation valve. ITS 3.6.1.3 ACTIONS provide a complete list of acceptable isolation devices. Since the result of the ACTIONS continues to be an acceptably isolated penetration for continued operation, the proposed change does not adversely affect safe operation. Many penetrations are designed with check valves as acceptable isolation barriers. With forward flow in the line secured, a check valve is essentially equivalent to a closed manual valve. For those penetrations designed with check valves as acceptable isolation devices, the ITS provides an equivalent level of safety. For penetrations not designed with check valves for isolation, the ITS does not affect the requirements to isolate with a closed deactivated automatic valve, closed manual valve, or blind flange. ITS ACTIONS allowing closed manual valves or check valves with flow secured also apply to isolating main steam lines, even though the design does not provide for these type of isolation devices. This change is simply a result of simplicity in providing a consistent presentation for all penetrations. While this apparent flexibility does not result in any actual technical change in the Technical Specifications, it is listed here for completeness.

L.3 In the event two or more valves in a penetration are inoperable, CTS 3.7.D Action 1 and the CTS 3.6.M Action for MSIVs, which require maintaining one isolation valve OPERABLE, would not be met and an immediate shutdown would be required. ITS 3.6.1.3 ACTION B provides 1 hour prior to commencing a required shutdown. This proposed 1 hour period is consistent with the existing time allowed for conditions when the primary containment is inoperable. The proposed change will provide consistency in ACTIONS for these various primary containment degradations. This change to CTS 3.7.D and 3.6.M is acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which continued operation is allowed and the capability to isolate a primary containment penetration is lost.

L.4 An allowance is proposed for intermittently opening, under administrative control, closed primary containment isolation valves, other than those currently allowed to be opened using CTS 3.7.D LCO footnote a (locked or sealed closed valves). The allowance is presented in ITS 3.6.1.3 ACTIONS Note 1, and in Note 2 to SR 3.6.1.3.2 and SR 3.6.1.3.3. Opening of primary containment penetrations on an intermittent basis is required for performing surveillances, repairs, routine evolutions, etc. Intermittently opening closed PCIVs is

TECHNICAL CHANGES - LESS RESTRICTIVE

L.4 (cont'd) acceptable due to the low probability of an event that could pressurize the primary containment during the short time in which the PCIV is open and the administrative controls established to ensure the affected penetration can be isolated when a need for primary containment isolation is indicated.

L.5 CTS 4.7.D.1 is proposed to be deleted. Any time the OPERABILITY of a system or component has been affected by repair, maintenance, or replacement of a component, post maintenance testing is required to demonstrate OPERABILITY of the system or component. After restoration of a component that caused a required SR to be failed, ITS SR 3.0.1 requires the appropriate SRs (in this case SR 3.6.1.3.5 and SR 3.6.1.3.6, as applicable) to be performed to demonstrate OPERABILITY of the affected components. Therefore, explicit post maintenance Surveillance Requirements are not required and have been deleted from the Technical Specifications.

L.6 The phrase "actual or," in reference to the isolation test signal in CTS 4.7.D.2, has been added to proposed SR 3.6.1.3.7, which verifies that each PCIV actuates on an automatic isolation signal. This allows satisfactory automatic PCIV isolations for other than Surveillance purposes to be used to fulfill the Surveillance Requirement. Operability is adequately demonstrated in either case since the PCIV itself cannot discriminate between "actual" or "test" signals.

L.7 The requirement in CTS 4.7.D.4 that each excess flow check valve must check flow has been deleted. Proposed SR 3.6.1.3.8 now requires the EFCVs to actuate to their isolation position (i.e., closed) on an actual or simulated instrument line break signal. The requirements for the EFCVs are provided in 10 CFR 50 Appendix A, GDCs 55 and 56, and as further detailed in Regulatory Guide 1.11. These requirements state that there should be a high degree of assurance that the EFCVs will close or be closed if the instrument line outside containment is lost during normal reactor operation, or under accident conditions. The Instrument Line Break Analysis in the Quad Cities 1 and 2 UFSAR Section 15.6.2 assumes both the EFCV and the manual block valve to be unavailable, i.e., fail to close; the accident is terminated by cooling down the plant and closing the manual valve after the plant is shutdown and depressurized. Therefore, since the actual leakage is not an assumption of the accident analysis (the leakage is assumed to be the maximum allowed through the broken line), the leakage limit (i.e., check flow) has been deleted.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.8 CTS 3.7.D Action 2 allows 4 hours to either repair the inoperable excess flow check valve or isolate the associated instrument. ITS 3.6.1.3 Required Action C.1 has extended this time to 72 hours. In this event, a limiting event would still be assumed to be within the bounds of the safety analysis (the excess flow check valves are not credited in the safety analysis - see Discussion of Change L.7 above). Allowing an extended restoration time, to potentially avoid a plant transient caused by the forced shutdown, is reasonable based on the probability of a EFCV line break event and does not represent a significant decrease in safety.

L.9 The requirements of CTS 4.7.A.2, related to verification of the position of primary containment isolation penetrations not capable of being closed by OPERABLE automatic PCIVs, are revised in proposed SR 3.6.1.3.2 and SR 3.6.1.3.3 to exclude verification of manual valves and blind flanges that are locked, sealed, or otherwise secured in the correct position. The purpose of CTS 4.7.A.2 is to ensure that manual primary containment isolation devices that may be misaligned are in the correct position to help ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is within design and analysis limits. For manual valves or blind flanges that are locked, sealed, or otherwise secured in the correct position, the potential of these devices to be inadvertently misaligned is low. In addition, manual valves and blind flanges that are locked, sealed, or otherwise secured in the correct position are verified to be in the correct position prior to locking, sealing, or securing. As a result of this control of the position of these manual primary containment isolation devices, the periodic Surveillance of these devices in CTS 4.7.A.2 is not required to help ensure that post accident leakage of radioactive fluids or gases outside the primary containment boundary is maintained within design and analysis limits. This change also provides the benefit of reduced radiation exposure to plant personnel through the elimination of the requirement to check the position of manual valves and blind flanges, located in radiation areas, that are locked, sealed, or otherwise secured in the correct position.

L.10 CTS 4.7.A.2 requires verification that certain primary containment penetrations are isolated. However, CTS 4.7.A.2 footnote b allows this verification to be by use of administrative controls if the penetrations are located inside the containment. An allowance is proposed to allow the verification of the isolation devices used to isolate the penetrations in high radiation areas to be verified by use of administrative means whether or not the device is located inside the containment. The allowance is presented in Note 1 to ITS Required Actions A.2 and C.2, and SR 3.6.1.3.2. This allowance is considered acceptable since access to these areas is typically restricted in MODES 1, 2, and 3 for ALARA reasons. Therefore, the probability of misalignment once they have been verified to be in

TECHNICAL CHANGES - LESS RESTRICTIVE

L.10 (cont'd) the proper position is low. If for some reason these devices are opened (e.g., maintenance), the associated procedure or work package would require their closure after the work is completed. The Required Action or Surveillance may be performed by reviewing that no work was performed in the associated radiation area since the isolation device was closed or if work was performed in the area that closure was verified upon completion of the work if the valve was opened.

In addition, an allowance is proposed to allow verification of isolation devices that are locked, sealed, or otherwise secured to also be performed using administrative means. The allowance is presented in Note 2 to ITS Required Actions A.2 and C.2. Plant procedures control the operation of locked, sealed, or otherwise secured isolation devices; thus the potential for inadvertent misalignment of these devices after locking, sealing, or otherwise securing is low. In addition, the isolation devices were verified to be in the correct position prior to locking, sealing, or otherwise securing.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

G. Drywell Internal Pressure

LCO 3.6.1.4 The drywell internal pressure shall not exceed +1.5 psig~~[a]~~. A.2

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

~~1. With the drywell internal pressure <1.0 psig during the applicable time period for OPERATIONAL MODE 1, restore the internal pressure to above the low pressure limit within 24 hours or reduce THERMAL POWER to <15% RATED THERMAL POWER within the next 8 hours.~~ A.2

ACTION A 2. With the drywell internal pressure otherwise outside of the specified limits, restore the internal pressure to within the limits within 1 hour or be in

ACTION B at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4.7 - SURVEILLANCE REQUIREMENTS

G. Drywell Internal Pressure

SR 3.6.1.4.1 The drywell internal pressure shall be determined to be within the limits at least once per 12 hours.

A.2

~~a In OPERATIONAL MODE 1, during the time period beginning within 24 hours after THERMAL POWER is >15% of RATED THERMAL POWER following startup, and ending within 24 hours prior to reducing THERMAL POWER to <15% of RATED THERMAL POWER preliminary to a scheduled reactor shutdown, the drywell internal pressure shall also be maintained ≥1.0 psig (except for up to 4 hours for required surveillance which reduces the differential pressure.)~~

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The requirement in CTS 3.7.G footnote a, concerning the minimum drywell internal pressure (≥1.0 psig) has been deleted. As stated in the CTS Bases for CTS 3.7.G, the minimum pressure above 15% RTP is based on the assumptions in the post-accident hydrodynamic loading analysis. However, the requirement in CTS 3.7.H (Drywell - Suppression Chamber Differential Pressure) to maintain differential pressure between the drywell and the suppression chamber ≥1.0 psid is sufficient to minimize the hydrodynamic loads on the torus during the blowdown. The requirements of CTS 3.7.H have been included in ITS 3.6.2.5. The intent of the requirement in CTS 3.7.G footnote a is to help ensure the differential pressure is maintained within limits by keeping the drywell at the proper pressure to ensure the differential pressure limit is met, thus it effectively is a cross reference to another Technical Specification. Therefore, its removal is considered administrative. In addition, CTS 3.7.G Action 1, which provides the actions when the pressure limit required by the footnote is not met, has also been deleted. This Action is consistent with CTS 3.7.H Action 1, which is maintained in ITS 3.6.2.5.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

M.1

ITS 3.6.1.5

Insert New Specification 3.6.1.5

Insert new Specification 3.6.1.5, "Drywell Air Temperature," as shown in the Quad Cities 1 and 2 Improved Technical Specifications.

DISCUSSION OF CHANGES
ITS: 3.6.1.5 - DRYWELL AIR TEMPERATURE

ADMINISTRATIVE

None

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 A new Specification is proposed to be added requiring drywell average air temperature to be $\leq 150°F$ during operations in MODES 1, 2, and 3. This is required because the accident analyses of UFSAR, Section 6.2 assumes this temperature as an initial condition in the containment analysis. Appropriate ACTIONS and a Surveillance Requirement are also proposed to be added consistent with the BWR ISTS, NUREG-1433, Rev. 1. This change represents an additional restriction on plant operation necessary to ensure the analysis assumptions relative to the containment analyses can be met.

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

A.1

Low Set

A.2

3.6 - LIMITING CONDITIONS FOR OPERATION

F. Relief Valves

LCO 3.6.1.6 5 reactor coolant system relief valves and the reactuation time delay of two relief valves shall be OPERABLE with the following settings:

<see ITS 3.4.3>

The two low set relief valves shall be OPERABLE

A.2

Relief Function Setpoint (psig)
Open
≤1115 psig
≤1115 psig
≤1135 psig
≤1135 psig
≤1135 psig[(a)]

<see ITS 3.3.6.3>

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

1. ~~With one or more relief valves open, provided that suppression pool average water temperature is <110°F, take action to close the open relief valve(s); if suppression pool average water temperature is ≥110°F place the reactor mode switch in the Shutdown position.~~

L.1

4.6 - SURVEILLANCE REQUIREMENTS

F. Relief Valves

1. The relief valve function and the reactuation time delay function instrumentation shall be demonstrated OPERABLE by performance of a:

   a. CHANNEL FUNCTIONAL TEST of the relief valve function at least once per 18 months, and a

   b. CHANNEL CALIBRATION and LOGIC SYSTEM FUNCTIONAL TEST of the entire system at least once per 18 months.

<see ITS 3.3.6.3>

2. Deleted.

add proposed SRs 3.6.1.6.1 and 3.6.1.6.2

A.3

<See ITS 3.3.6.3>

a Target Rock combination safety/relief valve.

3.6 - LIMITING CONDITIONS FOR OPERATION

4.6 - SURVEILLANCE REQUIREMENTS

ACTION A

2. With the relief valve function and/or the reactuation time delay of one of the above required reactor coolant system relief valves inoperable, restore the inoperable relief valve function and the reactuation time delay function to OPERABLE status within 14 days or be

(see ITS 3.3.6.3)

ACTION B

in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With the relief valve function and/or the reactuation time delay of more than one of the above required reactor coolant system relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

ACTION B

(see ITS 3.3.6.3)

4. Deleted.

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 3.6.F includes the OPERABILITY requirements for the relief valves, including the low set relief valve group. In ITS LCO 3.6.1.6, only the two low set relief valves are required to be OPERABLE. The low set relief valves provide a dual purpose, that is to support the transient and loss of coolant analysis in the relief mode and to support the containment analyses by minimizing the loads induced on the containment loading in the low set relief mode. ITS 3.6.1.6 will ensure the low set relief valves are OPERABLE to support the containment analysis. This change is consistent with the format of the BWR ISTS, NUREG-1433, Rev. 1. The relief mode and the instrumentation requirements will be addressed in ITS 3.4.3 and ITS 3.3.6.3, respectively.

A.3 Two new Surveillance Requirements are proposed to be added. Proposed SR 3.6.1.6.1 ensures the low set relief valves open when manually actuated. This ensures that the valves and solenoids are functioning properly and that no blockage exists in the lines. Proposed SR 3.6.1.6.2 ensures that the low set relief valves will actuate automatically on receipt of specific initiation signals by performance of a system functional test. These proposed Surveillance Requirements are consistent with current testing requirements in CTS 4.5.A.4.a and b (for ADS) except as modified in the Discussion of Changes for ITS 3.5.1, "ECCS — Operating." Since the inoperabilities associated with the mechanical portions of the ADS valves (which are also relief valves) will require entry into both the Actions of CTS 3.6.F as well as the Action of CTS 3.5.A the duplication of the SRs in ITS 3.6.1.6 is considered administrative. This change is consistent with the format of the BWR ISTS, NUREG-1433, Rev. 1.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 3.6.F Action 1 requires action to close an open relief valve provided the suppression pool temperature is < 110°F. If unable to close the open relief valve or if suppression pool temperature is $\geq$ 110°F, the reactor mode switch must be placed in shutdown. This Action is not included in the ITS. Required Actions for open relief valves are implicit in CTS 3.7.K Action 4 and ITS 3.6.2.1. Required Action D.1 of ITS 3.6.2.1 will also require that the reactor mode switch be immediately placed in shutdown if the suppression pool average temperature is $\geq$ 110°F. Action 1 of CTS 3.6.F is anticipatory of this requirement in the event of an open relief valve, and preemptive in all cases. This Action represents detailed methods of responding to an event and not necessarily a compensatory action for failure to meet this LCO. As such, it is not appropriate for the ITS and is adequately addressed in Quad Cities 1 and 2 Emergency Operating Procedures and Special Operating Procedures and by ITS 3.6.2.1, the Suppression Pool Temperature LCO. Therefore, CTS 3.6.F, Action 1 is proposed to be deleted from Technical Specifications.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

F. Reactor Building - Suppression Chamber Vacuum Breakers

LCO 3.6.1.7 All reactor building - suppression chamber vacuum breakers shall be OPERABLE ~~and closed~~. LA.1

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

A.2 add proposed ACTIONS Note

ACTION:

1. With one reactor building - suppression chamber vacuum breaker line inoperable for opening with both valves known to be closed, restore the inoperable vacuum breaker line to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. (ACTION C; ACTION E) L.1 add proposed ACTION D

2. With one reactor building - suppression chamber vacuum breaker line otherwise inoperable, verify at least one vacuum breaker in the line to be closed within ~~2~~ 1 hours and restore the open vacuum breaker to the closed position within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. (ACTION A; ACTION B; ACTION A; ACTION E) M.1

3. ~~With the position indicator of the air operated reactor building - suppression chamber vacuum breaker inoperable, restore the inoperable position indicator to OPERABLE status within 14 days or verify the vacuum breaker to be closed at least once per 24 hours by an~~ L.2

4.7 - SURVEILLANCE REQUIREMENTS

F. Reactor Building - Suppression Chamber Vacuum Breakers

A.3 Each reactor building - suppression chamber vacuum breaker shall be: add proposed Notes 1 and 2 to SR 3.6.1.7.1

SR 3.6.1.7.1 1. Verified closed at least once per ~~7~~ 14 days. L.3

2. Demonstrated OPERABLE:

SR 3.6.1.7.2 a. At least once per 92 days when tested pursuant to Specification 4.0.E by:

1) Cycling the vacuum breaker through at least one test cycle.

2) ~~Verifying the air operated vacuum breaker position indicator OPERABLE by observing expected valve movement during the cycling test.~~ L.2

b. At least once per ~~18~~ 24 months by: LD.1

SR 3.6.1.7.3 1) Demonstrating that the force required to open each vacuum breaker does not exceed the equivalent of 0.5 psid.

2) ~~Verifying the air operated vacuum breaker position indicator OPERABLE by performance of a CHANNEL CALIBRATION.~~ L.2

3.7 - LIMITING CONDITIONS FOR OPERATION

4.7 - SURVEILLANCE REQUIREMENTS

~~alternate means. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.~~

L.2

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 This proposed change to CTS 3.7.F adds an Action Note which provides more explicit instructions for proper application of the Actions for Technical Specification compliance. In conjunction with the proposed Specification 1.3, "Completion Times," the ITS 3.6.1.7 Note ("Separate Condition entry is allowed for each line") provides direction consistent with the intent of the existing Actions for inoperable vacuum breakers. It is intended that each inoperable vacuum breaker line is allowed a certain time to complete the Required Actions. Since this change only provides more explicit direction of the current interpretation of the existing specification, this change is considered administrative.

A.3 Two Notes have been added to CTS 4.7.F.1, the Surveillance that verifies the vacuum breakers are closed. Note 1 to SR 3.6.1.7.1 has been added to clearly state that the vacuum breakers do not have to be closed when performing required Surveillances (i.e., SR 3.6.1.7.2 and SR 3.6.1.7.3) that open the vacuum breakers. Note 2 to SR 3.6.1.7.1 has been added to clearly state that the vacuum breakers do not have to be closed when they are performing their intended function, which is to open to relieve vacuum. Since it is obvious that OPERABILITY is still being maintained, this addition is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 3.7.F Action 2 requires the verification that at least one vacuum breaker in the line is closed within 2 hours if it is determined that one vacuum breaker is not closed (otherwise inoperable). The CTS 3.7.A Action for primary containment integrity would require restoration within 1 hour or shutdown in this case. CTS 3.7.F Action 2 is revised to provide 1 hour (ITS 3.6.1.7 ACTION B) to close at least one vacuum breaker in the line, consistent with the proposed Primary Containment Specification (ITS LCO 3.6.1.1). This change is an additional restriction on plant operation but necessary to ensure that the potential for loss of primary containment integrity is minimized.

TECHNICAL CHANGES - LESS RESTRICTIVE

'Generic"

LA.1 The CTS 3.7.F detail comprising what "OPERABLE" means (i.e, closed) for the reactor building-to-suppression chamber vacuum breakers is proposed to be relocated to the Bases. The requirement that the vacuum beakers be closed is also explicitly required in proposed SR 3.6.1.7.1 and is not needed to be repeated in the LCO statement. As such, this relocated detail is not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the Bases Control Program described in Chapter 5 of the ITS.

LD.1 The Frequency for performing CTS 4.7.F.2.b has been extended from 18 months to 24 months in proposed SR 3.6.1.7.3 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow this Surveillance to extend the Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991. CTS 4.7.F.2.b.1 requires that the reactor building-to-suppression chamber vacuum breaker butterfly valve opening setpoint be verified every

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) 18 months. This SR ensures that each reactor building-to-suppression chamber vacuum breaker check valve and vacuum breaker butterfly valve is capable of performing its safety function as assumed in the safety analysis. ITS SR 3.6.1.7.2 requires that each vacuum breaker must be functionally tested once per 92 days by cycling each reactor building-to-suppression chamber vacuum breaker check valve and vacuum breaker butterfly valve to ensure that it opens adequately to perform its design function and returns to the fully closed position. This more frequent testing performed during the operating cycle, although not ensuring the specified setpoint, does ensure that the vacuum breaker check valves and vacuum breaker butterfly valves are capable of being cycled open and shut. Furthermore, the vacuum relief system design for the active components provides two 100% redundant relief paths. Therefore, based on the more frequent testing and the design of the vacuum relief system, the impact, if any, of this change on system availability is minimal.

Reviews of historical maintenance and surveillance data have shown that this test normally passes the Surveillance at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequency, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) does not invalidate any assumptions in the plant licensing basis.

"Specific"

L.1 CTS 3.7.F Action 1 allows only one reactor building-to-suppression chamber vacuum breaker line to be inoperable for opening without requiring a shutdown. With two vacuum breaker lines inoperable for opening, entry into CTS 3.0.C is required and the plant must commence a reactor shutdown within one hour. In ITS 3.6.1.7, proposed ACTION D allows two lines to have all vacuum breakers inoperable for opening for up to one hour without requiring a shutdown (as is currently required by CTS LCO 3.0.C). This one hour limit is consistent with the time provided in CT 3.7.A for an inoperable primary containment, which is effectively the status of the plant if one or both vacuum breakers in both lines will not open. If these Required Actions and associated Completion Times are not met, ITS 3.6.1.7 ACTION E will require a plant shutdown to MODE 3 in 12 hours and MODE 4 in 36 hours, which is also consistent with the current time provided in CTS 3.0.C.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.2 The vacuum breaker position indication instrumentation in CTS 3.7.F Action 3, CTS 4.7.F.2.a.2), and CTS 4.7.F.2.b.2) does not necessarily relate directly to the respective system OPERABILITY. The BWR ISTS, NUREG-1433 does not specify indication-only equipment to be OPERABLE to support OPERABILITY of a system or component. Control of the availability of, and necessary compensatory activities if not available, for indications and monitoring instruments are addressed by plant operational procedures and policies. Vacuum breaker position is required to be known to be able to satisfy the ITS 3.6.1.7 Surveillance Requirements (SR 3.6.1.7.1, SR 3.6.1.7.2, and SR 3.6.1.7.3) for the vacuum breakers. If position indication is not available and vacuum breaker position can not be determined, then the Surveillance Requirements cannot be satisfied and the appropriate actions must be taken for inoperable vacuum breakers in accordance with the ACTIONS of ITS 3.6.1.7. As a result, the requirements for the vacuum breaker position indication are adequately addressed by the requirements of ITS 3.6.1.7 and the associated SRs and are proposed to be deleted from Technical Specifications.

L.3 The Frequency for CTS 4.7.F.1, which requires verifying the vacuum breakers are closed, has been extended from 7 days to 14 days in proposed SR 3.6.1.7.1. For the position verification, most other safety-related valves, including those that affect primary containment, are verified once per 31 days. Therefore, based on this extended interval for similar requirements on component position Surveillances, and the fact that the valves are normally found in their correct position, the 14 day Frequency is considered adequate.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

E. Suppression Chamber - Drywell Vacuum Breakers

LCO 3.6.1.8 Nine suppression chamber - drywell vacuum breakers shall be OPERABLE and twelve suppression chamber - drywell vacuum breakers shall be closed.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION: M.1

ACTION A 1. With one or more of the required suppression chamber - drywell vacuum breakers inoperable for opening but known to be closed, restore at least nine vacuum breakers to OPERABLE status within 72 hours or be in at least

ACTION C HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION B 2. With one suppression chamber - drywell vacuum breaker open, restore the open vacuum breaker to the closed position within 4 hours or be in at least

ACTION C HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With one position indicator of any OPERABLE suppression chamber - drywell vacuum breaker inoperable, verify the vacuum breaker(s) with the inoperable position indicator to be closed by conducting a test which demonstrates that the ΔP is L.1

4.7 - SURVEILLANCE REQUIREMENTS

add proposed Note 1 to SR 3.6.1.8.1

E. Suppression Chamber - Drywell Vacuum Breakers

Each suppression chamber - drywell vacuum breaker shall be: A.2

add proposed Note 2 to SR 3.6.1.8.1

SR 3.6.1.8.1 1. Verified closed at least once per 7 days. 14 L.2

2. Demonstrated OPERABLE:

SR 3.6.1.8.2 a. At least once per 31 days and within 12 hours after any discharge of steam to the suppression chamber from one or more main steam relief valve(s), by cycling each vacuum breaker through at least one complete cycle of full travel.

b. At least once per 31 days by verifying both position indicator(s) OPERABLE by observing expected valve movement during the cycling test. L.1

c. At least once per ~~18~~ 24 months by: LD.1

SR 3.6.1.8.3 1) Verifying the force required to open the vacuum breaker, ~~from the closed position,~~ to be ≤0.5 psid, and LA.1

2) Verifying both position indicators OPERABLE by performance of a CHANNEL CALIBRATION. L.1

3) Verifying that each valve's position indicator is capable of detecting disk displacement of ≥0.0625 inches.

3.7 - LIMITING CONDITIONS FOR OPERATION

~~maintained at greater than or equal to 0.5 psi for one hour without makeup within 24 hours and at least once per 15 days thereafter. Otherwise be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.~~ L.1

4.7 - SURVEILLANCE REQUIREMENTS

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 A Note has been added to CTS 4.7.E.1, the Surveillance that verifies the vacuum breakers are closed. Note 2 to SR 3.6.1.8.1 has been added to clearly state that the vacuum breakers do not have to be closed when they are performing their intended function, which is to open to relieve vacuum. Since it is obvious that OPERABILITY is still being maintained, this addition is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 The allowance to enter CTS 3.7.E Action 1 with "one or more" of the required suppression chamber-to-drywell vacuum beakers inoperable for opening has been changed to only allow one required vacuum breaker to be inoperable (ITS 3.6.1.8 ACTION A). The Quad Cities 1 and 2 design includes a total of 12 vacuum breakers for each unit of which 8 must open to meet the safety analysis assumptions. Therefore, with one required vacuum breaker inoperable, the safety analysis can be met, however, the overall system reliability is reduced because a single failure in one of the remaining vacuum breakers could result in an excessive suppression chamber-to-drywell differential pressure during a DBA. This change is necessary to ensure the safety analysis can be met during the 72 hour outage time assuming no additional failures. In the ITS, if more than one required vacuum breaker is inoperable, a LCO 3.0.3 entry would be required.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The detail in CTS 4.7.E.2.c.1) that the opening setpoint is verified from the closed position is proposed to be relocated to the Bases. This detail is not necessary to ensure OPERABILITY of the suppression chamber-to-drywell vacuum breakers is maintained. The requirements of ITS 3.6.1.8 and SR 3.6.1.8.3 are adequate to ensure the suppression chamber-to-drywell vacuum breakers are maintained OPERABLE. Therefore, the relocated detail is not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

LD.1 The Frequency for performing CTS 4.7.E.2.c has been extended from 18 months to 24 months in proposed SR 3.6.1.8.3 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow this Surveillance to extend the Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

SR 3.6.1.6.3 verifies the opening setpoint of each suppression chamber-to-drywell vacuum breaker is less than or equal to the specified differential pressure. The 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. Furthermore other surveillances performed at shorter frequencies, such as a functional test of each vacuum breaker every 31 days and a requirement to verify each vacuum breaker is closed every 14 days, ensures the proper functioning status of each vacuum breaker.

Reviews of historical maintenance and surveillance data have shown that this test normally passes the Surveillance at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequency, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) does not invalidate any assumptions in the plant licensing basis.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

"Specific"

L.1 The vacuum breaker position indication instrumentation in CTS 3.7.E Action 3, CTS 4.7.E.2.b, and CTS 4.7.E.2.c.2) and 3) does not necessarily relate directly to the respective system OPERABILITY. The BWR ISTS, NUREG-1433 does not specify indication-only equipment to be OPERABLE to support OPERABILITY of a system or component. Control of the availability of, and necessary compensatory activities if not available, for indications and monitoring instruments are addressed by plant operational procedures and policies. Vacuum breaker position is required to be known to be able to satisfy the ITS 3.6.1.8 Surveillance Requirements (SR 3.6.1.8.1, SR 3.6.1.8.2, and SR 3.6.1.8.3) for the vacuum breakers. If position indication is not available and vacuum breaker position can not be determined, then the Surveillance Requirements cannot be satisfied and the appropriate actions must be taken for inoperable vacuum breakers in accordance with the ACTIONS of ITS 3.6.1.8. As a result, the requirements for the vacuum breaker position indication are adequately addressed by the requirements of ITS 3.6.1.8 and the associated SRs and are proposed to be deleted from Technical Specifications.

L.2 The Frequency for CTS 4.7.E.1, which requires verifying the vacuum breakers are closed, has been extended from 7 days to 14 days in proposed SR 3.6.1.8.1. For the position verification, most other safety-related valves, including those that affect primary containment, are verified once per 31 days. Therefore, based on this extended interval for similar requirements on component position Surveillances, and the fact that the valves are normally found in their correct position, the 14 day Frequency is considered adequate.

L.3 CTS 4.7.E requires the vacuum breakers be closed at all times; with no explicit allowance to be open when performing their intended function (i.e., when relieving vacuum), and no allowance to be open during performance of required Surveillances. ITS SR 3.6.1.8.1 Note 1 states that the vacuum breakers can be opened when performing required Surveillances. This addition provides specific ITS direction, which is consistent with the intent of maintaining "OPERABLE" vacuum breakers. This allowance will not affect the ability of the vacuum breaker to perform its intended function of relieving vacuum or of providing an isolated containment barrier in the event of positive drywell pressure. Therefore, this change introduces no negative impact on safety.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

K. Suppression Chamber

LCO 3.6.2.1 The suppression chamber shall be OPERABLE with:

1. The suppression pool water level between 14' 1" and 14' 5",

LCO 3.6.2.1.a 2. A suppression pool maximum average water temperature of ≤95°F during A.2 OPERATIONAL MODE(s) 1 or 2, except that the maximum average temperature may be permitted to increase to:

LCO 3.6.2.1.b a. ≤105°F during testing which adds heat to the suppression pool.

LCO 3.6.2.1.c b. ≤110°F with THERMAL POWER ≤1% of RATED A.2 THERMAL POWER.

CONDITION E c. ≤120°F with the main steam M.1 line isolation valves closed following a scram.

A.3 moved To ITS 3.6.1.1 3. A total leakage between the suppression chamber and drywell of less than the equivalent leakage through a 1 inch diameter orifice at a differential pressure of 1.0 psid.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

1. With the suppression pool water level outside the above limits, restore the water level to within the limits

See ITS 3.6.2.2

4.7 - SURVEILLANCE REQUIREMENTS

K. Suppression Chamber

The suppression chamber shall be demonstrated OPERABLE:

1. By verifying the suppression pool water level to be within the limits at least once per 24 hours.

SR 3.6.2.1.1 2. At least once per 24 hours by verifying the suppression pool average water temperature to be ≤95°F, except:

a. At least once per 5 minutes during testing which adds heat to the suppression pool, by verifying the suppression pool average water temperature to be ≤105°F.

b. At least once per hour when suppression pool average water temperature is ≥95°F, by verifying:

Required Action A.1 1) Suppression pool average water temperature to be ≤110°F, and

2) ~~THERMAL POWER to be ≤1% of RATED THERMAL POWER after suppression pool average water temperature has exceeded 95°F for more than 24 hours.~~ L.2

Required Action D.2 c. At least once per 30 minutes with the main steam line isolation valves closed following a scram M.1 and suppression pool average water temperature >95°F, L.2 by verifying suppression pool average water temperature to be ≤120°F.

3.7 - LIMITING CONDITIONS FOR OPERATION

within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION A — 2. In OPERATIONAL MODE(s) 1 or 2 with the suppression pool average water temperature >95°F, except as permitted above, restore the average temperature to ≤95°F within 24 hours

ACTION B — or reduce THERMAL POWER to ≤1% RATED THERMAL POWER within the next 12 hours.

3. ACTION C — With the suppression pool average water temperature >105°F during testing which adds heat to the suppression pool, except as permitted above, stop all testing which adds heat to the suppression pool and restore the

ACTION A — average temperature to ≤95°F within 24 hours or reduce THERMAL POWER

ACTION B — to ≤1% RATED THERMAL POWER within the next 12 hours.

See ITS 3.6.2.2

4. ACTION D — With the suppression pool average water temperature >110°F, immediately place the reactor mode switch in the Shutdown position ~~and operate at least one residual heat removal loop in the suppression pool cooling mode.~~

and be in MODE 4 in 36 hours.

L.1

5. ACTION E — With the suppression pool average water temperature >120°F, depressurize the reactor pressure vessel to <150 psig (reactor steam dome pressure) within 12 hours.

M.2

4.7 - SURVEILLANCE REQUIREMENTS

~~3. Deleted.~~

~~4. Deleted.~~

A.3 Moved to ITS 3.6.1.1

5. At least once per 18 months by conducting a drywell to suppression chamber bypass leak test at an initial differential pressure of 1.0 psid and verifying that the measured leakage is within the specified limit. If any drywell to suppression chamber bypass leak test fails to meet the specified limit, the test schedule for subsequent tests shall be reviewed and approved by the Commission. If two consecutive tests fail to meet the specified limit, a test shall be performed at least every 9 months until two consecutive tests meet the specified limit, at which time the 18 month test schedule may be resumed.

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 3.7.K.2 appears to require the 95°F and 105°F limits (shown in CTS 3.7.K.2 and CTS 3.7.K.2.a) to apply at all times in Operational Mode 1 or 2 (ITS MODE 1 or 2). However, these two limits actually only apply when THERMAL POWER is > 1% RTP. This is shown by CTS 3.7.K.2.b, which states that 110°F is the limit when ≤ 1% RTP. Therefore, the ITS LCO for these two limits has been clarified to be at > 1% RTP (ITS LCOs 3.6.2.1.a and b). When THERMAL POWER is ≤ 1% RTP, the LCO is met if suppression pool temperature is ≤ 110°F. Thus, a shutdown to MODE 3 and MODE 4 is not required as stated in CTS 3.0.B. As such, this change is considered a presentation preference, which is administrative.

A.3 The requirements (CTS 3.7.K.3 and CTS 4.7.K.5), relating to the drywell-to-suppression chamber bypass leakage limit, have been moved to ITS 3.6.1.1, in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to these requirements will be addressed in the Discussion of Changes for ITS: 3.6.1.1.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 3.7.K.2.c allows the suppression pool temperature to be increased to 120°F with the main steam isolation valves (MSIVs) closed following a scram. ITS 3.6.2.1 ACTION E, which requires reactor vessel depressurization to < 150 psig when pool temperature exceeds 120°F, does not depend upon if the MSIVs are open or closed. If pool temperature reaches 120°F, significant heat could still be added to the suppression pool regardless of MSIV position and the Required Action is appropriate. Applying the ACTIONS regardless of the status of the MSIVs does not introduce any operation that is not analyzed. In addition, the CTS 4.7.K.2.c condition that the 30 minute temperature verification after a scram is required only with the main steam line isolation valves closed has been

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 (cont'd) deleted, since the temperature verification, (as modified by Discussion of Change L.2 below) is now required at all times following a scram. These changes are more restrictive on plant operations. In addition, the requirement in CTS 3.7.K.2.c has been removed from the LCO and is now only in the ACTIONS. This is a human factors consideration.

M.2 The CTS Applicability for the 110°F limit (CTS 3.7.K.2.b) is MODES 1, 2, and 3 with THERMAL POWER $\leq$ 1% RTP. The CTS Applicability for the 120°F limit (CTS 3.7.K.2.c) is MODES 1, 2, and 3. However, the current ACTIONS for when temperature exceeds 110°F require scramming the reactor (CTS 3.7.K Action 4), and for when temperature exceeds 120°F only requires a depressurization to < 150 psig (CTS 3.7.K Action 5), both of which are still MODE 3. In ITS 3.6.2.1 ACTIONS D and E, when temperature exceeds 110°F or 120°F, the unit must also be placed in MODE 4 within 36 hours. This is consistent with the BWR ISTS, NUREG-1433, Rev. 1, and is an additional restriction on plant operation necessary to ensure the reactor is placed outside the MODES and specified conditions of Applicability when these suppression pool average temperature limitations are exceeded.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

None

"Specific"

L.1 The CTS 3.7.K Action 4 details of how to reduce suppression pool temperature to within the limits (by operating at least one residual heat removal loop in the suppression pool cooling mode) are to be removed from the Technical Specifications. Methods for reducing suppression pool temperature to within limits are part of a coordinated response to an unplanned event governed by plant procedures. This detail of how to reduce suppression pool temperature to within limits is not necessary to ensure restoration of suppression pool temperature in a timely manner. The Required Actions of Condition D of ITS 3.6.2.1 ensure the unit is placed in a non-applicable MODE if the suppression pool temperature is not reduced to within limits. In addition, with the unit in a non-applicable MODE, the requirements of ITS LCO 3.0.4 ensure that suppression pool temperature is reduced to within limits prior to entering an applicable MODE.

TECHNICAL CHANGES -LESS RESTRICTIVE (continued)

L.2 When suppression pool temperature is > 95°F and ≤ 110°F, and power is > 1% RTP, ITS LCO 3.6.2.1.a is not being met. ITS 3.6.2.1 Required Action A.1 requires verification of suppression pool temperature once per hour in this condition. In the event power is < 1% RTP, the LCO is being met (ITS LCO 3.6.2.1.c) and proposed SR 3.6.2.1.1 verification of temperature every 24 hours is sufficient. When power is ≤ 1% RTP, the plant is essentially shut down, which is the action required should suppression pool temperature increase to > 110°F. Knowledge of current power level is an inherent requirement for the operator at all times, and having a requirement to periodically document power level is unnecessary. Consequently, there is minimal significance to removing the 30 minute suppression pool verification when > 95°F but ≤ 110°F (in CTS 4.7.K.2.c and hourly power level verification (in CTS 4.7.K.2.b.2)) in those conditions.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

K. Suppression Chamber

LCO 3.6.2.2 The suppression chamber shall be OPERABLE with:

1. The suppression pool water level between 14' 1" and 14' 5",

2. A suppression pool maximum average water temperature of ≤95°F during OPERATIONAL MODE(s) 1 or 2, except that the maximum average temperature may be permitted to increase to:

   a. ≤105°F during testing which adds heat to the suppression pool.

   b. ≤110°F with THERMAL POWER ≤1% of RATED THERMAL POWER.

   c. ≤120°F with the main steam line isolation valves closed following a scram.

3. A total leakage between the suppression chamber and drywell of less than the equivalent leakage through a 1 inch diameter orifice at a differential pressure of 1.0 psid.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

ACTION A 1. With the suppression pool water level outside the above limits, restore the water level to within the limits

4.7 - SURVEILLANCE REQUIREMENTS

K. Suppression Chamber

The suppression chamber shall be demonstrated OPERABLE:

SR 3.6.2.2.1 1. By verifying the suppression pool water level to be within the limits at least once per 24 hours.

2. At least once per 24 hours by verifying the suppression pool average water temperature to be ≤95°F, except:

   a. At least once per 5 minutes during testing which adds heat to the suppression pool, by verifying the suppression pool average water temperature to be ≤105°F.

   b. At least once per hour when suppression pool average water temperature is ≥95°F, by verifying:

      1) Suppression pool average water temperature to be ≤110°F, and

      2) THERMAL POWER to be ≤1% of RATED THERMAL POWER after suppression pool average water temperature has exceeded 95°F for more than 24 hours.

   c. At least once per 30 minutes with the main steam line isolation valves closed following a scram and suppression pool average water temperature >95°F, by verifying suppression pool average water temperature to be ≤120°F.

<See ITS 3.6.2.1>

L.1

3.7 - LIMITING CONDITIONS FOR OPERATION

ACTION A 2

within ~~1~~ ~~hour~~ or be in at least HOT SHUTDOWN within the next 12 hours

ACTION B

and in COLD SHUTDOWN within the following 24 hours.

2. In OPERATIONAL MODE(s) 1 or 2 with the suppression pool average water temperature >95°F, except as permitted above, restore the average temperature to ≤95°F within 24 hours or reduce THERMAL POWER to ≤1% RATED THERMAL POWER within the next 12 hours.

3. With the suppression pool average water temperature >105°F during testing which adds heat to the suppression pool, except as permitted above, stop all testing which adds heat to the suppression pool and restore the average temperature to ≤95°F within 24 hours or reduce THERMAL POWER to ≤1% RATED THERMAL POWER within the next 12 hours.

4. With the suppression pool average water temperature >110°F, immediately place the reactor mode switch in the Shutdown position and operate at least one residual heat removal loop in the suppression pool cooling mode.

5. With the suppression pool average water temperature >120°F, depressurize the reactor pressure vessel to <150 psig (reactor steam dome pressure) within 12 hours.

<See ITS 3.6.2.1>

4.7 - SURVEILLANCE REQUIREMENTS

3. Deleted.

4. Deleted.

5. At least once per 18 months by conducting a drywell to suppression chamber bypass leak test at an initial differential pressure of 1.0 psid and verifying that the measured leakage is within the specified limit. If any drywell to suppression chamber bypass leak test fails to meet the specified limit, the test schedule for subsequent tests shall be reviewed and approved by the Commission. If two consecutive tests fail to meet the specified limit, a test shall be performed at least every 9 months until two consecutive tests meet the specified limit, at which time the 18 month test schedule may be resumed.

A.2 Moved to ITS 3.6.1.1

3.5 - LIMITING CONDITIONS FOR OPERATION

C. Suppression Chamber

The suppression chamber shall be OPERABLE:

LCO 3.6.2.2

1. In OPERATIONAL MODE(s) 1, 2, and 3 with a contained water volume equivalent to a water level of ≥14' 1" above the bottom of the suppression chamber LA.1

2. In OPERATIONAL MODE(s) 4 and 5[a] with a contained volume equivalent to a water level of ≥8.5' above the bottom of the suppression chamber, except that the suppression chamber level may be less than the limit provided that:

   a. No operations are performed that have a potential for draining the reactor vessel,

   b. The reactor mode switch is locked in the Shutdown or Refuel position,

   c. The condensate storage tank contains ≥140,000 available gallons of water, and

   d. The ECCS systems are OPERABLE per Specification 3.5.B.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2, 3, 4 and 5[a].

4.5 - SURVEILLANCE REQUIREMENTS

C. Suppression Chamber

SR 3.6.2.2.1 The suppression chamber shall be determined OPERABLE by verifying:

1. For OPERATIONAL MODE(s) 1, 2 and 3, at least once per 24 hours, the water level to be ≥14' 1".

2. For OPERATIONAL MODE(s) 4 or 5[a], at least once per 12 hours:

   a. The water level to be ≥8.5', or

   b. Verify the alternate conditions of Specification 3.5.C.2, or the conditions of footnote (a), to be satisfied.

A.3 Moved to ITS 3.5.2

a The suppression chamber is not required to be OPERABLE provided that the reactor vessel head is removed, the cavity is flooded or being flooded from the suppression pool, the spent fuel pool gates are removed when the cavity is flooded, and the water level is maintained within the limits of Specification 3.10.G and 3.10.H.

ACTION:

ACTION A

L.1 2

1. In OPERATIONAL MODE(s) 1, 2, or 3 with the suppression chamber water level less than the above limit, restore the water level to within the limit within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION B

2. In OPERATIONAL MODE(s) 4 or 5[a] with the suppression chamber water level less than the above limit or drained and the above required conditions not satisfied, suspend CORE ALTERATION(s) and all operations that have a potential for draining the reactor vessel and lock the reactor mode switch in the Shutdown position. Establish SECONDARY CONTAINMENT INTEGRITY within 8 hours.

A.3 moved to ITS 3.5.2

a The suppression chamber is not required to be OPERABLE provided that the reactor vessel head is removed, the cavity is flooded or being flooded from the suppression pool, the spent fuel pool gates are removed when the cavity is flooded, and the water level is maintained within the limits of Specification 3.10.G and 3.10.H.

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 4.7.K.5, relating to the drywell-to-suppression chamber bypass leakage limit, has been moved to ITS 3.6.1.1, in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to this requirement will be addressed in the Discussion of Changes for ITS: 3.6.1.1.

A.3 The CTS LCO 3.5.C.2, CTS 3.5.C Action 2, CTS 4.5.C.2 requirements, and footnote a, relating to the suppression pool level requirements while in MODES 4 and 5, have been moved to ITS 3.5.2, "ECCS — Shutdown," in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to these requirements will be addressed in the Discussion of Changes for ITS: 3.5.2.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The details relating to suppression chamber OPERABILITY in CTS 3.5.C.2 (reference for suppression chamber level) are proposed to be relocated to the Bases. ITS 3.6.2.2 will continued to require the suppression chamber level to be maintained. The details for system OPERABILITY are not necessary in the LCO. The definition of OPERABILITY suffices. As such, the relocated details are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Proram described in Chapter 5 of the ITS.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Specific"

L.1 CTS 3.7.K Action 1 and CTS 3.5.C Action 1 allow 1 hour to restore level when the suppression pool water level is outside the limits. An unanticipated change in suppression pool level would require addressing the cause and aligning the appropriate system to raise or lower the pool level. These activities may require longer than 1 hour to accomplish. ITS 3.6.2.2 Required Action A.1 will allow 2 hours to restore the suppression pool water level to within limits. The proposed out of service time is based on engineering judgement of the relative risks associated with: 1) the safety significance of the system; 2) the probability of an event requiring the safety function of the system; and 3) the relative risks associated with the plant transient and potential challenge of safety systems experienced by requiring a plant shutdown.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

M. Suppression Pool Cooling

LCO 3.6.2.3 The suppression pool cooling function of the residual heat removal (RHR) system shall be OPERABLE with two independent subsystems, each subsystem consisting of:

LA.1

1. One OPERABLE RHR pump, and
2. An OPERABLE flow path capable of recirculating water from the suppression pool through a heat exchanger.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

1. ACTION A — With one suppression pool cooling subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days or ACTION C — be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
2. ACTION B — With both suppression pool cooling subsystems inoperable, be in at least ACTION C — HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN[a] within the next 24 hours.

L.1

restore one subsystem to OPERABLE status within 8 hours

A.2

4.7 - SURVEILLANCE REQUIREMENTS

M. Suppression Pool Cooling

The suppression pool cooling function of the RHR system shall be demonstrated OPERABLE:

1. SR 3.6.2.3.1 At least once per 31 days by verifying that each valve, manual, power operated or automatic, in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position. or can be aligned to the correct position A.3
2. SR 3.6.2.3.2 By verifying that each of the required RHR pumps develops the required recirculation flow through the heat exchanger and the suppression pool when tested pursuant to Specification 4.0.E.

≥ 5000 gpm M.1

---

a . Whenever the two required RHR/SDC mode subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

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ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The CTS 3.7.M Action 2, footnote a requirement that if unable to attain Cold Shutdown when the two RHR subsystems are inoperable, then maintain reactor coolant temperature as low as practical by use of alternate heat removal methods is deleted since it provides unnecessary duplication of the ACTIONS, contains no additional restrictions on the operation of the plant, and in fact, could be interpreted as a relaxation of the requirements to achieve MODE 4. The Action to be in MODE 4, which is modified by the footnote, adequately prescribes the requirement to make efforts to "maintain reactor coolant temperature as low as practical" (i.e., the duplicative requirement of the footnote). If conditions are such that MODE 4 cannot be attained, the Action remains in effect, essentially requiring efforts to reach MODE 4 to continue. Elimination of the footnote reflects an administrative presentation preference.

A.3 CTS 4.7.M.1 requires verification that each suppression pool cooling valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position. The suppression pool cooling function is manually actuated (requiring reposition of valves and starting of the RHR pump by the operator). In the CTS, this is recognized and interpreted that "in the correct position" allows the valves to be in a non-accident position provided they can be realigned to the correct position. In the ITS, the words "in the correct position" mean that the valves must be in the accident position, unless they can be automatically aligned on an accident signal. If so, then they can be in the non-accident position. Thus, for RHR suppression pool cooling, the additional words "or can be aligned to the correct position" have been added to clarify that it is permissible for this systems' valves to be in the non-accident position and still be considered OPERABLE. In addition, since there are no automatic valves for the suppression pool cooling mode, the reference to check automatic valves has been deleted. Since these are the current requirements, these changes are considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 A specific value has been added to CTS 4.7.M.2 (proposed SR 3.6.2.3.2) for verification of the required RHR pump flow when in the suppression pool cooling mode. This SR confirms component OPERABILITY to ensure primary containment peak pressure and temperature can be maintained below the design limits during a DBA. This change to include the specific flow value within the ITS is more restrictive on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The details relating to system OPERABILITY in CTS 3.7.M (in this case the suppression pool cooling function is designated as two "independent" subsystems, each with a pump and flow path) are proposed to be relocated to the Bases. These details for system OPERABILITY are not necessary in the LCO. The definition of OPERABILITY suffices. Therefore, the relocated details are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

"Specific"

L.1 A restoration time when both suppression pool cooling subsystems are inoperable has been provided in ITS 3.6.2.3 ACTION B. Currently, no time is provided; CTS 3.7.M Action 2 requires a unit shutdown. The proposed 8 hour Completion Time is consistent with the current time provided when both drywell spray subsystems or both suppression pool spray subsystems are inoperable (CTS 3.7.L). The time is considered appropriate since an immediate shutdown has the potential for resulting in a unit scram and discharge of steam to the suppression pool, when both suppression pool cooling subsystems are inoperable and incapable of removing the generated heat. The 8 hours provides some time to restore one of the subsystems prior to requiring a shutdown (thus precluding the potential problem described above), yet is short enough that it does not significantly increase the probability of an accident to occur during this additional time.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

L. Suppression Chamber ~~and Drywell~~ Spray

LCO 3.6.2.4 The suppression chamber ~~and drywell~~ spray functions of the residual heat removal (RHR) system shall be OPERABLE with two ~~independent~~ subsystems, ~~each subsystem consisting of:~~

~~1. One OPERABLE RHR pump, and~~

~~2. An OPERABLE flow path capable of recirculating water from the suppression pool through a heat exchanger and the suppression chamber and drywell spray nozzles.~~

LA.1

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2 and 3.

ACTION:

ACTION A — 1. With one suppression chamber/drywell spray subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days,

ACTION C — or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION B — 2. With both suppression chamber/drywell spray subsystems inoperable, restore at least one subsystem to OPERABLE status within 8 hours,

ACTION C — or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN[a] within the next 24 hours.

A.2

4.7 - SURVEILLANCE REQUIREMENTS

L. Suppression Chamber ~~and Drywell~~ Spray

The suppression chamber ~~and drywell~~ spray functions of the RHR system shall be demonstrated OPERABLE:

SR 3.6.2.4.1 1. At least once per 31 days by verifying that each valve, manual, power operated ~~or automatic~~ in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position, or can be aligned to the correct position A.3

~~2. By performance of an air or smoke flow test of the drywell spray nozzles at least once per 5 years and verifying that each spray nozzle is unobstructed.~~

R.1

Add proposed SR 3.6.2.4.2

M.1

~~a Whenever the two required RHR SDC mode subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.~~

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The CTS 3.7.L Action 2, footnote a requirement that if unable to attain Cold Shutdown when the two required RHR SDC subsystems are inoperable, then maintain reactor coolant temperature as low as practical by use of alternate heat removal methods is deleted since it provides unnecessary duplication of the ACTIONS, contains no additional restrictions on the operation of the plant, and in fact, could be interpreted as a relaxation of the requirements to achieve MODE 4. The Action to be in MODE 4, which is modified by the footnote, adequately prescribes the requirement to make efforts to "maintain reactor coolant temperature as low as practical" (i.e., the duplicative requirement of the footnote). If conditions are such that MODE 4 cannot be attained, the Action remains in effect, essentially requiring efforts to reach MODE 4 to continue. Elimination of the footnote reflects an administrative presentation preference.

A.3 CTS 4.7.L.1 requires verification that each suppression pool spray valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position. The suppression pool spray function is manually actuated (requiring reposition of valves and starting of the RHR pump by the operator). In the CTS, this is recognized and interpreted that "in the correct position" allows the valves to be in a non-accident position provided they can be realigned to the correct position. In the ITS, the words "in the correct position" mean that the valves must be in the accident position, unless they can be automatically aligned on an accident signal. If so, then they can be in the non-accident position. Thus, for RHR suppression pool spray the additional words "or can be aligned to the correct position" have been added in proposed SR 3.6.2.4.1 to clarify that it is permissible for this systems' valves to be in the non-accident position and still be considered OPERABLE. In addition, since there are no automatic valves for the suppression pool spray mode, the reference to check automatic valves has been deleted. Since these are the current requirements, these changes are considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 A new Surveillance Requirement has been added. This Surveillance Requirement (SR 3.6.2.4.2) verifies each suppression pool spray nozzle is unobstructed every 5 years. This SR is required to ensure that when a suppression pool spray subsystem is required per its design function that it will perform as designed. This SR is an additional restriction on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The details in the CTS 3.7.L LCO relating to system OPERABILITY (in this case the suppression pool spray function shall have two "independent" subsystems, each with a pump and flow path) is proposed to be relocated to the Bases. These details for system OPERABILITY are not necessary in the LCO. The definition of OPERABILITY suffices. Therefore, the relocated details are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

"Specific"

None

RELOCATED SPECIFICATIONS

R.1 The requirement for drywell spray will be relocated to the Technical Requirements Manual (TRM). The drywell spray is not credited in DBA (i.e., it is not needed to function to mitigate the consequences of any design basis accidents). While it is assumed to be utilized in the emergency operating procedures, it has been determined to be non-risk significant. Therefore, the requirements specified for the drywell spray in CTS 3/4.7.L did not satisfy the NRC Policy Statement Technical Specification screening criteria as documented in the Application of Selection Criteria to the Quad Cities 1 and 2 Technical Specifications and will be relocated to the TRM, which is controlled in accordance with 10 CFR 50.59.

3.7 - LIMITING CONDITIONS FOR OPERATION

H. Drywell - Suppression Chamber Differential Pressure

LCO 3.6.2.5

Differential pressure between the drywell and the suppression chamber shall be ≥1.0 psid[a].

APPLICABILITY:

OPERATIONAL MODE 1, during the time period:

1. Beginning within 24 hours after THERMAL POWER is >15% of RATED THERMAL POWER following startup, and
2. Ending within 24 hours prior to reducing THERMAL POWER to ≤15% of RATED THERMAL POWER preliminary to a scheduled reactor shutdown.

M.1

ACTION:

ACTION A

1. With the drywell - suppression chamber differential pressure less than the above limit, restore the required differential pressure within 24 hours or

ACTION B

reduce THERMAL POWER to <15% RATED THERMAL POWER within the next 8 hours.

≤ A.2

2. ~~With the drywell - suppression chamber differential pressure instrumentation CHANNEL inoperable, restore the inoperable CHANNEL to OPERABLE status within 30 days or reduce THERMAL POWER to <15% RATED THERMAL POWER within the next 8 hours.~~

L.1

4.7 - SURVEILLANCE REQUIREMENTS

H. Drywell - Suppression Chamber Differential Pressure

1. The drywell - suppression chamber differential pressure shall be demonstrated to be within limits by verifying the differential pressure at least once per 12 hours.

SR 3.6.2.5.1

2. ~~At least one drywell - suppression chamber differential pressure instrumentation CHANNEL, and at least one drywell pressure and one suppression chamber pressure instrumentation CHANNEL shall be demonstrated OPERABLE by performance of a:~~
   a. ~~CHANNEL CHECK at least once per 24 hours,~~
   b. ~~CHANNEL CALIBRATION at least once per 6 months.~~

L.1

LA.1

Note LCO 3.6.2.5

a Except for up to 4 hours for required surveillance ~~which reduces the differential pressure~~.

3.7 - LIMITING CONDITIONS FOR OPERATION

4.7 - SURVEILLANCE REQUIREMENTS

3. ~~With the drywell and/or suppression chamber pressure instrumentation CHANNEL(s) inoperable, restore the inoperable CHANNEL(s) to OPERABLE status within 30 days or reduce THERMAL POWER to <15% RATED THERMAL POWER within the next 8 hours.~~

4. ~~With the drywell - suppression chamber differential pressure instrumentation CHANNEL inoperable and with insufficient drywell and suppression chamber pressure instrumentation CHANNEL(s) OPERABLE to determine drywell - suppression chamber differential pressure, restore either the drywell - suppression chamber differential pressure instrumentation CHANNEL or sufficient drywell and suppression chamber pressure instrumentation CHANNEL(s) to determine drywell - suppression chamber differential pressure to OPERABLE status within 8 hours or reduce THERMAL POWER to <15% RATED THERMAL POWER within the next 8 hours.~~

L.1

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 CTS 3.7.H Action 1 for failing to meet the LCO requires reactor power to be reduced to $<15\%$ RTP within 8 hours. ITS 3.6.2.5 ACTION B revises the CTS Action to require the power to be reduced to $\leq 15\%$ RTP. The CTS 3.7.H Applicability is $> 15\%$ RTP. The CTS 3.7.H and ITS 3.6.2.5 Actions should specify a MODE or other conditions in which the LCO does not apply. To achieve this, power should be reduced to $\leq 15\%$ RTP. At 15% RTP, the Applicability is exited and the Actions are no longer required (in accordance with CTS 3.0.A and 3.0.B and ITS LCO 3.0.1 and 3.0.2). Since the CTS 3.7.H Action can also be suspended at 15% RTP for the same reason, the change is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 The Applicability for CTS 3.7.H ends 24 hours prior to reducing THERMAL POWER to $\leq 15\%$ RTP preliminary to a scheduled reactor shutdown. The Applicability for ITS 3.6.2.5 will end 24 hours prior to reducing THERMAL POWER to $< 15\%$ RTP prior to the next scheduled reactor shutdown. Thus, the Applicability for ITS 3.6.2.5 lasts slightly longer than the current Applicability (since $< 15\%$ RTP is reached slightly after $\leq 15\%$ RTP is reached). This change has been made to be consistent with the BWR ISTS, NUREG-1433, Rev. 1, and is more restrictive on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The details in CTS 3.7.H footnote (a) which defines the types of required Surveillances ("which reduces the differential pressure") where the drywell-to-suppression chamber differential pressure can be outside of limits for 4 hours is proposed to be relocated to the Bases. The requirement in the LCO 3.6.2.5 Note which specifies that the LCO is not required to be met for up to 4 hours during performance of required Surveillances and the detail in the Bases which describes the purpose of the Note are adequate to ensure the current requirement is being met. As a result, this detail is not necessary to be included in the Technical Specifications to ensure the drywell-to-suppression chamber differential pressure is only exceeded during required Surveillances that reduce differential pressure. As such, the relocated detail is not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

"Specific"

L.1 The drywell-suppression chamber differential pressure instrumentation specified in CTS 3.7.H Actions 2, 3, and 4 and CTS 4.7.H.2 does not necessarily relate directly to the OPERABILITY of the system. The BWR ISTS, NUREG-1433, does not specify indication-only equipment to be OPERABLE to support OPERABILITY of a system or component. Control of the availability of, and necessary compensatory activities if not available, for indications and monitoring instrumentations are addressed by plant operational procedures and policies. Drywell-suppression chamber differential pressure instrumentation is required to be OPERABLE to satisfy the drywell-to-suppression chamber differential pressure verification Surveillance Requirement (proposed SR 3.6.2.5.1). If the drywell-suppression chamber differential pressure instrumentation is inoperable, then the Surveillance Requirement cannot be satisfied and the appropriate actions must be taken for drywell-to-suppression chamber differential pressure not within limit in accordance with the ACTIONS of ITS 3.6.2.5. As a result, the requirements for the drywell-to-suppression chamber differential pressure instrumentation are adequately addressed by the requirements of ITS 3.6.2.5 and SR 3.6.2.5.1 and are proposed to be deleted from Technical Specifications.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

J. Primary Containment Oxygen Concentration

LCO 3.6.3.1 The suppression chamber and drywell atmosphere oxygen concentration shall be <4% by volume.

APPLICABILITY:

OPERATIONAL MODE 1, during the time period:

1. Beginning within 24 hours after THERMAL POWER is >15% of RATED THERMAL POWER following startup, and

2. Ending within 24 hours prior to reducing THERMAL POWER to <15% of RATED THERMAL POWER preliminary to a scheduled reactor shutdown.

ACTION:

ACTION A — With the drywell and/or suppression chamber oxygen concentration exceeding the limit, restore the oxygen concentration to within the limit within 24 hours ~~or~~

ACTION B — reduce THERMAL POWER to ~~<~~ ≤ 15% RATED THERMAL POWER within the next 8 hours.

A.2

4.7 - SURVEILLANCE REQUIREMENTS

J. Primary Containment Oxygen Concentration

SR 3.6.3.1.1 The suppression chamber and drywell oxygen concentration shall be verified to be within the limit ~~within 24 hours after THERMAL POWER is >15% of RATED THERMAL POWER and~~ at least once per 7 days thereafter. A.3

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The CTS 3.7.J Action for failing to meet the LCO requires reactor power to be reduced to < 15% RTP within 8 hours. ITS 3.6.3.1 ACTION B revises the CTS Action to require the power to be reduced to ≤ 15% RTP. The CTS 3.7.J and ITS 3.6.3.1 Actions should specify a MODE or other conditions in which the LCO does not apply. To achieve this, power should be reduced to ≤ 15% RTP. Below 15% RTP, the Applicability is exited and the Actions are no longer required (in accordance with CTS 3.0.A and 3.0.B and ITS LCO 3.0.1 and 3.0.2). Since the CTS 3.7.J Action can also be suspended at 15% RTP for the same reason, the change is considered administrative.

A.3 CTS 4.7.J requires oxygen concentration in primary containment to be verified within limit prior to entering the Applicability of CTS 3.7.J.1 (within 24 hours after THERMAL POWER is greater than 15% of RTP). This redundant requirement is deleted. CTS 4.0.D and ITS SR 3.0.4 require surveillances to be performed prior to entering the Applicability of an LCO. Therefore, this requirement does not need to be repeated as a separate Surveillance Frequency and its deletion is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

None

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

N. SECONDARY CONTAINMENT INTEGRITY

LCO 3.6.4.1 SECONDARY CONTAINMENT ~~INTEGRITY~~ shall be ~~maintained~~ OPERABLE. A.2

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2, 3 and *.

ACTION:

ACTION A — A2
1. Without SECONDARY CONTAINMENT OPERABLE ~~INTEGRITY~~ in OPERATIONAL MODES(s) 1, 2 or 3, restore SECONDARY CONTAINMENT to OPERABLE status ~~INTEGRITY~~ within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. (ACTION B)

ACTION C — A2
2. Without SECONDARY CONTAINMENT OPERABLE ~~INTEGRITY~~ in OPERATIONAL MODE *, suspend handling of irradiated fuel in the secondary containment, CORE ALTERATION(s), and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.C are not applicable.

4.7 - SURVEILLANCE REQUIREMENTS

N. SECONDARY CONTAINMENT INTEGRITY

SECONDARY CONTAINMENT ~~INTEGRITY~~ shall be demonstrated OPERABLE by: A.2

SR 3.6.4.1.1 1. Verifying at least once per 24 hours that the pressure within the secondary containment is ≥0.10 inches of vacuum water gauge.

2. Verifying at least once per 31 days that:

SR 3.6.4.1.2 a. At least one door in each secondary containment air lock is closed. A.3

b. All secondary containment penetrations[a] not capable of being closed by OPERABLE secondary containment automatic isolation dampers and required to be closed during accident conditions are closed. Moved to ITS 3.6.4.2 A.4 LD.1

SR 3.6.4.1.3 3. At least once per ~~18~~ 24 months on a STAGGERED TEST BASES by operating one standby gas treatment subsystem at a flow rate ≤4000 cfm for one hour and maintaining ≥0.25 inches of vacuum water gauge in the secondary containment. M.1

APPLICABILITY
* When handling irradiated fuel in the secondary containment, during CORE ALTERATION(s), and operations with a potential for draining the reactor vessel.

a Valves and blind flanges in high-radiation areas may be verified by use of administrative controls. Normally locked or sealed-closed penetrations may be opened intermittently under administrative control. Moved to ITS 3.6.4.2 A.4

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The definition of SECONDARY CONTAINMENT INTEGRITY in CTS 1.0 has not been included in the ITS. This was done because of the confusion associated with these definitions compared to its use in the respective LCO. Therefore, the references in CTS 3/4.7.N to SECONDARY CONTAINMENT INTEGRITY are replaced with the requirement for secondary containment to be OPERABLE. The change is editorial in that all the requirements of CTS 3/4.7.N are specifically addressed in the ITS and associated Bases for the Secondary Containment (3.6.4.1), the Secondary Containment Isolation Valves (3.6.4.2), and Standby Gas Treatment System (3.6.4.3). Therefore, the change is a presentation preference adopted by the BWR ISTS, NUREG-1433, Rev. 1.

A.3 The CTS 4.7.N.2.a requirement to verify that one door in each secondary containment air lock is closed has been modified to require one door in each access opening to be closed in proposed SR 3.6.4.1.2. The Quad Cities 1 and 2 design includes more than two doors on some of the accesses. The current Quad Cities 1 and 2 interpretation of this requirement is that for these accesses, there are multiple access openings, and each access opening must have one door closed. Therefore, this change is a clarification of current practice, and as such, is administrative in nature.

A.4 CTS 4.7.N.2.b, including footnote a, relating to the position of secondary containment isolation valves, has been moved to ITS 3.6.4.2, "Secondary Containment Isolation Valves," in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to this requirement will be discussed in the Discussion of Changes for ITS: 3.6.4.2.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 4.7.N.3 requires that one subsystem be tested every 18 months. However, the same SGT subsystem could be tested at each testing occurrence. Proposed SR 3.6.4.1.3 will now require both subsystems be tested in the course of 48 months, as represented by the Staggered Test Basis requirement of the 24 month Frequency. This will ensure each SGT subsystem can maintain the proper vacuum. This is an additional restriction on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LD.1 The Frequency for performing CTS 4.7.N.3 has been extended from 18 months to 24 months in proposed SR 3.6.4.1.3 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. This surveillance ensures that the Secondary Containment is OPERABLE. The proposed change will allow this Surveillance to extend the Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

CTS 4.7.N.3 (ITS SR 3.6.4.1.3) verifies the secondary containment can be maintained at the required vacuum. The purpose of this test is to ensure secondary containment boundary integrity by demonstrating that secondary containment vacuum assumed in the safety analysis can be maintained under design basis conditions. Extending the surveillance interval for this verification of secondary containment integrity is acceptable because secondary containment is maintained at a negative pressure during normal operation, and secondary containment structural integrity is maintained through administrative controls which ensure that no significant changes will be made to the secondary containment structure without proper evaluation. Furthermore, based on engineering judgement, any structural degradation which would result in impacting secondary containment OPERABILITY is not likely to occur during normal plant operation. Any event which would cause significant structural degradation, such as a seismic event would require a plant evaluation.

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) Reviews of historical maintenance and surveillance data have shown that these tests normally pass their Surveillances at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequencies, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) do not invalidate any assumptions in the plant licensing basis.

"Specific"

None

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

LCO 3.6.4.2 O. Secondary Containment ~~Automatic~~ Isolation ~~Dampers~~ Valves A.2

Each secondary containment ~~ventilation system automatic~~ isolation ~~damper~~ valve shall be OPERABLE.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2, 3 and *.

add proposed Note 1 to ACTIONS L.1

add proposed Notes 2 and 3 to ACTIONS A.3

ACTION:

ACTION A

With one or more of the secondary containment ~~ventilation system automatic~~ isolation ~~dampers~~ valves inoperable, ~~maintain at least one isolation damper OPERABLE in each affected penetration that is open and~~ within 8 hours either: A.2 A.4

~~1. Restore the inoperable damper(s) to OPERABLE status, or~~ A.5

2. Isolate each affected penetration by use of at least one deactivated automatic ~~damper~~ valve secured in the isolation position, or A.2

3. Isolate each affected penetration by use of at least one closed manual valve or blind flange.

add proposed ACTION B L.2

ACTION C Otherwise, in OPERATIONAL MODE(s) 1, 2 or 3, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION D Otherwise, in OPERATIONAL MODE *, suspend handling of irradiated fuel in the secondary containment, CORE

4.7 - SURVEILLANCE REQUIREMENTS

O. Secondary Containment ~~Automatic~~ Isolation ~~Dampers~~ Valves A.2

Each secondary containment ~~ventilation system~~ automatic isolation ~~damper~~ valve shall be demonstrated OPERABLE:

~~1. Prior to returning the damper to service after maintenance, repair, or replacement work is performed on the valve or its associated actuator, control, or power circuit by performance of a cycling test.~~ L.3

SR 3.6.4.2.3 2. At least once per ~~18~~ 24 months by verifying that on an actual or isolation test signal each automatic isolation ~~damper~~ valve actuates to its isolation position. LD.1 L.4 A.2

add proposed SR 3.6.4.2.2 M.1

Applicability * When handling irradiated fuel in the secondary containment, during CORE ALTERATION(s), and operations with a potential for draining the reactor vessel.

3.7 - LIMITING CONDITIONS FOR OPERATION	4.7 - SURVEILLANCE REQUIREMENTS
ACTION D ALTERATION(s), and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.C are not applicable.	

3.7 - LIMITING CONDITIONS FOR OPERATION

N. SECONDARY CONTAINMENT INTEGRITY

SECONDARY CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2, 3 and *.

ACTION:

1. Without SECONDARY CONTAINMENT INTEGRITY in OPERATIONAL MODES(s) 1, 2 or 3, restore SECONDARY CONTAINMENT INTEGRITY within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. Without SECONDARY CONTAINMENT INTEGRITY in OPERATIONAL MODE *, suspend handling of irradiated fuel in the secondary containment, CORE ALTERATION(s), and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.C are not applicable.

4.7 - SURVEILLANCE REQUIREMENTS

N. SECONDARY CONTAINMENT INTEGRITY

SECONDARY CONTAINMENT INTEGRITY shall be demonstrated by:

1. Verifying at least once per 24 hours that the pressure within the secondary containment is ≥0.10 inches of vacuum water gauge.

2. Verifying at least once per 31 days that:

   a. At least one door in each secondary containment air lock is closed.

   Required Action A.2 and SR 3.6.4.2.1

   b. All secondary containment penetrations[a] not capable of being closed by OPERABLE secondary containment automatic isolation ~~dampers~~ valves and required to be closed during accident conditions are closed. A.2

   and not locked, sealed, or otherwise secured L.5

3. At least once per 18 months by operating one standby gas treatment subsystem at a flow rate ≤4000 cfm for one hour and maintaining ≥0.25 inches of vacuum water gauge in the secondary containment.

<See ITS 3.6.4.1>

Required Action A2 Note: * When handling irradiated fuel in the secondary containment, during CORE ALTERATION(s), and operations with a potential for draining the reactor vessel.

SR 3.6.4.2.1 Note 1: a Valves and blind flanges in high-radiation areas may be verified by use of administrative controls. SR 3.6.4.2.1 Note 2: Normally locked or sealed-closed penetrations may be opened intermittently under administrative control. L.1

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The name and descriptive references to the secondary containment isolation dampers contained in CTS 3.7.O, 4.7.N, and 4.7.O have been generically changed to Secondary Containment Isolation Valves (SCIVs). This change is considered editorial in that the intent of the affected CTS LCO, Actions and Surveillance Requirements are not altered. Therefore, this change is a presentation preference adopted by the BWR ISTS, NUREG-1433, Rev. 1, and as such, is administrative in nature.

A.3 ITS 3.6.4.2 ACTIONS Note 2 ("Separate Condition entry is allowed for each penetration flow path") provides explicit instructions for proper application of the ACTIONS for Technical Specification compliance. In conjunction with the proposed Specification 1.3, "Completion Times," this ACTIONS Note provides direction consistent with the intent of the existing ACTIONS for inoperable isolation valves. It is intended that each inoperable penetration flow path is allowed a certain time to complete the Required Actions. Since this change only provides more explicit direction of the current interpretation of the existing specification, this change is considered administrative. Similarly, ITS 3.6.4.2 ACTIONS Note 3 facilitates the use and understanding of the intent to consider the affect of inoperable isolation valves on other systems. For a system made inoperable by inoperable SCIVs the applicable ACTIONS for that system also apply. With ITS LCO 3.0.6, this intent would not necessarily apply. This clarification is consistent with the intent and interpretation of the existing Technical Specifications, and is therefore considered administrative.

A.4 The CTS 3.7.O Action does not specify penetrations with one or two isolation valves. However, ITS 3.6.4.2 Condition A only applies if one valve in a penetration is inoperable. This inherently ensures maintaining "at least one isolation valve OPERABLE." This change is a presentation preference and is administrative in nature.

A.5 The revised presentation of the CTS 3.7.O Action (based on the BWR ISTS, NUREG-1433, Rev. 1) does not explicitly detail options to "restore...to OPERABLE status." This action is always an option, and is implied in all Actions. Omitting this action from the ITS is editorial.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 ITS SR 3.6.4.2.2 has been added to the secondary containment isolation damper Surveillance Requirements specified in CTS 4.7.O. ITS SR 3.6.4.2.2 requires the isolation time of each power operated, automatic SCIV to be verified within limits. The satisfactory completion of this SR provides assurance that the secondary containment isolation valves will function and the secondary containment will perform as assumed in the safety analyses. The proposed Frequency of ITS SR 3.6.4.2.2 is 92 days, which is consistent with the Frequency for the stroke time testing requirements of the Inservice Testing Program. This Frequency is also consistent with the isolation time verification requirements for power operated, automatic PCIVs (ITS SR 3.6.1.3.5 and CTS 4.7.D.3). The addition of this new SR and its performance in accordance with the proposed Frequency is a restriction on plant operation.

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LD.1 The Frequency for performing CTS 4.7.O.2 has been extended from 18 months to 24 months in proposed SR 3.6.4.2.3 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow this Surveillance to extend the Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

SR 3.6.4.2.3 verifies each automatic secondary containment isolation valve (SCIV) actuates to the isolation position on an actual or simulated automatic isolation signal. This is required to prevent leakage of radioactive material from secondary containment following a DBA or other accidents. Extending the Surveillance interval for this verification is acceptable in part because the valves are operated more frequently every 92 days to satisfy the requirements of SR 3.6.4.2.2, which verifies isolation times are within limits. These tests will detect significant failures affecting valve operation that would be detected by conducting the 24 month surveillance test. In addition, the Secondary

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) Containment Isolation system active components and power supplies are designed with redundancy to meet the single active failure criteria, which will ensure system availability in the event of a failure of one of the system components. Also the actual or simulated isolation signal overlaps Logic System Functional Testing performed in SR 3.3.6.2.4 of Secondary Containment Isolation Instrumentation. As stated in the NRC Safety Evaluation Report (dated August 2, 1993) relating to extension of the Peach Bottom Atomic Power Station, Unit Numbers 2 and 3 surveillance intervals from 18 to 24 months:

> "Industry reliability studies for boiling water reactors (BWRs), prepared by the BWR Owners Group (NEDC-30936P) show that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic system, but by that of the mechanical components, (e.g., pumps and valves), which are consequently tested on a more frequent basis. Since the probability of a relay or contact failure is small relative to the probability of mechanical component failure, increasing the Logic System Functional Test interval represents no significant change in the overall safety system unavailability."

Based on the redundancy and the above discussion, it is concluded that the impact, if any, on system availability is minimal as a result of the change to the SCIV test intervals.

Reviews of historical maintenance and surveillance data have shown that this test normally passes the Surveillance at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequency, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) does not invalidate any assumptions in the plant licensing basis.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

"Specific"

L.1 An allowance is proposed for intermittently opening closed secondary containment isolation valves under administrative control, other than those currently allowed to be opened using CTS 4.7.N, footnote a (locked or sealed-closed penetrations). This is equivalent to the allowance in the existing primary containment Technical Specifications for locked or sealed-closed valves (CTS 3.7.D) and in ITS 3.6.1.3. The administrative controls consist of stationing a dedicated operator, who is in continuous communication with the control room, at the controls of the isolation device. The allowance is presented in ITS 3.6.4.2 ACTIONS Note 1 and SR 3.6.4.2.1 Note 2. Opening of secondary containment penetrations on a intermittent basis is required for many of the same reasons as primary containment penetrations and the potential impact on consequences is less significant. The proposed allowance is acceptable due to the low probability of an event that would release radioactivity in the secondary containment during the short time in which the SCIV is open and the administrative controls established to ensure the affected penetration can be isolated when a need for secondary containment isolation is indicated.

L.2 In the event both valves in a penetration are inoperable in an open penetration, the CTS 3.7.O Action, which requires maintaining one isolation valve OPERABLE, would not be met and an immediate shutdown would be required. ITS 3.6.4.2 ACTION B provides 4 hours prior to commencing a required shutdown. This proposed 4 hour period is consistent with the existing time allowed for conditions when the secondary containment is inoperable. The proposed change will provide consistency in ACTIONS for these various secondary containment degradations. This change to CTS 3.7.O is acceptable due to the low probability of an event requiring the secondary containment during the short time in which continued operation is allowed and the capability to isolate a secondary containment penetration is lost.

L.3 CTS 4.7.O.1 is proposed to be deleted. Any time the OPERABILITY of a system or component has been affected by repair, maintenance, or replacement of a component, post maintenance testing is required to demonstrate OPERABILITY of the system or component. After restoration of a component that caused a required SR to be failed, ITS SR 3.0.1 requires the appropriate SRs (in this case SR 3.6.4.2.2) to be performed to demonstrate the OPERABILITY of the affected components. Therefore, explicit post maintenance Surveillance Requirements in CTS 4.7.O.1 are not required and have been deleted from the Technical Specifications.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.4 The phrase "actual or," in reference to the isolation test signal in CTS 4.7.O.2, has been added to proposed SR 3.6.4.2.3, which verifies that each SCIV actuates on an automatic isolation signal. This allows satisfactory automatic SCIV isolations for other than Surveillance purposes to be used to fulfill the Surveillance Requirement. Operability is adequately demonstrated in either case since the SCIV itself cannot discriminate between "actual" or "test" signals.

L.5 The requirements of CTS 4.7.N.2.b, related to verification of the position of secondary containment isolation penetrations not capable of being closed by OPERABLE secondary containment isolation valves (SCIVs), are revised in proposed SR 3.6.4.2.1 and ITS 3.6.4.2 Required Action A.2 (Note 2) to exclude verification of manual valves and blind flanges that are locked, sealed, or otherwise secured in the correct position. The purpose of CTS 4.7.N.2.b is to ensure that manual secondary containment isolation devices that may be misaligned are in correct position to help ensure that post accident leakage of radioactive fluids or gases outside the secondary containment boundary is within design and analysis limits. For manual valves or blind flanges that are locked, sealed or otherwise secured in the correct position, the potential of these devices to be inadvertently misaligned is low. In addition, manual valves and blind flanges that are locked, sealed or otherwise secured in the correct position are verified to be in the correct position prior to locking, sealing, or securing. As a result of this control of the position of these manual secondary containment isolation devices, the periodic Surveillance of these devices in CTS 4.7.N.2.b is not required to help ensure that post accident leakage of radioactive fluids or gases outside the secondary containment boundary is maintained within the design and analysis limits. This change also provides the benefit of reduced radiation exposure to plant personnel through the elimination of the requirement to check the position of the manual valves and blind flanges, located in the radiation areas, that are locked, sealed or otherwise secured in the correct position.

RELOCATED SPECIFICATIONS

None

3.7 - LIMITING CONDITIONS FOR OPERATION

P. Standby Gas Treatment System

LA.1

LCO 3.6.4.3 Two independent standby gas treatment subsystems shall be OPERABLE.

APPLICABILITY:

OPERATIONAL MODE(s) 1, 2, 3 and *.

ACTION:

1. ACTION A With one standby gas treatment subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 7 days, or:

   a. ACTION B In OPERATIONAL MODE(s) 1,2 or 3, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

   b. ACTION C In OPERATIONAL MODE *, Add proposed Required Action C.1 L.1 suspend handling of irradiated fuel in the secondary containment, CORE ALTERATION(s), and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.C are not applicable.

2. ACTION D With both standby gas treatment subsystems inoperable in OPERATIONAL MODE(s) 1,2 or 3, restore at least one subsystem to OPERABLE status within one hour, or ACTION E be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4.7 - SURVEILLANCE REQUIREMENTS

P. Standby Gas Treatment System

Each standby gas treatment subsystem shall be demonstrated OPERABLE:

1. SR 3.6.4.3.1 At least once per 31 days by ~~initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and~~ verifying that the subsystem operates for at least 10 hours with the heaters operating. LA.2

add proposed SR 3.6.4.3.2

2. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the subsystem by:

   A.2 Moved to ITS Section 5.5

   a. Verifying that the subsystem satisfies the in-place penetration and bypass leakage testing acceptance criteria of <1% and uses the test procedure guidance in Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978, and the system flow rate is 4000 cfm ±10%.

   b. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM-D-3803-89, for a methyl iodide penetration of <2.5%, when tested at 30°C and 70% relative humidity; and

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Applicability * When handling irradiated fuel in the secondary containment, during CORE ALTERATION(s), and operations with a potential for draining the reactor vessel.

3.7 - LIMITING CONDITIONS FOR OPERATION

ACTION F

3. With both standby gas treatment subsystems inoperable in OPERATIONAL MODE *, suspend handling of irradiated fuel in the secondary containment, CORE ALTERATION(s), and operations with a potential for draining the reactor vessel. The provisions of Specification 3.0.C are not applicable.

4.7 - SURVEILLANCE REQUIREMENTS

c. Verifying a subsystem flow rate of 4000 cfm ±10% during system operation when tested in accordance with ANSI N510-1980. A.2 moved to ITS Section 5.5

3. After every 1440 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of ASTM-D-3803-89, for a methyl iodide penetration of <2.5%, when tested at 30°C and 70% relative humidity.

4. At least once per ~~18~~ 24 months by: LD.1

a. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is <6 inches water gauge while operating the filter train at a flow rate of 4000 cfm ±10%. A.2 moved to ITS Section 5.5

SR 3.6.4.3.3 b. Verifying that the filter train starts and isolation dampers open on each of the following test or actual signals: L.2

(1) ~~Manual initiation from the control room, and~~ LA.2

(2) Simulated automatic initiation signal. A.3

c. Verifying that the heaters dissipate 30 ±3 kw when tested in accordance with ANSI N510-1989. This reading shall include the appropriate correction for variations in voltage. A.2 moved to ITS Section 5.5

Applicability * When handling irradiated fuel in the secondary containment, during CORE ALTERATION(s), and operations with a potential for draining the reactor vessel.

3.7 - LIMITING CONDITIONS FOR OPERATION

4.7 - SURVEILLANCE REQUIREMENTS

A.2 moved to ITS Section 5.5

5. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter bank satisfies the in-place penetration and leakage testing acceptance criteria of <1% in accordance with ANSI N510-1980 while operating the system at a flow rate of 4000 cfm ±10%.

6. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorber bank satisfies the in-place penetration and leakage testing acceptance criteria of <1% in accordance with ANSI N510-1980 for a halogenated hydrocarbon refrigerant test gas while operating the system at a flow rate of 4000 cfm ±10%.

ADMINISTRATIVE

A.1 In the conversion of the Quad Cities 1 and 2 current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted that do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make the ITS consistent with the BWR Standard Technical Specifications, NUREG-1433, Rev. 1 (i.e., the Improved Standard Technical Specifications (ISTS)).

A.2 The filter testing requirements of CTS 4.7.P.2, 4.7.P.3, 4.7.P.4.a, 4.7.P.4.c, 4.7.P.5 and 4.7.P.6 are being moved to ITS 5.5.7 in accordance with the format of the BWR ISTS, NUREG-1433, Rev. 1. Any technical changes to these requirements will be addressed in the Discussion of Changes for ITS Section 5.5. A Surveillance Requirement is added (proposed ITS SR 3.6.4.3.2) to clarify that the tests of the Ventilation Filter Testing Program must also be completed and passed for determining OPERABILITY of the SGT System. Since this is a presentation preference that maintains current requirements, this change is considered administrative.

A.3 CTS 4.7.P.4.b, which verifies each SGT subsystem starts on the appropriate automatic initiation signals, is being divided into two Surveillances. The majority of the instrumentation testing will be performed in ITS SRs 3.3.6.2.3, 3.3.6.2.4, and 3.3.6.2.5 of ITS 3.3.6.2. The actual system functional test portion, which will ensure the SGT System starts on an initiation signal, will be performed as ITS SR 3.6.4.3.3. This ensures the entire system is tested with proper overlap. Since the ITS results in the same CTS requirements for testing, this change is considered administrative.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE

"Generic"

LA.1 The detail in CTS LCO 3.7.P relating to system design (i.e., that the SGT subsystems are "independent") is proposed to be relocated to the Bases. This is a design detail that is not necessary to be included in the Technical Specifications to ensure the OPERABILITY of the SGT subsystems, since OPERABILITY requirements are adequately addressed in ITS 3.6.4.3. Therefore, the relocated detail is not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

LA.2 Details in CTS 4.7.P.1 of the methods for performing the standby gas treatment subsystem 31 day operating Surveillance (by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers) and CTS 4.7.P.4.b.1 (verifying "Manual initiation from the control room") are proposed to be relocated to the Bases. These details are not necessary to ensure the OPERABILITY of the standby gas treatment subsystems. The requirements of ITS 3.6.4.3 and SR 3.6.4.3.1 are adequate to ensure the standby gas treatment subsystems are maintained OPERABLE. Therefore, the relocated details are not required to be in the ITS to provide adequate protection of the public health and safety. Changes to the Bases will be controlled by the provisions of the proposed Bases Control Program described in Chapter 5 of the ITS.

LD.1 The Frequency for performing CTS 4.7.P.4.b has been extended from 18 months to 24 months in proposed ITS SR 3.6.4.3.3 to facilitate a change to the Quad Cities 1 and 2 refuel cycle from 18 months to 24 months. The proposed change will allow these Surveillances to extend their Surveillance Frequency from the current 18 month Surveillance Frequency (i.e., a maximum of 22.5 months accounting for the allowable grace period specified in CTS 4.0.B and proposed SR 3.0.2) to a 24 month Surveillance Frequency (i.e., a maximum of 30 months accounting for the allowable grace period specified in CTS 4.0.B and proposed Specification 3.0.2). This proposed change was evaluated in accordance with the guidance provided in NRC Generic Letter No. 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

SR 3.6.4.3.3 verifies each SGT subsystem actuates on an actual or simulated initiation signal. Extending the Surveillance interval for this verification is acceptable in part because the system is operated every 31 days to satisfy the requirements of SR 3.6.4.3.1 which operates each SGT subsystem for a specified period of time that ensures both subsystems are OPERABLE and that all

TECHNICAL CHANGES - LESS RESTRICTIVE

LD.1 (cont'd) associated controls are functioning properly. This test will detect significant failures affecting system operation that would be detected by conducting the 24 month Surveillance test. In addition, the SGT system is designed with redundancy to meet the single active failure criteria, which will ensure system availability in the event of a failure of one of the subsystems. The actual or simulated initiation signals test overlaps the LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.4 of Secondary Containment Isolation Instrumentation. As stated in the NRC Safety Evaluation Report (dated August 2, 1993) relating to extension of the Peach Bottom Atomic Power Station, Unit Numbers 2 and 3 surveillance intervals from 18 to 24 months:

> "Industry reliability studies for boiling water reactors (BWRs), prepared by the BWR Owners Group (NEDC-30936P) show that the overall safety systems' reliabilities are not dominated by the reliabilities of the logic system, but by that of the mechanical components, (e.g., pumps and valves), which are consequently tested on a more frequent basis. Since the probability of a relay or contact failure is small relative to the probability of mechanical component failure, increasing the Logic System Functional Test interval represents no significant change in the overall safety system unavailability."

Reviews of historical maintenance and surveillance data have shown that these tests normally pass their Surveillances at the current Frequency. An evaluation has been performed using this data, and it has been determined that the effect on safety due to the extended Surveillance Frequency will be minimal. In addition, the proposed 24 month Surveillance Frequencies, if performed at the maximum interval allowed by proposed SR 3.0.2 (30 months) do not invalidate any assumptions in the plant licensing basis.

"Specific"

L.1 An alternative is proposed in the Quad Cities 1 and 2 ITS to suspending operations if an SGT subsystem cannot be returned to OPERABLE status within 7 days, and movement of irradiated fuel assemblies, CORE ALTERATIONS, or OPDRVs are being conducted. The alternative, ITS 3.6.4.3 Required Action C.1, is to place the OPERABLE SGT subsystem in operation and continue to conduct operations (e.g., OPDRVs). Since one subsystem is sufficient for any accident, the risk of failure of the subsystem to perform its intended function is significantly reduced if it is operating.

TECHNICAL CHANGES - LESS RESTRICTIVE (continued)

L.2 The phrase "actual or," in reference to the initiation test signal in CTS 4.7.P.4.b, has been added to proposed ITS SR 3.6.4.3.3, which verifies that each subsystem actuates on an automatic initiation signal. This allows satisfactory automatic SGT System initiations for other than Surveillance purposes to be used to fulfill the Surveillance Requirement. Operability is adequately demonstrated in either case since the SGT subsystem itself cannot discriminate between "actual" or "test" signals.

RELOCATED SPECIFICATIONS

None

DISCUSSION OF CHANGES
ITS: SECTION 3.6 - CONTAINMENT SYSTEMS BASES

The Bases of the current Technical Specifications for this section (pages B 3/4.7-1 through B 3/4.7-8) have been completely replaced by revised Bases that reflect the format and applicable content of the Quad Cities 1 and 2 ITS Section 3.6, consistent with the BWR ISTS, NUREG-1433, Rev. 1. The revised Bases are shown in the Quad Cities 1 and 2 ITS Bases. In addition, pages 3/4.7-2, 3/4.7-3 and 3/4.7-15, which are blank pages, have been removed.