PACKAGE 3.6

CONTAINMENT SYSTEMS

PART E

MARKUP OF NUREG-1431
IMPROVED STANDARD TECHNICAL SPECIFICATIONS AND BASES

List of Pages

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 AND 2

Improved Technical Specifications
Conversion Submittal

CL3.6-101

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

CL3.6-101

LCO 3.6.1 Containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment inoperable.	A.1 Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage rate testing except for containment air lock testing, in accordance with the Containment Leakage Rate Testing Program ~~10 CFR 50, Appendix J, as modified by approved exemptions~~. ~~The leakage rate acceptance criterion is ≤ 1.0 L_a. However, during the first unit startup following testing performed in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, the leakage rate acceptance criteria are < 0.6 L_a for the Type B and Type C tests, and < 0.75 L_a for the Type A test.~~	~~-----NOTE----- SR 3.0.2 is not applicable~~ --------- CL3.6-102 In accordance with the Containment Leakage Rate Testing Program ~~10 CFR 50, Appendix J, as modified by approved exemptions~~
~~SR 3.6.1.2~~	~~Verify containment structural integrity in accordance with the Containment Tendon Surveillance Program.~~	~~In accordance with the Containment Tendon Surveillance Program~~ CL3.6-101
SR 3.6.1.2	Verify containment average air temperature ≤ 44 °F above shield building average air temperature.	Prior to entering MODE 4 from MODE 5 CL3.6-103

SURVEILLANCE		FREQUENCY
SR 3.6.1.3	Verify containment shell temperature ≥ 30 °F.	Prior to entering MODE 4 from MODE 5

CL3.6-104

CL3.6-101

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Locks~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

CL3.6-101

LCO 3.6.2 ~~[Two]~~ containment air lock~~[s]~~ shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

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

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

2. Separate Condition entry is allowed for each air lock.

3. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate acceptance criteria.

PA3.6-106

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment air locks with one containment air lock door inoperable.	------------NOTES------------ 1. Required Actions A.1, A.2, and A.3 are not applicable if both doors in the same air lock are inoperable and Condition C is entered. 2. Entry and exit is permissible for 7 days under administrative controls [if both air locks are inoperable]. ----------------------------	(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.1	Verify the OPERABLE door is closed in the affected air lock.	1 hour
	<u>AND</u>		
	A.2	Lock the OPERABLE door closed in the affected air lock.	24 hours
	<u>AND</u>		
	A.3	--------NOTE--------- Air lock doors in high radiation areas may be verified locked closed by administrative means. ---------------------	
		Verify the OPERABLE door is locked closed in the affected air lock.	Once per 31 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more containment air locks with 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 same air lock are inoperable and Condition C is entered. 2. Entry and exit of containment is permissible under the control of a dedicated individual. ----------------------------	
	B.1 Verify an OPERABLE door is closed in the affected air lock.	1 hour
	<u>AND</u>	
	B.2 Lock an OPERABLE door closed in the affected air lock.	24 hours
	<u>AND</u>	
	B.3 --------NOTE--------- Air lock doors in high radiation areas may be verified locked closed by administrative means. ---------------------	
	Verify an OPERABLE door is locked closed in the affected air	Once per 31 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
			(continued)
C. One or more containment air locks inoperable for reasons other than Condition A or B.	C.1	Initiate action to evaluate overall containment leakage rate per LCO 3.6.1.	Immediately
	AND		
	C.2	Verify a door is closed in the affected air lock.	1 hour
	AND		
	C.3	Restore air lock to OPERABLE status.	24 hours
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	-------------------NOTES------------------ 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~~of~~ SR 3.6.1.1 ~~in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions~~. --	CL3.6-102
	Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J, as modified by approved exemptions~~. ~~The acceptance criteria for air lock testing are:~~ ~~a. Overall air lock leakage rate is $\leq$ [0.05 L_a] when tested at $\geq P_a$.~~ ~~b. For each door, leakage rate is $\leq$ [.01 L_a] when tested at $\geq$ [psig].~~	~~NOTE~~ ~~SR 3.0.2 is not applicable~~ In accordance with the Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J, as modified by approved exemptions~~ CL3.6-102

SURVEILLANCE		FREQUENCY
SR 3.6.2.2	~~NOTE~~ ~~Only required to be performed upon entry or exit through the containment air lock.~~ Verify only one door in each ~~the~~ air lock can be opened at a time.	24 months ~~184 days~~

TA3.6-107

X3.6-108

 CL3.6-101

3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~ CL3.6-101

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

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

1. Non-automatic p~~P~~enetration flow path(s) ~~[~~except for 36 ~~[42]~~ inch containment purge system~~valve~~ flow paths~~]~~ may be unisolated intermittently under administrative controls. PA3.6-113

2. Separate Condition entry is allowed for each penetration flow path. PA3.6-114

3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

CL3.6-101

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Only applicable to penetration flow paths which do not use a closed system as a ~~with two~~ containment isolation boundary~~valves~~. --------------------- One or more penetration flow paths with one containment isolation valve inoperable ~~[except for purge valve or shield building bypass leakage not within limit]~~.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated or mechanically blocked power operated ~~automatic~~ valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	4 hours (continued)

PA3.6-117

PA3.6-116

PA3.6-125

CL3.6-121

CL3.6-101

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.	TA3.6-119 Once per 31 days for isolation devices outside containment <u>AND</u> Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment

CL3.6-101

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- Only applicable to penetration flow paths which do not use a closed system as a ~~with two~~ containment isolation boundary~~valves~~. --------------------- One or more penetration flow paths with two containment isolation valves inoperable ~~[except for purge valve or shield building bypass leakage not within limit]~~.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated power operated~~automatic~~ valve, closed manual valve, or blind flange.	1 hour

PA3.6-116

PA3.6-125

(continued)

CL3.6-101

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. ---------NOTE--------- Only applicable to penetration flow paths which use ~~with only one containment isolation valve and~~ a closed system as a containment isolation boundary. --------------------- One or more penetration flow paths with one containment isolation valve inoperable.	C.1	Isolate the affected penetration flow path by use of at least one closed and de-activated power operated ~~automatic~~ valve, closed manual valve, or blind flange.	72 ~~[4]~~ hours
	AND		
	C.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

TA3.6-122

PA3.6-125

PA3.6-116

TA3.6-119

CL3.6-101

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~D. Shield building bypass leakage not within limit.~~	~~D.1 Restore leakage within limit.~~	~~4 hours~~
~~E. One or more penetration flow paths with one or more containment purge valves not within purge valve leakage limits.~~	~~E.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].~~ ~~AND~~	~~24 hours~~ ~~(continued)~~

PA3.6-124

CL3.6-126

CL3.6-101

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~E. (continued)~~	~~E.2 -------NOTE------- Isolation devices in high radiation areas may be verified by use of administrative means.~~ ~~-------------------------~~ ~~Verify the affected penetration flow path is isolated.~~	~~Once per 31 days for isolation devices outside containment~~ ~~AND~~ ~~Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days for isolation devices inside containment~~
	~~AND~~	
	~~E.3 Perform SR 3.6.3.7 for the resilient seal purge valves closed to comply with Required Action E.1.~~	~~Once per [92] days~~

CL3.6-126

CL3.6-101

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DF. Required Action and associated Completion Time not met.	DF.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	DF.2 Be in MODE 5.	36 hours

CL3.6-101

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each 36 ~~[42]~~ inch containment purge penetration blind flange is installed ~~valve is sealed closed, except for one purge valve in a penetration flow path while in Condition E of this LCO~~.	Prior to entering MODE 4 from MODE 5 ~~31 days~~
SR 3.6.3.2	Verify each 18 ~~[8]~~ inch containment inservice purge penetration ~~valve~~ is blind flanged and meets SR 3.6.1.1 ~~closed, except when the [8] inch containment purge valves are open for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open~~.	After each use of the 18 inch containment inservice purge system ~~31 days~~

CL3.6-127

CL3.6-131

CL3.6-101

SURVEILLANCE		FREQUENCY
SR 3.6.3.3	-------------------NOTE------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. -- Verify each non-automatic containment isolation ~~manual~~ valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	X3.6-123 92 ~~31~~ days PA3.6-125 TA3.6-132

(continued)

SR 3.6.3.4	-------------------NOTE------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -- Verify each non-automatic containment isolation ~~manual~~ valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	PA3.6-125 Prior to entering MODE 4 from MODE 5 if not performe d within the previous 92 days TA3.6-132

CL3.6-101

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.5	Verify the isolation time of each ~~power operated and each~~ automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program ~~or 92 days~~
~~SR 3.6.3.6~~	~~Cycle each weight or spring loaded check valve testable during operation through one complete cycle of full travel, and verify each check valve remains closed when the differential pressure in the direction of flow is ≤ [1.2] psid and opens when the differential pressure in the direction of flow is ≥ [1.2] psid and < [5.0] psid.~~	~~92 days~~

TA3.6-134

CL3.6-136

(continued)

SR 3.6.3.6~~7~~	Perform leakage rate testing for 18 inch containment inservice purge valves with resilient seals.	Prior to system use~~184 days~~ ~~AND~~ ~~Within 92 days after opening the valve~~

CL3.6-137

CL3.6-101

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.7~~8~~	Verify each automatic containment isolation valve that is not locked, sealed or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	24~~[18]~~ months CL3.6-141
~~SR 3.6.3.9~~	~~Cycle each weight or spring loaded check valve not testable during operation through one complete cycle of full travel, and verify each check valve remains closed when the differential pressure in the direction of flow is ≤ [1.2] psid and opens when the differential pressure in the direction of flow is ≥ [1.2] psid and < [5.0] psid.~~	~~18 months~~ CL3.6-136
~~SR 3.6.3.10~~	~~Verify each [ ] inch containment purge valve is blocked to restrict the valve from opening > [50]%.~~	~~[18] months~~ CL3.6-142

(continued)

CL3.6-101

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.8~~11~~	Verify the combined leakage rate for all shield building bypass leakage paths is in accordance with the Containment Leakage Rate Testing Program ~~≤ [L_a] when pressurized to ≥ [psig]~~.	~~NOTE~~ ~~SR 3.0.2 is not applicable~~ CL3.6-102 In accordance with the Containment Leakage Rate Testing Program ~~10 CFR 50, Appendix J, as modified by approved exemptions~~

CL3.6-101

3.6 CONTAINMENT SYSTEMS

3.6.4~~A~~ Containment Pressure~~(Atmospheric, Dual, and Ice Condenser)~~

LCO 3.6.4~~A~~ Containment pressure shall be ~~≥ [-0.3] psig and~~ ≤ ~~+~~2.0~~[+1.5]~~ psig.

CL3.6-143

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	8~~1~~ hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

CL3.6-144

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4~~A~~.1 Verify containment pressure is within limits.	12 hours

~~3.6 CONTAINMENT SYSTEMS~~

CL3.6-103

~~3.6.5A Containment Air Temperature (Atmospheric and Dual)~~

~~LCO 3.6.5A Containment average air temperature shall be ≤ [120]°F.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. Containment average air temperature not within limit.~~	~~A.1 Restore containment average air temperature to within limit.~~	~~8 hours~~
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~B.2 Be in MODE 5.~~	~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.5A.1 Verify containment average air temperature is within limit.~~	~~24 hours~~

3.6 CONTAINMENT SYSTEMS

3.6.5~~6A~~ Containment Spray and Cooling Systems ~~(Atmospheric and Dual)~~ ~~(Credit taken for iodine removal by the Containment Spray System)~~

CL3.6-101

CL3.6-146

LCO 3.6.5~~6A~~ Two containment spray trains and ~~[two]~~ containment cooling trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours ~~AND~~ ~~10 days from discovery of failure to meet the LCO~~
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

CL3.6-147

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One~~ [required]~~ containment cooling train inoperable.	C.1 Restore~~ [required]~~ containment cooling train to OPERABLE status.	7 days CL3.6-151 ~~AND~~ ~~10 days from discovery of failure to meet the LCO~~ CL3.6-147
~~D. Two [required] containment cooling trains inoperable.~~	~~D.1 Restore one [required] containment cooling train to OPERABLE status.~~	~~72 hours~~ CL3.6-152
D~~E~~. Required Action and associated Completion Time of Condition C~~ or D~~ not met.	D~~E~~.1 Be in MODE 3. AND D~~E~~.2 Be in MODE 5.	6 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~F. Two containment spray trains inoperable.~~ ~~OR~~ ~~Any ombination of three or more trains inoperable.~~	~~F.1 Enter LCO 3.0.3.~~	~~Im me diately~~ CL3.6-152

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5~~6A~~.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 days

(continued)

SR 3.6.5~~6A~~.2	Operate each ~~[required]~~ containment cooling train fan coil unit on low motor speed for ≥ 15 minutes.	31 days CL3.6-153 CL3.6-154
SR 3.6.5~~6A~~.3	Verify each ~~[required]~~ containment cooling train cooling water flow rate to each fan coil unit is ≥ 900~~[700]~~ gpm.	24 months ~~31 days~~ CL3.6-153 CL3.6-141 PA3.6-156

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.5~~6A~~.4	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.5~~6A~~.5	Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24~~[18]~~ months CL3.6-141
SR 3.6.5~~6A~~.6	Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	24~~[18]~~ m onths CL3.6-141
SR 3.6.5~~6A~~.7	Verify each ~~[required]~~ containment cooling train starts automatically on an actual or simulated actuation signal.	CL3.6-151 24~~[18]~~ months CL3.6-141

CL3.6-101

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.6.5~~6A~~.8 Verify each spray nozzle is unobstructed.	~~At first refueling~~ ~~AND~~ 10 years PA3.6-157

CL3.6-101

3.6 CONTAINMENT SYSTEMS

3.6.6~~7~~ Spray Additive System ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

CL3.6-101

LCO 3.6.6~~7~~ The Spray Additive System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	24~~72~~ hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

CL3.6-161

CL3.6-101

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY	
SR 3.6.6~~7~~.1	Verify each spray additive manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 days	
SR 3.6.6~~7~~.2	Verify spray additive tank solution volume is ≥ 2590 gal (89%)~~[2568] gal and ≤ [4000] gal~~.	184 days	CL3.6-162
SR 3.6.6~~7~~.3	Verify spray additive tank ~~[NaOH]~~ solution concentration is ≥ 9~~[30]~~% and ≤ 11~~[32]~~% by weight.	184 days	
SR 3.6.6~~7~~.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24~~[18]~~ months	CL3.6-141
~~SR 3.6.7.5~~	~~Verify spray additive flow [rate] from each solution's flow path.~~	~~5 years~~	CL3.6-163

3.6 CONTAINMENT SYSTEMS

3.6.7~~8~~ Hydrogen Recombiners ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual) (if permanently installed)~~

CL3.6-101

LCO 3.6.7~~8~~ Two hydrogen recombiners shall be OPERABLE.

CL3.6-164

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One hydrogen recombiner inoperable.	A.1 --------NOTE--------- LCO 3.0.4 is not applicable. --------------------- Restore hydrogen recombiner to OPERABLE status.	 30 days

CL3.6-101

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B. Two hydrogen recombiners inoperable.~~	~~B.1 Verify by administrative means that the hydrogen control function is maintained.~~ ~~AND~~ ~~B.2 Restore one hydrogen recombiner to OPERABLE status.~~	~~1 hour~~ ~~AND~~ ~~Once per 12 hours thereafter~~ ~~7 days~~
B~~C~~. Required Action and associated Completion Time not met.	B~~C~~.1 Be in MODE 3.	6 hours

CL3.6-166

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7~~8~~.1	Perform a system functional test for each hydrogen recombiner.	24~~[18]~~ months CL3.6-141
SR 3.6.7~~8~~.2	Visually examine each hydrogen recombiner enclosure and verify there is no evidence of abnormal conditions.	24~~[18]~~ months CL3.6-141
SR 3.6.7~~8~~.3	Perform a resistance to ground test for each heater phase.	24~~[18]~~ months CL3.6-141

CL3.6-167

3.6 CONTAINMENT SYSTEMS

CL3.6-167

3.6.8~~12~~ Vacuum Breaker System~~Relief Valves (Atmospheric and Ice Condenser)~~

LCO 3.6.8~~12~~ ~~[~~Two~~]~~ vacuum breaker trains~~relief lines~~ shall be OPERABLE.

PA3.6-171

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment isolation function of o~~O~~ne vacuum breaker train~~relief line~~ inoperable.	A.1 Enter LCO 3.6.3 Condition A~~Restore vacuum relief line to OPERABLE status~~.	Immediately~~72 hours~~ CL3.6-172
B. Vacuum relief function of one vacuum breaker train inoperable.	B.1 Restore vacuum breaker train vacuum relief function to OPERABLE status.	7 days CL3.6-172
C~~B~~. Required Action and associated Completion Time not met.	C~~B~~.1 Be in MODE 3. AND C~~B~~.2 Be in MODE 5.	6 hours 36 hours

CL3.6-167

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8~~12~~.1	Verify each vacuum breaker train~~relief line is OPERABLE in accordance with the Inservice Testing Program~~ opens on an actual or simulated containment vacuum equal to or more negative than -0.5 psi and closes on an actual or simulated actuation signal.	92 days ~~In accordance with the Inservice Testing Program~~ CL3.6-173 CL3.6-181
SR 3.6.8.2	Perform CHANNEL CALIBRATION.	24 months

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.9 Hydrogen Mixing System (HMS) (Atmospheric, Ice Condenser, and Dual)~~

~~LCO 3.6.9 [Two] HMS trains shall be OPERABLE.~~ CL3.6-168

~~APPLICABILITY: MODES 1 and 2.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One HMS train inoperable.~~	~~A.1 ---------NOTE---------~~ ~~LCO 3.0.4 is not applicable.~~ ~~-------------------------~~ ~~Restore HMS train to OPERABLE status.~~	 ~~30 days~~
~~B. Two HMS trains inoperable.~~	~~B.1 Verify by administrative means that the hydrogen control function is maintained.~~ ~~AND~~ ~~B.2 Restore one HMS train to OPERABLE status.~~	~~1 hour~~ ~~AND~~ ~~Once per 12 hours thereafter~~ ~~7 days~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~C. Required Action and associated Completion Time not met.~~	~~C.1 Be in MODE 3.~~	~~6 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.6.9.1~~	~~Operate each HMS train for ≥ 15 minutes.~~	~~92 days~~
~~SR 3.6.9.2~~	~~Verify each HMS train flow rate on slow speed is ≥ [4000] cfm.~~	~~[18] months~~
~~SR 3.6.9.3~~	~~Verify each HMS train starts on an actual or simulated actuation signal.~~	~~[18] months~~

CL3.6-101

PA3.6-174

3.6 CONTAINMENT SYSTEMS

3.6.9~~13~~ Shield Building Ventilation~~Air Cleanup~~ System (SBV~~AC~~S) ~~(Dual and Ice Condenser)~~

PA3.6-174

LCO 3.6.9~~13~~ Two SBV~~AC~~S trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SBV~~AC~~S train inoperable.	A.1 Restore SBV~~AC~~S train to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.9~~13~~.1 Operate each SBV~~AC~~S train for ~~[~~≥ 10 continuous hours with heaters operating ~~or (for systems without heaters) ≥ 15 minutes]~~.	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.9~~13~~.2	Perform required SBVACS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

(continued)

SR 3.6.9~~13~~.3	Verify each SBVACS train actuates on an actual or simulated actuation signal.	24~~[18]~~ m onths CL3.6-141
SR 3.6.9~~13~~.4	Verify SBVS isolation dampers actuate on an actual or simulated signal.~~Verify each SBACS filter bypass damper can be opened.~~	24~~[18]~~ months CL3.6-176 CL3.6-141
SR 3.6.9~~13~~.5	Verify each SBVACS train OPERABLE~~flow rate is ≥ [ ] cfm~~ and produces a pressure equal to or more negative than -2.00 inches water gage and maintains a pressure equal to or more negative than -1.82 inches water gage in the annulus.	31 days~~[18] months on a STAGGERED TEST BASIS~~ CL3.6-177

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.10 Hydrogen Ignition System (HIS) (Ice Condenser)~~

CL3.6-169

~~LCO 3.6.10 Two HIS trains shall be OPERABLE.~~

~~APPLICABILITY: MODES 1 and 2.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One HIS train inoperable.~~	~~A.1 Restore HIS train to OPERABLE status.~~ ~~OR~~ ~~A.2 Perform SR 3.6.10.1 on the OPERABLE train.~~	~~7 days~~ ~~Once per 7 days~~
~~B. One containment region with no OPERABLE hydrogen ignitor.~~	~~B.1 Restore one hydrogen ignitor in the affected containment region to OPERABLE status.~~	~~7 days~~
~~C. Required Action and associated Completion Time not met.~~	~~C.1 Be in MODE 3.~~	~~6 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.6.10.1~~	~~Energize each HIS train power supply breaker and verify ≥ [32] ignitors are energized in each train.~~	~~92 days~~
~~SR 3.6.10.2~~	~~Verify at least one hydrogen ignitor is OPERABLE in each containment region.~~	~~92 days~~
~~SR 3.6.10.3~~	~~Energize each hydrogen ignitor and verify temperature is ≥ [1700]°F.~~	~~[18] months~~

3.6 CONTAINMENT SYSTEMS

3.6.10~~9~~ Shield Building~~(Dual and Ice Condenser)~~ CL3.6-101

LCO 3.6.10~~9~~ The shield building shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Shield building inoperable.	A.1 Restore shield building to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
~~SR 3.6.19.1 Verify annulus negative pressure is > [5] inches water gauge.~~	~~12 hours~~ CL3.6-182

CL3.6-101

SURVEILLANCE		FREQUENCY
SR 3.6.10~~9~~.1~~2~~	Verify ~~each~~ one shield building access door in each access opening is closed~~, except when the access opening is being used for normal transient entry and exit[; then, at least one door shall be closed]~~.	31 days TA3.6-183
~~SR 3.6.19.3~~	~~Verify shield building structural integrity by performing a visual inspection of the exposed interior and exterior surfaces of the shield building.~~	CL3.6-184 ~~During shutdow n for SR 3.6.1.1 Type A tests~~
~~SR 3.6.19.4~~	~~Verify each Shield Building Air Cleanup System train with final flow ≤ [ ] cfm produces a pressure equal to or more negative than [-0.5] inch water gauge in the annulus within [22] seconds after a start signal.~~	~~[18] months on a STAGGERED TEST BASIS~~ CL3.6-177

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.11 Iodine Cleanup System (ICS) (Atmospheric and Subatmospheric)~~

~~LCO 3.6.11 Two ICS trains shall be OPERABLE.~~

CL3.6-169

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One ICS train inoperable.~~	~~A.1 Restore ICS train to OPERABLE status.~~	~~7 days~~
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~ ~~AND~~ ~~B.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.11.1 Operate each ICS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].~~	~~31 days~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~	~~FREQUENCY~~
SR ~~3.6.11.2 Perform required ICS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).~~	~~In accordance with the VFTP~~
	~~(continued)~~
SR ~~3.6.11.3 Verify each ICS train actuates on an actual or simulated actuation signal.~~	~~[18]~~ months
[~~SR 3.6.11.4 Verify each ICS filter bypass damper can be opened.~~	~~[18] months~~]

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.14 Air Return System (ARS) (Ice Condenser)~~

CL3.6-169

~~LCO 3.6.14 Two ARS trains shall be OPERABLE.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One ARS train inoperable.~~	~~A.1 Restore ARS train to OPERABLE status.~~	~~72 hours~~
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~B.2 Be in MODE 5.~~	~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.14.1 Verify each ARS fan starts on an actual or simulated actuation signal, after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes.~~	~~[92] days~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~		~~FREQUENCY~~
		~~(continued)~~
~~SR 3.6.14.2~~	~~Verify, with the ARS fan dampers closed, each ARS fan motor current is ≥ [20.5] amps and ≤ [35.5] amps [when the fan speed is ≥ [840] rpm and ≤ [900] rpm].~~	~~92 days~~
~~SR 3.6.14.3~~	~~Verify, with the ARS fan not operating, each ARS fan damper opens when ≤ [11.0] lb is applied to the counterweight.~~	~~92 days~~
[~~SR 3.6.14.4~~	~~Verify each motor operated valve in the hydrogen collection header that is not locked, sealed, or otherwise secured in position, opens on an actual or simulated actuation signal after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes.~~	~~92 days~~]

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.15 Ice Bed (Ice Condenser)~~

CL3.6-169

~~LCO 3.6.15 The ice bed shall be OPERABLE.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. Ice bed inoperable.~~	~~A.1 Restore ice bed to OPERABLE status.~~	~~48 hours~~
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~B.2 Be in MODE 5.~~	~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.15.1 Verify maximum ice bed temperature is ≤ [27]°F.~~	~~12 hours~~

~~(continued)~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.6.15.2~~	~~Verify total weight of stored ice is ≥ [2,721,600] lb by:~~ ~~a. Weighing a representative sample of ≥ 144 ice baskets and verifying each basket contains ≥ [1400] lb of ice; and~~ ~~b. Calculating total weight of stored ice, at a 95% confidence level, using all ice basket weights determined in SR 3.6.15.2.a.~~	~~9 months~~
~~SR 3.6.15.3~~	~~Verify azimuthal distribution of ice at a 95% confidence level by subdividing weights, as determined by SR 3.6.15.2.a, into the following groups:~~ ~~a. Group 1 - bays 1 through 8;~~ ~~b. Group 2 - bays 9 through 16; and~~ ~~c. Group 3 - bays 17 through 24.~~ ~~The average ice weight of the sample baskets in each group from radial rows 1, 2, 4, 6, 8, and 9 shall be ≥ [1400] lb.~~	~~9 months~~
~~SR 3.6.15.4~~	~~Verify, by visual inspection, accumulation of ice or frost on structural members comprising flow channels through the ice condenser is ≤ [0.38] inch thick.~~	~~9 months~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~	~~FREQUENCY~~
	~~(continued)~~
~~SR 3.6.15.5 Verify by chemical analyses of at least nine representative samples of stored ice:~~ ~~a. Boron concentration is ≥ [1800] ppm; and~~ ~~b. pH is ≥ [9.0] and ≤ [9.5].~~	~~[18] months~~
~~SR 3.6.15.6 Visually inspect, for detrimental structural wear, cracks, corrosion, or other damage, two ice baskets from each azimuthal group of bays. See SR 3.6.15.3.~~	~~40 months~~

~~3.6 CONTAINMENT SYSTEMS~~

CL3.6-169

~~3.6.16 Ice Condenser Doors (Ice Condenser)~~

~~LCO 3.6.16 The ice condenser inlet doors, intermediate deck doors, and top deck [doors] shall be OPERABLE and closed.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~NOTE~~
~~Separate Condition entry is allowed for each ice condenser door.~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One or more ice condenser inlet doors inoperable due to being physically restrained from opening.~~	~~A.1 Restore inlet door to OPERABLE status.~~	~~1 hour~~

ACTIONS (continued)

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~B. One or more ice condenser doors inoperable for reasons other than Condition A or not closed.~~	~~B.1 Verify maximum ice bed temperature is ≤ [27]°F.~~	~~Once per 4 hours~~
	~~AND~~	
	~~B.2 Restore ice condenser door to OPERABLE status and closed positions.~~	~~14 days~~

~~(continued)~~

~~C. Required Action and associated Completion Time of Condition B not met.~~	~~C.1 Restore ice condenser door to OPERABLE status and closed positions.~~	~~48 hours~~
~~D. Required Action and associated Completion Time of Condition A or C not met.~~	~~D.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~D.2 Be in MODE 5.~~	~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.6.16.1~~	~~Verify all inlet doors indicate closed by the Inlet Door Position Monitoring System.~~	~~12 hours~~
~~SR 3.6.16.2~~	~~Verify, by visual inspection, each intermediate deck door is closed and not impaired by ice, frost, or debris.~~	~~7 days~~
~~SR 3.6.16.3~~	~~Verify, by visual inspection, each inlet door is not impaired by ice, frost, or debris.~~	~~3 months during first year after receipt of license~~ ~~AND~~ ~~[18] months~~

~~(continued)~~

~~SR 3.6.16.4~~	~~Verify torque required to cause each inlet door to begin to open is ≤ [675] in-lb.~~	~~3 months during first year after receipt of license~~ ~~AND~~ ~~[18] months~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.16.5 Perform a torque test on [a sampling of ≥ 25% of the] inlet doors.~~	~~3 months during first year after receipt of license~~ ~~AND~~ ~~[18] months~~
~~SR 3.6.16.6 Verify for each intermediate deck door:~~ ~~a. No visual evidence of structural deterioration;~~ ~~b. Free movement of the vent assemblies; and~~ ~~c. Free movement of the door.~~	~~3 months during first year after receipt of license~~ ~~AND~~ ~~[18] months~~
~~SR 3.6.16.7 Verify, by visual inspection, each top deck [door]:~~ ~~a. Is in place; and~~ ~~b. Has no condensation, frost, or ice formed on the [door] that would restrict its opening.~~	~~92 days~~

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.17 Divider Barrier Integrity (Ice Condenser)~~

CL3.6-169

~~LCO 3.6.17 Divider barrier integrity shall be maintained.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. ----------NOTE----------~~ ~~For this action, separate Condition entry is allowed for each personnel access door or equipment hatch.~~ ~~------------------------~~ ~~One or more personnel access doors or equipment hatches open or inoperable, other than for personnel transit entry.~~	~~A.1 Restore personnel access doors and equipment hatches to OPERABLE status and closed positions.~~	~~1 hour~~
~~B. Divider barrier seal inoperable.~~	~~B.1 Restore seal to OPERABLE status.~~	~~1 hour~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~C. Required Action and associated Completion Time not met.~~	~~C.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~C.2 Be in MODE 5.~~	~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.6.17.1 Verify, by visual inspection, all personnel access doors and equipment hatches between upper and lower containment compartments are closed.~~	~~Prior to entering MODE 4 from MODE 5~~
~~SR 3.6.17.2 Verify, by visual inspection, that the seals and sealing surfaces of each personnel access door and equipment hatch have:~~ ~~a. No detrimental misalignments;~~ ~~b. No cracks or defects in the sealing surfaces; and~~ ~~c. No apparent deterioration of the seal material.~~	~~Prior to final closure after each opening~~ ~~AND~~ ~~-----NOTE-----~~ ~~Only required for seals made of resilient materials~~ ~~---------------~~ ~~10 years~~
~~SR 3.6.17.3 Verify, by visual inspection, each personnel access door or equipment hatch that has been opened for personnel transit entry is closed.~~	~~After each opening~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.6.17.4~~	~~Remove two divider barrier seal test coupons and verify:~~ ~~a. Both test coupons' tensile strength is ≥ [120] psi; [and]~~ ~~b. Both test coupons' elongation is ≥ [100]%.~~	~~[18] months~~

~~(continued)~~

~~SR 3.6.17.5~~	~~Visually inspect ≥ [95]% of the divider barrier seal length, and verify:~~ ~~a. Seal and seal mounting bolts are properly installed; and~~ ~~b. Seal material shows no evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearance.~~	~~[18] months~~

~~3.6 CONTAINMENT SYSTEMS~~

~~3.6.18 Containment Recirculation Drains (Ice Condenser)~~

CL3.6-169

~~LCO 3.6.18 The ice condenser floor drains and the refueling canal drains shall be OPERABLE.~~

~~APPLICABILITY: MODES 1, 2, 3, and 4.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One ice condenser floor drain inoperable.~~	~~A.1 Restore ice condenser floor drain to OPERABLE status.~~	~~1 hour~~
~~B. One refueling canal drain inoperable.~~	~~B.1 Restore refueling canal drain to OPERABLE status.~~	~~1 hour~~
~~C. Required Action and associated Completion Time not met.~~	~~C.1 Be in MODE 3.~~ ~~AND~~ ~~C.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE REQUIREMENTS~~	~~FREQUENCY~~
~~SR 3.6.18.1 Verify, by visual inspection, that:~~ ~~a. Each refueling canal drain plug is removed;~~ ~~b. Each refueling canal drain is not obstructed by debris; and~~ ~~c. No debris is present in the upper compartment or refueling canal that could obstruct the refueling canal drain.~~	~~92 days~~ ~~AND~~ ~~Prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal~~
~~SR 3.6.18.2 Verify for each ice condenser floor drain that the:~~ ~~a. Valve opening is not impaired by ice, frost, or debris;~~ ~~b. Valve seat shows no evidence of damage;~~ ~~c. Valve opening force is ≤ [66] lb; and~~ ~~d. Drain line from the ice condenser floor to the lower compartment is unrestricted.~~	~~[18] months~~

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.1 Containment ~~(Dual)~~

BASES

BACKGROUND

The containment is a free standing steel pressure vessel surrounded by a reinforced concrete shield building. The containment vessel, including all its penetrations, is a low leakage steel shell designed to contain radioactive material that may be released from the reactor core following a ~~d~~Design ~~b~~Basis Loss of Coolant Accident (LOCA) ~~(DA)~~. Additionally, the containment and shield building provide shielding from the fission products that may be present in the containment atmosphere following accident conditions. CL3.6-102

The containment vessel is a vertical cylindrical steel pressure vessel with a hemispherical dome and ellipsoidal bottom, completely enclosed by a reinforced concrete shield building. A ~~5~~4 ft wide annular space exists between the walls ~~and domes~~ of the steel containment vessel and the concrete shield building and 7 ft clearance exists between the roofs of the containment vessel and shield building to permit inservice inspection and collection of containment outleakage. ~~Dual containments utilize an outer concrete building for shielding and an inner steel containment for leak tightness.~~ PA3.6-187

Containment piping penetration assemblies provide for the passage of process, service, sampling and instrumentation pipelines into the containment vessel while maintaining containment OPERABILITY. The shield building provides shielding and allows controlled release of the annulus atmosphere under accident conditions, as well as environmental missile protection for the containment vessel and the Nuclear Steam Supply System.

The inner steel containment and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 leakage rate requirements comply with ~~10 CFR 50, Appendix J (~~Reference~~. 1)~~, as modified by approved exemptions.

BASES

BACKGROUND (continued)

The isolation devices for the penetrations in the 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 3.6.3, "Containment Isolation Valves";

b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, "Containment Air Locks"; and

PA3.6-188

c. All equipment hatches are closed. ~~; and~~

~~d. The pressurized sealing mechanism associated with a penetration is OPERABLE, except as provided in LCO 3.6.[ ].~~

APPLICABLE SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting Design Basis Accident (DBA) without exceeding the design leakage rate.

CL3.6-102

The DBAs that result in a challenge to containment OPERABILITY from high pressures and temperatures are a ~~loss of coolant accident (~~LOCA~~),~~ and a steam line break~~, and a~~

~~rod ejection accident (REA)~~ (Ref. 2). In addition, release of significant fission product radioactivity within containment can occur from a LOCA ~~or REA~~. In the DBA analyses, it is assumed that the containment is OPERABLE such that, for the DBAs involving release of fission product radioactivity, release to the environment is controlled by the rate of containment leakage. The reactor containment vessel, including the penetrations, is designed for low leakage to minimize the consequences (dose) to the general public during a DBA. The maximum allowable containment leakage rate is an input to the dose analyses. In the Final Safety Analysis Report (FSAR), the maximum allowable containment leakage used in the large break LOCA dose analysis was 2.5 weight percent per day. In the SER, the AEC concluded that a maximum containment leakage of 0.5 weight percent per day was acceptable. This formed the basis for the original plant Technical Specification leakage limit of 0.5 weight percent per day. Subsequently, it was concluded that the Shield Building leakage was higher than anticipated which increased the calculated dose. With the higher Shield Building leakage, in order to reduce the calculated dose, the maximum allowable containment leakage was reduced to 0.25 weight percent per day~~was designed with an allowable leakage rate of [0.1]% of containment air weight per day~~ (Ref. 2~~3~~). This leakage rate, used in the evaluation of offsite doses resulting from accidents, is defined for Prairie Island in the Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J (Ref. 1),~~ as L_a: the maximum allowable containment leakage rate at the CL3.6-191

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~calculated peak~~ containment design maximum internal pressure (P_a) ~~resulting from the limiting DBA~~. The allowable leakage rate represented by L_a forms the basis for the acceptance criteria imposed on all containment leakage rate testing. L_a is assumed to be 0.25~~[0.1]~~% per day in the safety analysis at P_a = ~~[~~46.0~~3]~~ psig (Ref. 2~~3~~). CL3.6-192 CL3.6-193

Satisfactory leakage rate test results are a requirement for the establishment of containment OPERABILITY.

The containment satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

Containment OPERABILITY is maintained by limiting leakage to ≤ 1.0 L_a, except prior to the first startup after performing a required Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J,~~ leakage test. At this time, the applicable (more restrictive) leakage rates must be met~~combined Type B and C leakage must be < 0.6 L_a, and the overall Type A leakage must be < 0.75 L_a~~. CL3.6-102

Compliance with this LCO will ensure a containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

Individual leakage rates specified for the containment air lock (LCO 3.6.2) ~~[~~, purge valves with resilient seals, and secondary bypass leakage (LCO 3.6.3)~~]~~ are not specifically part of the acceptance criteria of 10 CFR 50, Appendix J. Therefore, leakage rates exceeding these individual limits only result in the containment being inoperable when the leakage results in exceeding the overall acceptance criteria of 1.0 L_a~~Appendix J~~. CL3.6-102

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material into containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, containment is not required to be

BASES

APPLICABILITY (continued)

OPERABLE in MODE 5 to prevent leakage of radioactive material from containment. The requirements for containment during MODE 6 are addressed in LCO 3.9.4, "Containment Penetrations."

ACTIONS

A.1

In the event containment is inoperable, 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 containment OPERABLE during MODES 1, 2, 3, and 4. This time period also ensures that the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal.

B.1 and B.2

If 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 6 hours and to MODE 5 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 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of ~~10 CFR 50, Appendix J (Ref. 1), as modified by approved exemptions as contained in~~ the Ccontainment Leakage Rate Testing Program. Failure to

CL3.6-102

BASES (continued)

meet air lock and~~[,~~ shield building~~secondary containment~~ bypass leakage path~~ and purge valve with resilient seal]~~ leakage limits specified in LCO 3.6.2 ~~[~~and LCO 3.6.3~~]~~ does not invalidate the acceptability of these overall leakage determinations unless their contribution to overall Type A, B, and C leakage causes that

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1 (continued)

to exceed limits. As left leakage prior to the first startup after performing a required Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J,~~ leakage test is required to be ≤~~<~~ 0.6 L_a for combined Type B and C leakage following an outage or shutdown that included Type B and C testing only, and ≤~~<~~ 0.75 L_a for overall Type A leakage following an outage or shutdown that included Type A testing. At all other times between required leakage rate tests, the acceptance criteria are~~is~~ based on an overall Type A leakage limit of ≤ 1.0 L_a. At ≤ 1.0 L_a the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leakage Rate Testing Program~~Appendix J, as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply~~. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis. CL3.6-101

CL3.6-102

~~SR 3.6.1.2~~

~~For ungrouted, post tensioned tendons, this SR ensures that the structural integrity of the containment will be maintained in accordance with the provisions of the Containment Tendon Surveillance Program. Testing and~~

~~Frequency are consistent with the recommendations of Regulatory Guide 1.35 (Ref. 4).~~

SR 3.6.1.2

CL3.6-103

Verifying that the maximum temperature differential between average containment and annulus air temperatures is less than or equal to 44 °F ensures that containment operation remains within the limits assumed for the containment analyses. Plant operating experience demonstrates that this limit can only be approached when the plant is in MODES 5 and 6. Requiring this temperature differential to be verified prior to entering MODE 4 from MODE 5 provides assurance this parameter is within acceptable limits prior to establishing conditions requiring containment integrity.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3

CL3.6-104

Verifying that the minimum containment shell temperature is met ensures that adequate margin above NDTT exists. Plant operating experience demonstrates that this limit can only be approached when the plant is in MODES 5 and 6. Requiring containment shell temperature to be verified prior to entering MODE 4 from MODE 5 provides assurance that the shell temperature is above NDTT prior to establishing conditions requiring containment integrity.

REFERENCES

1. 10 CFR 50, Appendix J, Option B.
2. UFSAR, Section ~~[~~14~~5]~~.
3. ~~FSAR, Section [6.2].~~
4. ~~Regulatory Guide 1.35, Revision [1].~~

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.2 Containment Air Locks ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

BASES

BACKGROUND

Containment air locks form part of the containment pressure boundary and provide a means for personnel access during all MODES of operation.

Each air lock is nominally a right circular cylinder, 10 ft in diameter, with a door at each end. The doors are interlocked to prevent simultaneous opening. During periods when containment is not required to be OPERABLE, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. 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 d~~D~~esign b~~B~~asis a~~A~~ccident (DBA) in containment. As such, closure of a single door supports containment OPERABILITY. Each of the doors contains double gasketed seals and local leakage rate testing capability to ensure pressure integrity. To effect a leak tight seal, the air lock design uses pressure seated doors (i.e., an increase in containment internal pressure results in increased sealing force on each door).

Each personnel air lock is provided with limit switches on both doors that provide control room indication of door position. ~~Additionally, control room indication is provided to alert the operator whenever an air lock door interlock mechanism is defeated.~~ CL3.6-194

The containment air locks form part of the containment pressure boundary. As such, air lock integrity and leak tightness is essential for maintaining the containment

(continued)

leakage rate within limit 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 unit safety analyses.

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident

BASES

APPLICABLE SAFETY ANALYSES (continued)

and a rod ejection accident (Ref. 1~~2~~). The LOCA dose analysis bounds the rod ejection accident releases. CL3.6-191 In the LOCA analysis ~~of each of these accidents~~, it is assumed that containment is OPERABLE such that release of fission products to the environment is controlled by the rate of containment leakage. The assumed containment ~~was designed with an allowable~~ leakage rate is ~~of~~ 0.25~~[0.1]~~% of containment air weight per day (Ref. 1~~2~~). This leakage rate is defined at Prairie Island in CL3.6-193 the Containment Leakage Rate Testing Program ~~10 CFR 50, Appendix J (Ref. 1),~~ as L_a ~~= [0.1]% of containment air weight per day~~, the maximum CL3.6-192 allowable containment leakage rate at the ~~calculated peak~~ containment internal design pressure P_a = ~~[~~46.0~~14.4]~~ psig ~~following a DBA~~. This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air locks.

The containment air locks satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

Each containment air lock forms part of the containment pressure boundary. As part of the containment pressure boundary, the air lock safety function is related to control

(continued)

of the containment leakage rate resulting from a DBA. Thus, each air lock's structural integrity and leak tightness are essential to the successful mitigation of such an event.

Each 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 10CFR50, Appendix J, Type B air lock leakage test, and both air lock doors must be OPERABLE. PA3.6-196 The interlock, including shaft seals and equalizing valve, or test ports, allows only one air lock door of an air lock to be opened at one time. This provision ensures that a gross breach of containment does not exist when containment is required to be OPERABLE. Closure of a single door in each air lock is 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 into PA3.6-197 or ~~and~~ exit from containment. Normal entry into or exit from containment does not render the air lock inoperable.

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment air locks are not required in MODE 5 to prevent leakage of radioactive material from containment. The requirements for the containment air locks during MODE 6 are addressed in LCO 3.9.4~~3~~, "Containment Penetrations."

(continued)

ACTIONS

The ACTIONS are modified by three Notes. The first~~a~~ Note ~~that~~ allows entry and exit to perform repairs on the affected air lock component. If the outer door is inoperable, then it may be easily accessed for most repairs. For repairs to the inner door, i~~I~~t is preferred that the air lock be accessed from inside primary containment by entering through the other OPERABLE air lock. However, if this is not practicable, or if repairs on either door must be performed from inside the air lock between the two doors~~the barrel side of the door~~ then it is permissible to enter the air lock through the OPERABLE door, which means there is a short time during which the containment boundary is not intact (during access through the OPERABLE door). The ability to open the OPERABLE door, even if it means the containment boundary is temporarily not intact, is acceptable due to the low probability of an event that could pressurize the containment during the short time in which the OPERABLE door is expected to be open. After each entry and exit, the OPERABLE door must be immediately closed. If ALARA conditions permit, entry and exit should be via an OPERABLE air lock.

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

In the event the air lock leakage results in exceeding the overall containment leakage rate, Note 3 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1, "Containment."

(continued)

BASES

ACTIONS (continued)

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

With one air lock door in one or more containment air locks inoperable, the OPERABLE door must be verified closed (Required Action A.1) in each affected containment air lock. This ensures that a leak tight containment barrier is maintained by the use of an OPERABLE air lock door. This action must be completed within 1 hour and may consist of verifying the control board alarm status for the air lock doors. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires containment be restored to OPERABLE status within 1 hour. PA3.6-201

In addition, the affected 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 reasonable for locking the OPERABLE air lock door, considering the OPERABLE door of the affected air lock is being maintained closed.

Required Action A.3 verifies that an air lock with an inoperable door has been isolated by the use of a locked and closed OPERABLE air lock door. This ensures that an acceptable containment leakage boundary is maintained. The Completion Time of once per 31 days is based on engineering judgment and is considered adequate in view of 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 and allows these doors to be verified locked closed by use of administrative means. Allowing verification by administrative means 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.

(continued)

Note 1 ensures that only the Required Actions and associated Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same 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

ACTIONS

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

entry and exit for 7 days under administrative controls if both air locks have an inoperable door. This 7 day restriction begins when the second air lock is discovered inoperable. Containment entry may be required on a periodic basis to perform Technical Specifications (TS) Surveillances and Required Actions, as well as other activities on equipment inside containment that are required by TS or activities on equipment that support TS-required equipment. This Note is not intended to preclude performing other activities (i.e., non-TS-required activities) if the containment is entered, using the inoperable air lock, to perform an allowed activity listed above. This allowance is acceptable due to the low probability of an event that could pressurize the 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 in one or more air locks, 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

(continued)

Completion Times of Condition C are required if both doors in the same air lock are inoperable. With both doors in the same 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 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 and allows these doors to be verified locked closed by use of administrative means. Allowing verification by administrative means 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.

BASES

PA3.6-202

ACTIONS (continued)

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

With one or more air locks inoperable for reasons other than those described in Condition A or B (e.g., both doors of an air lock are inoperable), Required Action C.1 requires action to be initiated immediately to evaluate previous combined leakage rates using current air lock test results. An evaluation per LCO 3.6.1 is acceptable, since it is overly conservative to immediately declare the containment inoperable if both doors in an air lock have failed a seal test or if the overall air lock leakage is not within the limits of SR 3.6.2.1. In many instances (e.g., only one seal per door has failed), containment remains OPERABLE, yet only 1 hour (per LCO 3.6.1) 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 due to the large margin between the air lock

(continued)

leakage and the containment overall leakage acceptance criteria.

Required Action C.2 requires that one door in the affected containment air lock must be verified to be closed within the 1 hour Completion Time. This specified time period is consistent with the ACTIONS of LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

Additionally, the affected air lock(s) must be restored to OPERABLE status within the 24 hour Completion Time. The specified time period is considered reasonable for restoring an inoperable air lock to OPERABLE status, assuming that at least one door is maintained closed in each affected air lock.

D.1 and D.2

If the inoperable containment air lock 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 6 hours and to MODE 5 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.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J (Ref. 1), as modified by approved exemptions~~. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during CL3.6-102

(continued)

initial air lock and containment OPERABILITY testing. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall containment leakage rate. The Frequency is required by the Containment Leakage Rate Testing Program~~Appendix J (Ref. 1), as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply~~.

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 requires the results of~~has been added to~~ this SR ~~requiring the results~~ to be evaluated against the acceptance criteria ~~of~~applicable to SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and ~~C~~~~overall~~ containment leakage rate. CL3.6-102

SR 3.6.2.2

The air lock interlock is designed to prevent simultaneous opening of both doors in a single air lock. Since both the inner and outer doors of an air lock are designed to withstand the maximum expected post accident containment pressure, closure of either door will support containment OPERABILITY. Thus, the door interlock feature supports 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 opening of the inner and outer doors will not inadvertently occur. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally~~only~~ challenged when the containment air lock door is used for entry and exit (procedures require strict adherence to single door TA3.6-107

BASES

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

TA3.6-107

opening) ~~opened~~, this test is only required to be performed ~~upon~~every 24 months. The 24 month Frequency accommodates the need to perform this Surveillance under the conditions that apply during a plant outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power. ~~entering or exiting a containment air lock but is not required more frequently than every 184 days.~~ This~~The 184 day~~ Frequency for the interlock SR is justified by~~based on~~ generic operating experience. 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 airlock~~in view of other indications of door and interlock mechanism status available to operations personnel~~.

REFERENCES

1. USAR, Chapter 14~~10 CFR 50, Appendix J~~.

~~2. FSAR, Section [6.2]~~.

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.3 Containment Isolation Valves ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

BASES

BACKGROUND

The containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on a containment isolation signal. These isolation devices are either passive or active (automatic). Manual valves, de-activated power operated~~automatic~~ valves secured in their closed position (including check valves with flow through the valve secured, i.e., flow stopped by the check valve), blind flanges, and closed systems are considered passive devices. ~~Check valves, or other~~ Aautomatic valves designed to close without operator action following an accident~~,~~ are considered active devices. Two barriers in series are provided for each penetration 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 which means it penetrates primary containment, is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere, and has a low probability of being ruptured by an accident (Refs. 1 and 2). These barriers (typically containment isolation valves) make up the Containment Isolation System.

PA3.6-125

PA3.6-203

CL3.6-204

PA3.6-206

The Containment Isolation System is designed to provide isolation capability following a design basis accident (DBA) for fluid lines which penetrate containment. Major nonessential lines (i.e., fluid systems

CL3.6-207

(continued)

which do not perform an immediate accident mitigation function) which penetrate containment, except for main steam lines, are either automatically isolated following an accident or are normally maintained closed in MODES 1, 2, 3, and 4. Automatic containment isolation valves are designed to close on a containment isolation signal which is generated by either an automatic safety injection (SI) signal or by manual actuation. The Containment Isolation System can also isolate essential lines at the discretion of the operators depending on the accident progression and mitigation requirements. CL3.6-207

~~Automatic isolation signals are produced during accident conditions. Containment Phase "A" isolation occurs upon receipt of a safety injection signal. The Phase "A"~~

BASES

BACKGROUND (continued)

~~isolation signal isolates nonessential process lines in order to minimize leakage of fission product radioactivity. Containment Phase "B" isolation occurs~~ ~~U~~upon receipt of a containment pressure High-High signal, both main steam isolation valves close which also causes the instrument air line to containment to isolate if a containment isolation signal is also present ~~and isolates the remaining process lines, except systems required for accident mitigation~~. In addition to the isolation signals listed above, the containment purge and inservice purge supply and exhaust line valves and dampers receive ~~an~~ isolation signals on a safety injection signal, a containment high radiation condition, a manual containment isolation actuation and manual containment spray initiation. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated from the outside environment in the event of a release of fission product radioactivity to the containment atmosphere resulting from ~~as a result of~~ a ~~Design Basis~~ CL3.6-207

(continued)

~~Accident (~~DBA~~)~~.

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the time limits assumed in the safety analyses. Therefore, the OPERABILITY requirements provide assurance that the containment function assumed in the safety analyses will be maintained.

In addition to the normal fluid systems which penetrate containment, two systems which can provide direct access from inside containment to the outside environment are described below. PA3.6-211

ContainmentShutdown Purge System (36[42] inch purge valves)

The Containment~~Shutdown~~ Purge System operates to supply outside air into the containment for ventilation and cooling or heating and may also be used to reduce the concentration of noble gases within containment prior to and during personnel access in MODES 5 and 6. The supply and exhaust lines each contain one~~two~~ isolation valve~~s~~, one isolation damper and a blind flange. ~~Because of their large size,~~ [~~t~~he 36~~[42]~~ inch purge valves and dampers ~~in some units~~ are not tested to verify their leakage rate is within the acceptance criteria of the Containment Leakage Rate Testing Program~~qualified for automatic closure from their open position under DBA conditions~~. Therefore, ~~the~~ blind flanges are CL3.6-212

BASES

BACKGROUND (continued)

installed~~[42] inch purge valves are normally maintained closed~~ in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained.

(continued)

Inservice Purge~~Minipurge~~ System (~~[18]~~ inch purge valves)

The Inservice Purge~~Minipurge~~ System operates to: CL3.6-212

a. Reduce the concentration of noble gases within containment prior to and during personnel access~~,~~ and

b. Provide low volume normal purge and ventilation~~Equalize internal and external pressures~~.

Two containment automatic isolation valves and an automatic Shield Building ventilation damper are provided on each supply and exhaust line. The supply and exhaust lines are designed to have blind flanges installed where the lines pass through the shield building annulus. Normally, during MODES 1, 2, 3, and 4 the blind flanges provide the containment penetration isolation function. When ventilation of containment is required in MODES 1, 2, 3, and 4, the valves will be leak tested, and the blind flanges removed and replaced with a spool piece. Prior to system use, the automatic isolation valves and dampers are verified to be OPERABLE and a debris screen is installed on each line to prevent foreign material from inhibiting the proper closing of the valves. When purge of containment is completed and inservice purge system operation is no longer required, the system is returned to its normal operating configuration with the spool pieces removed. The blind flanges are installed and tested to meet the acceptance criteria of the Containment Leakage Rate Testing Program.~~Since the valves used in the Minipurge System are designed to meet the requirements for automatic containment isolation valves, these valves may be opened as needed in MODES 1, 2, 3, and 4.~~ CL3.6-212

APPLICABLE SAFETY ANALYSES

The containment isolation valve LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory and establishing the

(continued)

containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness

BASES

APPLICABLE SAFETY ANALYSES (continued)

of the containment. Therefore, the safety analyses of any event requiring isolation of containment is applicable to this LCO.

The DBAs that result in a release of radioactive material to the ~~within~~ containment atmosphere are a loss of coolant accident (LOCA) and a rod ejection accident (Ref. 3~~1~~). In the analyses for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves ~~(including containment purge valves)~~ are minimized. The safety analyses assume that the 36~~[42]~~ inch purge lines are blind flanged~~valves are closed~~ at event initiation. CL3.6-112

In calculation of control room and offsite doses following a LOCA, the accident analyses assume that 25% of the equilibrium iodine inventory and 100% of the equilibrium noble gas inventory developed from maximum full power operation of the core is immediately available for leakage from containment (Ref. 3). The containment is assumed to leak at the maximum allowable leakage rate, L_a, for the first 24 hours of the accident and at 50% of this leakage rate for the remaining duration of the accident. CL3.6-191

The containment penetration isolation valves ensure that the containment leakage rate remains below L_a by automatically

(continued)

isolating penetrations that do not serve post accident functions and providing isolation capability for penetrations associated with Engineered Safety Features. The maximum isolation time for automatic containment isolation valves is 60 seconds. This isolation time is based on engineering judgement since the control room and offsite dose calculations are performed assuming that leakage from containment begins immediately following the accident with no credit for transport time or radioactive decay. The 60 second isolation time takes into consideration the time required to drain piping of fluid which can provide an initial containment isolation before the containment isolation valves are required to close and the conservative assumptions with respect to core damage occurring immediately following the accident. ~~The DBA analysis assumes that, within 60 seconds after the accident, isolation of the containment is complete and leakage terminated except for~~ CL3.6-191

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~the design leakage rate, L_a.~~ The containment isolation total response time of 60 seconds includes signal delay, diesel generator startup (for loss of offsite power), and containment isolation valve stroke times.

The containment inservice purge valves have been analyzed to demonstrate they are capable of closing during the design basis LOCA (Ref. 2). During plant operation, the containment inservice purge lines are normally blank flanged and the valves are not relied upon as penetration isolation barriers. CL3.6-191

Containment isolation also isolates the RCS to prevent the release of radioactive material. However, RCS isolation, not isolation of containment, is required for events which result in failed fuel and do not breach the integrity of the RCS (e.g., CL3.6-191

(continued)

reactor coolant pump locked rotor). The isolation of containment following these events also isolates the RCS from all non-essential systems to prevent the release of radioactive material outside the RCS. The containment isolation time requirements for these events are bounded by those for the LOCA. CL3.6-191

The Containment Isolation System is designed to provide two in series boundaries for each penetration such that no single credible failure or malfunction (expected fault condition) occurring in any active system component can result in loss of isolation or intolerable leakage in compliance with the AEC GDC 53, "Containment Isolation Valves," (Ref. 4). CL3.6-191

~~[The single failure criterion required to be imposed in the conduct of plant safety analyses was considered in the original design of the containment purge valves. Two valves in series on each purge line provide assurance that both the supply and exhaust lines could be isolated even if a single failure occurred. The inboard and outboard isolation valves on each line are provided with diverse power sources, motor operated and pneumatically operated spring closed, respectively. This arrangement was designed to preclude common mode failures from disabling both valves on a purge line.]~~

~~[The purge valves may be unable to close in the environment following a LOCA. Therefore, each of the purge valves is required to remain sealed closed during MODES 1, 2, 3, and 4. In this case, the single failure criterion remains applicable to the containment purge valves due to failure in~~

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~the control circuit associated with each valve. Again, the purge system valve design precludes a single failure from compromising the containment boundary as long as the system is operated in accordance with the subject LCO.]~~

(continued)

The containment isolation valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

Containment isolation valves form a part of the containment boundary. The containment isolation valves' safety function is related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during a DBA.

The containment isolation devices covered by this LCO consist of isolation valves (manual valves, check valves, air operated valves, and motor operated valves), pipe and end caps, closed systems, and blind flanges. PA3.6-213

Vent and drain valves located between two isolation devices are also containment isolation devices. A cap or blind flange, as applicable, must be installed on these vent and drain lines. A cap or blind flange installed is equivalent to a lock. However, a lock installed on the valve is not equivalent to a cap or blind flange. Therefore, the valve must be shut and the end capped or blind flanged to ensure that proper containment isolation is provided. PA3.6-214

The automatic power operated isolation valves are required to have isolation times within limits and to actuate on an automatic isolation signal. The 36~~[42]~~ inch purge valves must be blind flanged in MODES 1, 2, 3, and 4~~maintained sealed closed [or have blocks installed to prevent full opening]~~. ~~[Blocked purge valves also actuate on an automatic signal.]~~ The valves covered by this LCO are listed in Reference 2~~along with their associated stroke times in the FSAR (Ref. 2)~~. CL3.6-112

The normally closed isolation valves are considered OPERABLE when manual valves are closed, non- PA3.6-125

(continued)

automatic power operated valves are de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact. These passive isolation valves/devices are those listed in Reference 2~~1~~. PA3.6-125

BASES

LCO (continued)

~~Purge valves with resilient seals [and secondary containment bypass valves] must meet additional leakage rate requirements.~~ The ~~other~~ containment isolation valve leakage rates are addressed by LCO 3.6.1, "Containment," as Type C testing.

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

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the containment isolation valves are not required to be OPERABLE in MODE 5. The requirements for containment isolation valves during MODE 6 are addressed in LCO 3.9.4, "Containment Penetrations."

ACTIONS

The ACTIONS are modified by four Notes. The first~~a~~ Note allows~~ing~~ penetration flow paths, except for 36~~[42]~~ inch containment purge system~~valve~~ penetration flow paths, to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous PA3.6-114

(continued)

communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated. Due to the blind flanges on ~~size of~~ the containment purge system lines during plant operation ~~line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment~~, the penetration flow path containing these flanges ~~valves~~ may not be opened under administrative controls. ~~A single purge valve in a penetration flow path may be opened to effect repairs to an inoperable valve, as allowed by SR 3.6.3.1.~~ CL3.6-112

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each

BASES

ACTIONS (continued)

penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment isolation valve. Complying with the Required Actions may allow for continued operation, and subsequent inoperable containment isolation valves are governed by subsequent Condition entry and application of associated Required Actions.

The ACTIONS are further modified by a third Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable containment isolation valve.

In the event containment isolation valve ~~the air lock~~ leakage results in exceeding the overall containment leakage rate acceptance criteria, Note 4 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1. PA3.6-216

(continued)

A.1 and A.2

In the event one containment isolation valve in one or more penetration flow paths is inoperable~~[except for purge valve or shield building bypass leakage not within limit]~~, 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 or mechanically blocked power operated~~automatic~~ containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. Bases B 3.6.8 provide further guidance if the vacuum breaker flow path has an inoperable isolation valve. For a penetration flow path isolated in accordance with Required Action A.1, the device used to isolate the penetration should be the closest available one to containment. Required Action A.1 must be completed within 4 hours. The 4 hour Completion Time is reasonable, considering the time required to isolate the penetration and the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, and 4.

PA3.6-121

PA3.6-117

PA3.6-125

PA3.6-217

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and

BASES

ACTIONS

A.1 and A.2 (continued)

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

(continued)

position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. The Completion Time of "once per 31 days for isolation devices outside containment" is appropriate considering the fact that the devices are operated under administrative controls and the probability of their misalignment is low. For the isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.

Condition A has been modified by a Note indicating that this Condition is only applicable to those penetration flow paths which do not use a closed system as a~~with two~~ containment isolation barrier~~valves~~. For penetration flow paths which do use~~with only one containment isolation valve and~~ a closed system, Condition C provides the appropriate actions. PA3.6-116

Required Action A.2 is modified by two~~a~~ Notes. ~~that~~ Note 1 applies to isolation devices located in high radiation areas and allows these devices to be verified closed 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 of these devices once they have TA3.6-119

(continued)

been verified to be in the proper position, is small.

BASES

ACTIONS (continued)

B.1

With two containment isolation valves in one or more penetration flow paths inoperable, the 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 power operated~~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. In the event the affected penetration is isolated in accordance with Required Action B.1, the affected penetration must be verified to be isolated on a periodic basis per Required Action A.2, which remains in effect. This periodic verification is necessary to assure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of once per 31 days for verifying each affected penetration flow path is isolated is appropriate considering the fact that the valves are operated under administrative control and the probability of their misalignment is low. PA3.6-125

BASES

ACTIONS

B.1 (continued)

PA3.6-116

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths

(continued)

which do not use a closed system as a~~with two~~ containment isolation barrier~~valves~~. Condition A of this LCO addresses the condition of one containment isolation valve inoperable in this type of penetration flow path.

C.1 and C.2

With one or more penetration flow paths with one containment isolation valve inoperable, the inoperable valve flow path 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 power operated~~automatic~~ valve, a closed manual valve, and a blind flange. With the exception of the CVCS, a~~A~~ check valve may not be used to isolate the affected penetration flow path. Required Action C.1 must be completed within the 72~~[4]~~ hour Completion Time. The specified time period is reasonable considering the relative stability of the closed system (hence, reliability) to act as a penetration isolation boundary and the relative importance of maintaining containment integrity during MODES 1, 2, 3, and 4. In the event the affected penetration flow path is isolated in accordance with Required Action C.1, the affected penetration flow path must be verified to be isolated on a periodic basis. This periodic verification is necessary to

PA3.6-125

CL3.6-221

TA3.6-122

BASES

ACTIONS

C.1 and C.2 (continued)

assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. This

PA3.6-222

(continued)

required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment and capable of being mispositioned are in the correct position. The Completion Time of once per 31 days for verifying that each affected penetration flow path is isolated is appropriate because the valves are operated under administrative controls and the probability of their misalignment is low. PA3.6-222

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths which use ~~with only one containment isolation valve and~~ a closed system. This Note is necessary since this Condition is written to specifically address those penetration flow paths in a closed system as defined in Reference 2. PA3.6-116

Required Action C.2 is modified by two ~~a~~ Notes. ~~that~~ Note 1 applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed 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 of these valves, once they have been verified to be in the proper position, is small. TA3.6-119

(continued)

~~D.1~~

~~With the shield building bypass leakage rate not within limit, the assumptions of the safety analyses are not met. Therefore, the leakage must be restored to within limit within 4 hours. Restoration can be accomplished by isolating the penetration(s) that caused the limit to be~~ PA3.6-124

BASES

~~ACTIONS~~

~~D.1 (continued)~~

~~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 4 hour Completion Time is reasonable considering the time required to restore the leakage by isolating the penetration(s) and the relative importance of secondary containment bypass leakage to the overall containment function.~~

~~E.1, E.2, and E.3~~

~~In the event one or more containment purge valves in one or more penetration flow paths are not within the purge valve leakage limits, purge valve leakage must be restored to within limits, or the affected penetration flow path must be isolated. The method of isolation must be by 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, closed manual~~ PA3.6-126

(continued)

~~valve, or blind flange]. A purge valve with resilient seals utilized to satisfy Required Action E.1 must have been demonstrated to meet the leakage requirements of SR 3.6.3.7. The specified Completion Time is reasonable, considering that one containment purge valve remains closed so that a gross breach of containment does not exist.~~

PA3.6-126

~~In accordance with Required Action E.2, this penetration flow path must be verified to be isolated on a periodic basis. The periodic verification is necessary to ensure that containment penetrations required to be isolated following an accident, which are no longer capable of being automatically isolated, will be in the isolation position should an event occur. This Required Action does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those isolation devices outside containment capable of being mispositioned are in the correct position. For the~~

BASES

~~ACTIONS~~

~~E.1, E.2, and E.3 (continued)~~

~~isolation devices inside containment, the time period specified as "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is based on engineering judgment and is considered reasonable in view of the inaccessibility of the isolation devices and other administrative controls that will ensure that isolation device misalignment is an unlikely possibility.~~

~~For the containment purge valve with resilient seal that is isolated in accordance with Required Action E.1, SR 3.6.3.7 must be performed at least once every [92] days. This assures that degradation of the resilient seal is detected and confirms that the leakage rate of the containment purge valve does not increase during the time the penetration is isolated. The normal Frequency for SR 3.6.3.7, 184 days, is based on an NRC initiative, Generic Issue B-20 (Ref. 3).~~

(continued)

~~Since more reliance is placed on a single valve while in this Condition, it is prudent to perform the SR more often. Therefore, a Frequency of once per [92] days was chosen and has been shown to be acceptable based on operating experience.~~

DE.1 and DE.2

If the Required Actions and associated Completion Times are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 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.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each 36~~[42]~~ inch containment purge system penetration ~~valve~~ is required to be blind flanged when the plant is in MODES 1, 2, 3, and 4 ~~verified sealed closed at 31 day intervals~~. This Surveillance is designed to ensure that the blind flange is installed prior to entering MODE 4 from MODE 5 ~~a gross breach of containment is not caused by an inadvertent or spurious opening of a containment purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A containment purge valve that~~

CL3.6-127

(continued)

~~is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator. In this application, the term "sealed" has no connotation of leak tightness. The Frequency is a result of an NRC initiative, Generic Issue B-24 (Ref. 4), related to containment purge valve use during plant operations. In the event purge valve leakage requires entry into Condition E, the Surveillance permits opening one purge valve in a penetration flow path to perform repairs.~~

SR 3.6.3.2

CL3.6-131

This SR ensures that the 18-inch containment inservice purge penetrations~~minipurge valves~~ are blind flanged after each use of the system~~closed as required or, if open, open for an allowable reason~~. Since the inservice purge penetration blind flanges are part of the containment boundary, they are required to meet the Containment Leakage Rate Testing Program acceptance criteria required by SR 3.6.1.1 as required by this SR~~If a purge valve is open in violation of this SR, the valve is considered inoperable~~. ~~If the inoperable valve is not otherwise known to have excessive leakage when closed, it is not considered to have leakage outside of limits. The SR is not required to be met when the minipurge valves are open for the reasons stated. The valves may be opened for pressure control, ALARA or air quality considerations for personnel entry, or for Surveillances that require the valves to be open. The minipurge valves are capable of closing in the environment~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2 (continued)

(continued)

~~following a LOCA. Therefore, these valves are allowed to be open for limited periods of time. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.3.~~

SR 3.6.3.3

This SR requires verification that each containment isolation manual valve and blind flange located outside containment and not locked, sealed, or otherwise secured and 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 containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment manual valves and blind flanges~~isolation valves~~ outside containment and capable of being mispositioned are in the correct position. Since verification of manual valve and blind flange position for containment isolation valves outside containment is relatively easy, the 92~~31~~ day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The SR specifies that containment isolation manual valves and blind flanges~~isolation valves~~ that are open under administrative controls are not required to meet the SR during the time the valves are open. 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.

TA3.6-132

PA3.6-223

X3.6-123

TA3.6-132

The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically

(continued)

restricted during MODES 1, 2, 3 and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is small.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.4

This SR requires verification that each containment isolation manual valve and blind flange located inside containment and not locked, sealed, or otherwise secured and 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 containment boundary is within design limits. For containment isolation manual valves and blind flanges inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation manual valves and blind flanges that are open under administrative controls are not required to meet the SR during the time they are open. 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.

TA3.6-132

PA3.6-223

TA3.6-132

This Note allows valves and blind flanges located in high radiation areas to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted~~during MODES 1, 2, 3, and 4, for ALARA reasons~~.

PA3.6-224

(continued)

Therefore, the probability of misalignment of these containment isolation valves or blind flanges, once they have been verified to be in their proper position, is small. PA3.6-223

SR 3.6.3.5

Verifying that the isolation time of each ~~power operated and~~ automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time test ensures the valve will isolate in a time period less than or equal to that assumed in the safety analyses. ~~[~~The isolation time and Frequency of this SR are in accordance with the Inservice Testing Program ~~or 92 days~~.~~]~~ TA3.6-134

BASES

~~SURVEILLANCE REQUIREMENTS (continued)~~

~~SR 3.6.3.6~~

~~In subatmospheric containments, the check valves that serve a containment isolation function are weight or spring loaded to provide positive closure in the direction of flow. This ensures that these check valves will remain closed when the inside containment atmosphere returns to subatmospheric conditions following a DBA. SR 3.6.3.6 requires verification of the operation of the check valves that are testable during unit operation. The Frequency of 92 days is consistent with the Inservice Testing Program requirement for valve testing on a 92 day Frequency.~~ CL3.6-136

SR 3.6.3.6~~7~~

(continued)

~~For containment purge valves with resilient seals, additional leakage rate testing beyond the test requirements of 10 CFR 50, Appendix J, is required to ensure OPERABILITY. Operating experience has demonstrated that this type of seal has the potential to degrade in a shorter time period than do other seal types. Based on this observation and the importance of maintaining this penetration leak tight (due to the direct path between containment and the environment), a Frequency of 184 days was established as part of the NRC resolution of Generic Issue B-20, "Containment Leakage Due to Seal Deterioration" (Ref. 3).~~

Since PI only uses the containment inservice purge system infrequently for short periods of time~~Additionally~~, this SR must be performed prior to each use of the system when containment integrity is required to assure that the valve leakage rate is within an acceptable value~~within 92 days after opening the valve~~. ~~The 92 day Frequency was chosen recognizing that cycling the valve could introduce additional seal degradation (beyond that occurring to a valve that has not been opened). Thus, decreasing the interval (from 184 days) is a prudent measure after a valve has been opened.~~ CL3.6-137

SR 3.6.3.~~7~~8

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following a DBA. This SR ensures that each automatic containment isolation valve

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.~~7~~8 (continued)

will actuate to its isolation position on a containment isolation signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the

(continued)

required position under administrative controls. The 24 ~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass this Surveillance when performed ~~at the [18] month Frequency~~. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. CL3.6-141

~~SR 3.6.3.9~~ CL3.6-136

~~In subatmospheric containments, the check valves that serve a containment isolation function are weight or spring loaded to provide positive closure in the direction of flow. This ensures that these check valves will remain closed when the inside containment atmosphere returns to subatmospheric conditions following a DBA. SR 3.6.3.9 verifies the operation of the check valves that are not testable during unit operation. The Frequency of 18 months is based on such factors as the inaccessibility of these valves, the fact that the unit must be shut down to perform the tests, and the successful results of the tests on an 18 month basis during past unit operation.~~

~~SR 3.6.3.10~~ CL3.6-142

~~Reviewer's Note: This SR is only required for those units with resilient seal purge valves allowed to be open during [MODE 1, 2, 3, or 4] and having blocking devices on the valves that are not permanently installed.~~

~~Verifying that each [42] inch containment purge valve is blocked to restrict opening to ≤ [50]% is required to ensure that the valves can close under DBA conditions within~~

(continued)

~~the times assumed in the analyses of References 1 and 2. If a LOCA occurs, the purge valves must close to maintain containment leakage within the values assumed in the~~

BASES

~~SURVEILLANCE REQUIREMENTS~~

~~SR 3.6.3.10 (continued)~~

CL3.6-142

~~accident analysis. At other times when purge valves are required to be capable of closing (e.g., during movement of irradiated fuel assemblies), pressurization concerns are not present, thus the purge valves can be fully open. The 18 month Frequency is appropriate because the blocking devices are typically removed only during a refueling outage.~~

SR 3.6.3.8~~11~~

This SR ensures that the combined leakage rate of all shield building bypass leakage paths is less than or equal to the specified leakage rate. This provides assurance that the assumptions in the safety analysis are met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worse of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, closed manual valve, or blind flange. In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. 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 maximum pathway leakage is only to be used for this SR (i.e., Appendix J maximum pathway leakage limits are to be quantified in accordance with Appendix J).~~ The acceptance criteria and Frequency are provided~~is required~~ by the Containment Leakage Rate Testing Program~~10 CFR 50, Appendix J, as modified by approved exemptions (and therefore, the~~ CL3.6-102

(continued)

~~Frequency extensions of SR 3.0.2 may not be applied), since the testing is an Appendix J, Type C test. This SR simply imposes additional acceptance criteria~~.

~~[~~Bypass leakage is considered part of L_a. ~~[Reviewer's Note: Unless specifically exempted].]~~

BASES (continued)

REFERENCES

1. 10CFR50 Appendix A~~FSAR, Section [15]~~.

2. U~~F~~SAR, Section 5.2~~[6.2]~~.

3. USAR, Section 14~~Generic Issue B-20, "Containment Leakage Due to Seal Deterioration."~~

4. AEC "General Design Criteria for Nuclear Power Plant Construction Permits," Criteria 53, issued for comment July 10, 1967 as referenced in USAR Section 1.2~~Generic Issue B-24~~.

(continued)

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.4~~A~~ Containment Pressure ~~(Atmospheric, Dual, and Ice Condenser)~~

BASES

BACKGROUND

The containment pressure is limited during normal operation to preserve the initial conditions assumed in the accident analyses for a loss of coolant accident (LOCA) or steam line break (SLB). ~~These limits also prevent the containment pressure from exceeding the containment design negative pressure differential with respect to the outside atmosphere in the event of inadvertent actuation of the Containment Spray System.~~ CL3.6-143

Containment pressure is a process variable that is monitored and controlled. The containment pressure limits are derived from the input conditions used in the containment ~~functional~~ analyses ~~and the containment structure external pressure analysis~~. Should operation occur outside this~~these~~ limits coincident with a Loss of Coolant Accident (LOCA) or Steamline Break (SLB) ~~Design Basis Accident (DBA)~~, post accident containment pressures could exceed calculated values. PA3.6-227

APPLICABLE SAFETY ANALYSES

Containment internal pressure is an initial condition used in the LOCA and SLB ~~DBA~~ analyses to establish the maximum peak containment internal pressure. The limiting events ~~DBAs~~ considered, relative to containment pressure, are the LOCA and SLB, which are analyzed using computer pressure models ~~transients~~. The worst case SLB ~~LOCA~~ generates larger mass and energy release than the worst case LOCA ~~SLB~~. Thus, the SLB ~~LOCA~~ event bounds the LOCA ~~SLB~~ event from the containment peak pressure standpoint (Ref. 1).

(continued)

The initial pressure condition used in the containment analysis was 16.7~~[17.7]~~ psia (2.0~~[3.0]~~ psig). This resulted in a maximum peak pressure from a SLB~~LOCA~~ of less than 46~~[53.9]~~ psig. The containment analyses~~analysis (Ref. 1)~~ show~~s~~ that the maximum peak calculated containment pressure~~, P_a,~~ results from the SLB~~limiting LOCA~~. The maximum containment pressure resulting from the SLB~~worst case LOCA, [44.1] psig,~~ does not exceed the containment design maximum internal pressure, 46~~[55]~~ psig.

CL3.6-191

CL3.6-192

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~The containment was also designed for an external pressure load equivalent to [-2.5] psig. The inadvertent actuation of the Containment Spray System was analyzed to determine the resulting reduction in containment pressure. The initial pressure condition used in this analysis was [-0.3] psig. This resulted in a minimum pressure inside containment of [-2.0] psig, which is less than the design load.~~

CL3.6-143

~~For certain aspects of transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the cooling effectiveness of the Emergency Core Cooling System during the core reflood phase of a LOCA analysis increases with increasing containment backpressure. Therefore, for the reflood phase, the containment backpressure is calculated in a manner designed to conservatively minimize, rather than maximize, the containment pressure response in accordance with 10 CFR 50, Appendix K (Ref. 2).~~

Containment pressure satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

(continued)

LCO

Maintaining containment pressure at less than or equal to the LCO upper pressure limit ensures that, in the event of a LOCA or SLB~~DBA~~, the resultant peak containment accident pressure will remain below the containment design maximum internal pressure. ~~Maintaining containment pressure at greater than or equal to the LCO lower pressure limit ensures that the containment will not exceed the design negative differential pressure following the inadvertent actuation of the Containment Spray System.~~ PA3.6-227 CL3.6-143

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. Since maintaining containment pressure within limits is essential to ensure initial conditions assumed in the accident analyses are maintained, the LCO is applicable in MODES 1, 2, 3 and 4.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature

BASES

APPLICABILITY (continued)

limitations of these MODES. Therefore, maintaining containment pressure within the limits of the LCO is not required in MODE 5 or 6.

ACTIONS

A.1

When containment pressure is not within the limits of the LCO, it must be restored to within these limits within 8~~1~~ hours. The Required Action is necessary to return operation to within the bounds of the containment CL3.6-144

(continued)

analysis. The 8~~1~~ hour Completion Time is greater than~~consistent with~~ the ACTIONS of LCO 3.6.1, "Containment," which requires that containment be restored to OPERABLE status within 1 hour. However, due to the large containment free volume and limited size of the post-LOCA vent system, 8 hours is allowed to restore containment pressure to within limits. This is justified by the low probability of a DBA during this time period. CL3.6-144

B.1 and B.2

If containment pressure 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 6 hours and to MODE 5 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 3.6.4~~A~~.1

Verifying that containment pressure is within limits ensures that unit operation remains within the limits assumed in the containment analysis. The 12 hour Frequency of this SR was developed based on operating experience related to trending of containment pressure variations during the applicable MODES. Furthermore, the 12 hour Frequency is considered

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4~~A~~.1 (continued)

(continued)

adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment pressure condition.

REFERENCES	1. UFSAR, Section 14.5 ~~[6.2]~~.
	~~2. 10 CFR 50, Appendix K.~~

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.5~~6A~~ Containment Spray and Cooling Systems ~~(Atmospheric and Dual)~~
~~(Credit taken for iodine removal by the Containment Spray System)~~

BASES

BACKGROUND

The Containment Spray and Containment Cooling systems provide containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. Reduction of containment pressure and the iodine removal capability of the spray reduces the release of fission product radioactivity from containment to the environment, in the event of a d~~D~~esign b~~B~~asis a~~A~~ccident (DBA), to within limits. The Containment Spray and Containment Cooling systems are designed, as described in the USAR, to meet the requirements of AEC ~~10 CFR 50, Appendix A,~~ GDC 37, "Engineered Safety Features Basis for Design," GDC 38, "Reliability and Testing of Engineered Safety Features," GDC 41, "Engineered Safety Features Performance Capability," GDC 42, "Engineered Safety Features Components Capability," GDC 49, "Containment Design Basis," GDC 52~~38~~, "Containment Heat Removal Systems," GDC 58~~39~~, "Inspection of Containment Pressure-Reducing ~~Heat Removal~~ Systems," GDC 59~~40~~, "Testing of Containment Pressure-Reducing ~~Heat Removal~~ Systems," GDC 60~~41~~, "Testing of Containment Spray Systems ~~Atmosphere Cleanup~~," and GDC 61~~42~~, "Testing of Operational Sequence ~~Inspection~~ of Containment Pressure-Reducing ~~Atmosphere Cleanup~~ Systems," ~~and GDC 43, "Testing of Containment Atmosphere Cleanup Systems"~~ (Ref. 1)~~, or other documents that were appropriate at the time of licensing (identified on a unit specific basis)~~. CL3.6-231

The Containment Cooling System and Containment Spray System are Engineered Safety Feature (ESF) systems. They are designed to ensure that the heat removal capability required during the post accident period can be attained. ~~The~~

(continued)

~~Containment Spray System and the Containment Cooling System~~

BASES

BACKROUND (continued)

~~provide redundant methods to limit and maintain post accident conditions to less than the containment design values.~~ CL3.6-232

Containment Spray System

The Containment Spray System consists of two separate trains of equal capacity, each capable of meeting the design bases.

Each train includes a containment spray pump, spray headers, nozzles, valves, and piping. Each train is powered from a separate ESF bus. The refueling water storage tank (RWST) supplies borated water to the Containment Spray System during the injection phase of a DBA~~operation~~. ~~In the recirculation mode of operation, containment spray pump suction is transferred from the RWST to the containment sump(s).~~ CL3.6-233

The Containment Spray System provides a spray of cold borated water mixed with sodium hydroxide (NaOH) from the spray additive tank into the upper regions of containment to reduce the containment pressure and temperature and to remove~~reduce~~ fission products from the containment atmosphere during a DBA. The RWST solution temperature is an important factor in determining the heat removal capability of the Containment Spray System~~during the injection phase~~.~~In the recirculation mode of operation, heat is removed from the containment sump water by the residual heat removal coolers~~. CL3.6-233 Each train of the Containment Spray System provides adequate spray coverage to provide 100% of the Containment Spray~~meet the~~ S~~s~~ystem design requirements for containment heat removal. CL3.6-234

The Spray Additive System mixes~~injects~~ an NaOH CL3.6-236

(continued)

solution into the spray. The resulting alkaline pH of the spray enhances the ability of the spray to scavenge fission products from the containment atmosphere. The NaOH added in the spray

BASES

BACKROUND

Containment Spray System (continued)

also ensures an alkaline pH for the solution recirculated in the containment sump. Controlling t~~T~~he alkaline pH of the containment sump water minimizes the evolution of iodine and minimizes the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to the fluid.

The Containment Spray System is actuated either automatically by a containment High-High~~-3~~ pressure signal or manually. An automatic actuation signal opens the containment spray pump discharge valves, opens the Spray Additive System valves, starts the two containment spray pumps, and begins ~~the~~ injection ~~phase~~. A manual actuation of the Containment Spray System requires the operator to simultaneously actuate two separate switches on the main control board to begin the same sequence. The spray injection ~~phase~~ continues until containment pressure is reduced to less than 18 psig or an RWST level Low-Low alarm is received. When one of these conditions is reached, containment spray is manually terminated. ~~The Low-Low level alarm for the RWST actuates valves to align the Containment Spray System pump suction with the containment sump and/or signals the operator to manually align the system to the recirculation mode. The Containment Spray System in the recirculation mode maintains an equilibrium temperature between the containment atmosphere and the recirculated sump water. Operation of the Containment Spray System in the recirculation mode is controlled by the operator in accordance with the emergency operating procedures.~~

CL3.6-237

CL3.6-233

(continued)

Due to the nature of the containment spray system, most functional tests are performed with the isolation valves in the spray supply lines at containment and the spray additive tank isolation valves blocked closed. The tests are considered satisfactory if visual observations indicate all components have operated satisfactorily. CL3.6-241

BASES

BACKROUND

Containment Cooling System

Two trains of containment cooling, each of sufficient capacity to supply 100% of the Containment Cooling System design cooling requirements, are provided. Each train of two fan coil units is normally supplied with chilled water during summer operation or cooling water from ~~a~~ separate trains of the Cooling Water System (CL) for winter or emergency operation ~~essential service water (ESW)~~. Air is drawn into the coolers through the fan and discharged to the containment atmosphere including various compartments (e.g., steam generator and ~~compartments,~~ pressurizer compartments)~~, and instrument tunnel, and outside the secondary shield in the lower areas of containment~~. CL3.6-242

During normal operation, all four fan coil units are operating. The fans may be ~~are normally~~ operated at high or low speed with chilled water (summer operation) or CL water ~~ESW~~ supplied to the cooling coils. The Containment Cooling System~~, operating in conjunction with the Containment Ventilation and Air Conditioning systems,~~ is designed to limit the ambient containment air temperature during normal unit operation to less than 120°F ~~the limit specified in LCO 3.6.5A, "Containment Air Temperature."~~ This temperature limitation ensures that the containment temperature does not exceed the initial temperature conditions assumed for the DBAs. CL3.6-242

In post accident operation following an actuation signal,

(continued)

the Containment Cooling System fans are designed to start automatically in slow speed if not already running. If running in high~~(normal)~~ speed, the fans automatically shift to slow speed. The fans are operated at the lower speed during accident conditions to prevent motor overload from the higher mass atmosphere. The temperature of the cooling water~~ESW~~ is an important factor in the heat removal capability of the fan coil units. CL3.6-243

BASES (continued)

APPLICABLE SAFETY ANALYSES

The Containment Spray System and Containment Cooling System limit the temperature and pressure that could be experienced following a loss of coolant accident (LOCA) or steam line break (SLB)~~DBA~~. ~~The limiting DBAs considered are the loss of coolant accident (LOCA) and the steam line break (SLB).~~ The LOCA and SLB are analyzed using computer codes designed to predict the resultant containment pressure and temperature transients. These events~~No DBAs~~ are not assumed to occur simultaneously or consecutively. These postulated events~~DBAs~~ are analyzed with regard to containment ESF systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train of the Containment Spray System and Containment Cooling System being rendered inoperable. CL3.6-227

The analyses~~analysis~~ and evaluations show that under the worst case scenario, the highest peak containment pressure is less than 46~~[44.1]~~ psig ~~(experienced during a LOCA)~~. The analyses~~analysis~~ shows that the peak containment temperature ~~is [384.5]°F (experienced during an SLB). Both results~~ meets the intent of the design basis. ~~(See the Bases for LCO 3.6.4A, "Containment Pressure," and LCO 3.6.5A for a detailed discussion.)~~ The analyses and evaluations assume a conservative unit specific power level for the accident under consideration (LOCA or SLB)~~of [100]%~~, one containment spray train and one containment cooling train operating, and conservative initial (pre-accident) containment CL3.6-191

(continued)

pressure ~~conditions~~ of ~~[120]°F and~~ 2.0 ~~[1.5]~~ psig. The analyses also assume a response time delayed initiation to provide conservative peak calculated containment pressure and temperature responses.

For certain aspects of transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the effectiveness of the Emergency Core Cooling System during the core reflood phase of a LOCA analysis increases with increasing containment backpressure. For these calculations, the containment

BASES

APPLICABLE SAFETY ANALYSES (continued)

backpressure is calculated in a manner designed to conservatively minimize, rather than maximize, the calculated transient containment pressures in accordance with 10 CFR 50, Appendix K ~~(Ref. 2)~~.

The effect of an inadvertent containment spray actuation has been analyzed. An inadvertent spray actuation results in a ~~[2.0] psig~~ containment pressure reduction ~~and is~~ associated with the sudden cooling effect in the interior of the leak tight containment. Additional discussion is provided in the Bases for LCO 3.6.8 ~~4A~~.

CL3.6-237

The modeled Containment Spray System actuation from the containment analysis is based on a response time associated with exceeding the containment High-High ~~3~~ pressure setpoint to achieving full flow through the containment spray nozzles.

CL3.6-191

The analyses of the Main Steam Line Break (MSLB) and LOCA incorporated delays in Containment Spray actuation to account for load restoration ~~The Containment Spray System total response time of [60] seconds includes diesel generator (DG) startup (for loss of offsite power), block loading of equipment~~, discharge valve opening, containment spray pump windup ~~startup~~, and spray line filling (Ref. 3).

(continued)

Containment cooling train performance for post accident conditions is given in Reference 4. The result of the analyses~~analysis~~ is that one~~each~~ train of containment cooling with one train of containment spray can provide 100% of the required peak cooling capacity during ~~the~~ post accident conditions. The train post accident cooling capacity under varying containment ambient conditions, required to perform the accident analyses, is also shown in Reference 5. CL3.6-191

The modeled Containment Cooling System actuation from the

BASES

APPLICABLE

containment analysis is based upon a response time associated with receiving a safety injection (SI) signal ~~exceeding the containment High-3 pressure setpoint~~ to achieving full Containment Cooling System air and safety grade cooling water flow. The Containment Cooling System total response time incorporates delays to account for load restoration and motor windup ~~of [60] seconds, includes signal delay, DG startup (for loss of offsite power), and service water pumpstartup times~~ (Ref. 3~~6~~). CL3.6-191

The Containment Spray System and the Containment Cooling System satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

During a LOCA or SLB~~DBA~~, a minimum of one containment cooling train and one containment spray train are required to maintain the containment peak pressure and temperature below the design limits (Ref. 4~~7~~). Additionally, one containment spray train is also required to remove iodine from the containment atmosphere and thereby maintain concentrations below those assumed in the safety analysis. To ensure that these requirements are met, two containment spray trains and two containment cooling trains must be OPERABLE. Therefore, in the event of an accident, CL3.6-227

(continued)

at least one train in each system operates, assuming the worst case single active failure occurs.

Each Containment Spray System ~~typically~~ includes a spray pump, spray headers, nozzles, valves, piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST upon a~~n~~ containment spray~~ESF~~ actuation signal ~~and automatically transferring suction to the containment sump~~. Manual valves in this system that could, if improperly positioned, reduce the spray flow below that assumed for accident analysis, are blocked and tagged in the proper position and maintained under administrative CL3.6-244

BASES

LCO (continued)

control. Containment spray system motor operated valves MV-32096 and MV-32097 (Unit 1), and MV-32108 and MV-32109 (Unit 2) are closed with the motor control center supply breakers in the off position.

Each Containment Cooling System typically includes ~~demisters,~~ cooling coils, dampers, fans, ~~instruments,~~ and controls to ensure an OPERABLE flow path.

APPLICABILITY

In MODES 1, 2, 3, and 4, a LOCA or SLB~~DBA~~ could cause a release of radioactive material to containment and an increase in containment pressure and temperature requiring the operation of the containment spray trains and containment cooling trains. CL3.6-227

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, the Containment Spray System and the Containment Cooling System are not required to be OPERABLE in MODES 5 and 6.

(continued)

ACTIONS

A.1

PA3.6-246

With one containment spray train inoperable, the inoperable containment spray train must be restored to OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE spray and cooling trains are adequate to perform the iodine removal and containment cooling functions. The 72 hour Completion Time takes into account the redundant heat removal capability afforded by the other Containment Spray train~~System~~, reasonable time for repairs, and low probability of a LOCA or SLB~~DBA~~ occurring during this period.

CL3.6-227

~~The 10 day portion of the Completion Time for Required~~

BASES

ACTIONS (continued)

CL3.6-147

~~Action A.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this Specification coupled with the low probability of an accident occurring during this time. Refer to Section 1.3, "Completion Times," for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.~~

B.1 and B.2

If the inoperable containment spray train 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 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without

(continued)

challenging plant systems. The extended interval to reach MODE 5 allows an additional 48 hours ~~time~~ for attempting restoration of the containment spray train in MODE 3 and 36 hours to reach MODE 5 and is reasonable when considering the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

C.1

With one of the ~~required~~ containment cooling trains inoperable, the inoperable ~~required~~ containment cooling train must be restored to OPERABLE status within 7 days. ~~The components [i~~ In this degraded condition the remaining OPERABLE containment spray and cooling trains provide iodine removal capabilities and are capable of providing at least 100% of the heat removal needs. The 7 day Completion Time

CL3.6-151

PA3.6-247

BASES

ACTIONS

C.1 (continued)

was developed taking into account the ~~redundant~~ heat removal capabilities afforded by combinations of the Containment Spray System and Containment Cooling System and the low probability of DBA occurring during this period.

CL3.6-232

~~The 10 day portion of the Completion Time for Required Action C.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this Specification coupled with the low probability of an accident occurring during this time. Refer to Section 1.3 for a more detailed discussion of the purpose of the "from discovery of failure to meet the LCO" portion of the Completion Time.~~

CL3.6-147

(continued)

~~D.1~~

~~With two required containment cooling trains inoperable, one of the required containment cooling trains must be restored to OPERABLE status within 72 hours.~~ CL3.6-152 ~~The components in this degraded condition provide iodine removal capabilities and are capable of providing at least 100% of the heat removal needs after an accident. The 72 hour Completion Time was developed taking into account the redundant heat removal capabilities afforded by combinations of the Containment Spray System and Containment Cooling System, the iodine removal function of the Containment Spray System, and the low probability of DBA occurring during this period.~~

ACTIONS

~~D~~E.1 and ~~D~~E.2 (continued)

If the Required Action and associated Completion Time of Condition C ~~or D~~ of this LCO are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 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.

~~E.1~~

~~With two containment spray trains or any combination of three or more containment spray and cooling trains inoperable, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be~~ CL3.6-152

(continued)

~~entered immediately.~~

SURVEILLANCE REQUIREMENTS

SR 3.6.5~~6A~~.1

Verifying the correct alignment for manual, power operated, and automatic valves in the containment spray flow path provides assurance that the proper flow paths will exist for Containment Spray System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment (there are no~~only check~~ valves ~~are~~ inside containment) and capable of potentially being mispositioned are in the correct position.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.5~~6A~~.2

Operating each ~~[required]~~ containment cooling train fan coil unit on low motor speed for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. Motor current is measured and compared to the nominal current expected for the test condition. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed considering the known reliability of the fan coil units and controls, the two train redundancy available, and the low probability of significant degradation of the containment cooling train occurring between surveillances. It has also been shown to be acceptable through operating experience.

CL3.6-153

CL3.6-154

(continued)

SR 3.6.5~~6A~~.3

CL3.6-153

Verifying that each~~[required]~~ containment cooling train~~ESW~~ cooling water flow rate to each fan~~cooling~~ coil unit is ≥ ~~[~~9~~7~~00~~]~~ gpm provides assurance that the design flow rate assumed in the safety analyses will be achieved (Ref. 4~~3~~). Terminal temperatures of each fan coil unit are also observed. This test includes verifying operation of all essential features including low motor speed, cooling water valves and normal ventilation system dampers. The 24 month Frequency is based on: the need to perform these Surveillances under the conditions that apply during a plant outage; ~~The Frequency was developed considering~~ the known reliability of the Cooling Water System;~~,~~ the two train redundancy available;~~,~~ and the low probability of a significant degradation of flow occurring between surveillances.

CL3.6-141

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.5~~6A~~.4

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded~~during the cycle~~. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code~~(Ref. 8)~~. Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect

(continued)

incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

SR 3.6.5~~6A~~.5 and SR 3.6.5~~6A~~.6

These SRs require verification that each automatic containment spray valve actuates to its correct position and that each containment spray pump starts upon receipt of an actual or simulated actuation of a containment High-High~~3~~ pressure signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. To prevent inadvertent spray in containment, containment spray pump testing with a simulated actuation signal will be performed with the isolation valves in the spray supply lines at the containment and the spray additive tank isolation valves blocked closed. These tests will be considered satisfactory if visual observations indicate all components have operated satisfactorily. The 24 ~~[18]~~ month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed ~~at the [18] month Frequency~~. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

CL3.6-237

CL3.6-241

CL3.6-141

~~The surveillance of containment sump isolation valves is also required by SR 3.5.2.5. A single surveillance may be~~

CL3.6-238

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5~~6A~~.5 and SR 3.6.5~~6A~~.6 (continued)

~~used to satisfy both requirements.~~

(continued)

SR 3.6.5~~6A~~.7

This SR requires verification that each ~~[required]~~ containment cooling train actuates upon receipt of an actual or simulated safety injection signal. The 24~~[18]~~ month Frequency is based on engineering judgment ~~and has been shown to be acceptable through operating experience~~. See SR 3.6.5~~6A~~.5 and SR 3.6.5~~6A~~.6, above, for further discussion of the basis for the 24~~[18]~~ month Frequency. CL3.6-141

SR 3.6.5~~6A~~.8

PA3.6-158

With the ~~containment spray inlet valves closed and the~~ spray header drained ~~of any solution~~, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at ~~[the first refueling and at]~~ 10 year intervals is considered adequate to detect obstruction of the nozzles. PA3.6-157

BASES (continued)

REFERENCES

1. AEC "General Design Criteria for Nuclear Power Plant Construction Permits," Criteria 37, 38, 41, 42, 49, 52, and 58 through 61 issued for comment July 10, 1967, as referenced in USAR Section 1.2 ~~10 CFR 50, Appendix A, GDC 38, GDC 39, GDC 40, GDC 41, GDC 42, and GDC 43~~.
2. USAR Section 6.4 ~~10 CFR 50, Appendix K~~.
3. UFSAR, Section 14.5 ~~[ ]~~.
4. UFSAR, Section 6.3 ~~[ ]~~.

(continued)

5. UFSAR, Section 5.2 ~~[ ]~~.

~~6. FSAR, Section [ ].~~

~~7. FSAR, Section [ ].~~

~~8. ASME, Boiler and Pressure Vessel Code, Section XI.~~

(continued)

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.6 ~~7~~ Spray Additive System ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~

BASES

BACKGROUND

The Spray Additive System is a subsystem of the Containment Spray System that assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a Design Basis Accident (DBA).

Radioiodine in its various forms is the fission product of primary concern in the evaluation of a DBA. It is absorbed by the spray from the containment atmosphere. To enhance the iodine absorption capacity of the spray, the spray solution is adjusted to an alkaline pH that promotes iodine hydrolysis, in which iodine is converted to nonvolatile forms. Because of its stability when exposed to radiation and elevated temperature, sodium hydroxide (NaOH) is the ~~preferred~~ spray additive used at Prairie Island. The NaOH added to the spray also ensures a pH value of between 8.5 and 10.5 in the spray and greater than 7.0 in ~~11.0 of~~ the solution recirculated from the containment sump (Ref. 1). These ~~This~~ pH levels ~~band~~ minimize~~s~~ the evolution of iodine as well as the occurrence of chloride and caustic stress corrosion on mechanical systems and components. CL3.6-251 CL3.6-252

The spray additive tank contains at least 2590 gallons of solution with a sodium hydroxide concentration of 9% to 11% by weight. CL3.6-244

~~Eductor Feed Systems Only~~ CL3.6-254

~~The Spray Additive System consists of one spray additive tank that is shared by the two trains of spray additive~~

(continued)

~~equipment. Each train of equipment provides a flow path~~

BASES

BACKGROUND (continued)

~~Eductor Feed Systems Only (continued)~~

~~from the spray additive tank to a containment spray pump and consists of an eductor for each containment spray pump, valves, instrumentation, and connecting piping. Each eductor draws the NaOH spray solution from the common tank using a portion of the borated water discharged by the containment spray pump as the motive flow. The eductor mixes the NaOH solution and the borated water and discharges the mixture into the spray pump suction line. The eductors are designed to ensure that the pH of the spray mixture is between 8.5 and 11.0.~~ CL3.6-254

~~Gravity Feed Systems Only~~

The Spray Additive System consists of one spray additive tank, two parallel redundant control~~motor operated~~ valves in the line between the additive tank and the containment spray pump suction header~~refueling water storage tank (RWST)~~, instrumentation, and recirculation pumps. The NaOH solution is added to the spray water by ~~a balanced~~ gravity feed at a fixed ratio to the refueling water storage tank (RWST) flow at the suction of the containment spray pumps~~from the additive tank through the connecting piping into a weir within the RWST. There, it mixes with the borated water flowing to the spray pump suction~~. Because of the hydrostatic balance between the two tanks, the flow rate of the NaOH is controlled by the volume per foot of height ratio of the two tanks. This ensures a spray mixture pH that is ≥ 8.5 and ≤ 10.5~~11.0~~. CL3.6-254

The Containment Spray System actuation signal opens the valves from the spray additive tank to the spray pump suctions~~or the containment spray pump start signal opens~~

(continued)

~~the valves from the spray additive tank after a 5 minute delay~~. The 9~~28~~ wt.% to 1~~3~~1 wt.% NaOH solution is drawn into

BASES

BACKROUND (continued)

the spray pump suctions. ~~The spray additive tank capacity provides for the addition of NaOH solution to all of the water sprayed from the RWST into containment.~~ The percent solution and volume of solution sprayed into containment ensures a long term containment sump pH of ≥ 7.0~~9.0~~ and ≤ 10.5~~9.5~~. This ensures the continued iodine retention effectiveness of the sump water during the recirculation phase ~~of spray operation~~ and also minimizes the occurrence of chloride induced stress corrosion cracking of the stainless steel recirculation piping.

APPLICABLE SAFETY ANALYSES

The Spray Additive System is essential to the removal of airborne iodine within containment following a DBA. Following the assumed release of radioactive materials into containment, the containment is assumed to leak at its licensing basis ~~design~~ value volume for the first 24 hours following the accident. ~~The analysis assumes that 100% of containment is covered by the spray (Ref. 1).~~ CL3.6-191

The DBA response time assumed for the Spray Additive System is the same as for the Containment Spray System and is discussed in the Bases for LCO 3.6.5~~6~~, "Containment Spray and Cooling Systems."

The DBA analyses assume that one train of the Containment Spray System/Spray Additive System is inoperable and that the active ~~entire~~ spray additive tank volume is added to the remaining Containment Spray System flow path.

The Spray Additive System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

(continued)

BASES (continued)

LCO

The Spray Additive System is necessary to reduce the release of radioactive material to the environment in the event of a DBA. ~~To be considered OPERABLE, the volume and concentration of the spray additive solution must be sufficient to~~ This system provides NaOH which mixes~~injection~~ into the spray flow until the end of the injection phase~~Containment Spray System suction path is switched from the RWST to the containment sump, and~~ to raise the average spray solution pH to a level conducive to iodine removal, namely, to between 8.5 and 10.5~~[7.2 and 11.0]~~. This pH range maximizes the effectiveness of the iodine removal mechanism without introducing conditions that may induce caustic stress corrosion cracking of mechanical system components. CL3.6-256

The Spray Additive System is considered OPERABLE when: CL3.6-256

a. The volume of the spray additive solution is ≥ 2590 gal, and the concentration is ≥ 9 weight % and ≤ 11 weight %;

b. Two flow paths from the spray additive tank to the containment spray pump suction header are OPERABLE;

c. Manual valves are properly positioned and automatic valves are capable of activating to their correct positions; and

d. Piping, valves, instrumentation, and controls for the required flow paths are OPERABLE.

~~In addition, it is essential that valves in the Spray Additive System flow paths are properly positioned and that automatic valves are capable of activating to their correct positions.~~

(continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment requiring the operation of the Spray Additive System. The Spray Additive System assists in reducing the iodine fission product inventory prior to release to the environment.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Thus, the Spray Additive System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If the Spray Additive System is inoperable, it must be restored to OPERABLE within 24~~72~~ hours. The pH adjustment of the Containment Spray System flow for corrosion protection and iodine removal enhancement is reduced in this

CL3.6-161

BASES

ACTIONS

A.1 (continued)

condition. The Containment Spray System would still be available and would remove some iodine from the containment atmosphere in the event of a DBA. The 24~~72~~ hour Completion Time takes into account the redundant flow path capabilities and the low probability of the worst case DBA occurring during this period.

(continued)

B.1 and B.2

If the Spray Additive System 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 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Spray Additive System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced driving force~~pressure and temperature conditions~~ in MODE 3 for the release of radioactive material from the Reactor Coolant System. CL3.6-257

SURVEILLANCE REQUIREMENTS

SR 3.6.6~~7~~.1

Verifying the correct alignment of Spray Additive System manual, power operated, and automatic valves in the spray additive flow path provides assurance that the system is able to provide additive to the Containment Spray System in the event of a DBA. This SR does not apply to valves that

SURVEILLANCE REQUIREMENTS

SR 3.6.6~~7~~.1 (continued)

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. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position.

(continued)

SR 3.6.~~67~~.2

To provide effective iodine removal, the containment spray must be an alkaline solution. Since the RWST contents are normally acidic, the volume of the spray additive tank must provide a sufficient volume of spray additive to adjust pH for all water injected. This SR is performed to verify the availability of sufficient NaOH solution in the Spray Additive System. The 184 day Frequency was developed based on the low probability of an undetected change in tank volume occurring during the SR interval (the tank is isolated during normal unit operations). Tank level is ~~also~~ indicated and alarmed in the control room, so that there is high confidence that a substantial change in level would be detected.

SR 3.6.~~67~~.3

This SR provides verification of the NaOH concentration in the spray additive tank and is sufficient to ensure that the spray solution being injected into containment is at the correct pH level. The 184 day Frequency is sufficient to ensure that the concentration level of NaOH in the spray additive tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.~~67~~.3 (continued)

concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

(continued)

SR 3.6.6~~7~~.4

This SR provides verification that each automatic valve in the Spray Additive System flow path actuates to its correct position. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 24~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage ~~and the potential for an unplanned transient if the Surveillance were performed with the reactor at power~~. Operating experience has shown that these components usually pass the Surveillance when performed ~~at the [18] month Frequency~~. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. CL3.6-141

~~SR 3.6.7.5~~ CL3.6-163

~~To ensure that the correct pH level is established in the borated water solution provided by the Containment Spray System, the flow rate in the Spray Additive System is verified once every 5 years. This SR provides assurance that the correct amount of NaOH will be metered into the flow path upon Containment Spray System initiation. Due to the passive nature of the spray additive flow controls, the 5 year Frequency is sufficient to identify component degradation that may affect flow rate.~~

BASES (continued)

REFERENCES 1. UFSAR, Section 6.4 ~~Chapter [15]~~.

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.7 ~~8~~ Hydrogen Recombiners ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual) (if permanently installed)~~

CL3.6-164

BASES

BACKGROUND

The function of the hydrogen recombiners is to eliminate the potential breach of containment due to a hydrogen oxygen reaction.

Per 10 CFR 50.44, "Standards for Combustible Gas Control Systems in Light-Water-Cooled Reactors" ~~(Ref. 1), and GDC 41, "Containment Atmosphere Cleanup" (Ref. 2)~~, hydrogen recombiners are required to reduce the hydrogen concentration in the containment following a loss of coolant accident (LOCA) ~~or steam line break (SLB)~~. The recombiners accomplish this by recombining hydrogen and oxygen to form water vapor. The vapor remains in containment, thus eliminating any discharge to the environment. The hydrogen recombiners are manually initiated since flammable limits would not be reached until several days after a Design Basis Accident (DBA). CL3.6-261

Two 100% capacity independent hydrogen recombiner systems are provided. Each consists of controls located in the auxiliary building ~~control room~~, a power supply and a recombiner. Recombination is accomplished by heating a hydrogen air mixture above 1150°F. The resulting water vapor and discharge gases are cooled prior to discharge from the recombiner. A single recombiner is capable of maintaining the hydrogen concentration in containment below the 4.0 ~~1~~ volume percent (v/o) flammability limit. Two recombiners are provided to meet the requirement for redundancy and independence. Each recombiner is powered from a separate Engineered Safety Features bus, and is provided with a separate power panel and control panel. CL3.6-262 CL3.6-263

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The hydrogen recombiners provide for the capability of controlling the bulk hydrogen concentration in containment to less than the lower flammable concentration of 4.0~~1~~ v/o following a DBA. This control would prevent a containment wide hydrogen burn, thus ensuring the pressure and temperature assumed in the analyses are not exceeded. The limiting DBA relative to hydrogen generation is a LOCA. CL3.6-263

Hydrogen may accumulate in containment following a LOCA as a result of:

a. A metal steam reaction between the zirconium fuel rod cladding and the reactor coolant;

b. Radiolytic decomposition of water in the Reactor Coolant System (RCS) and the containment sump;

c. Hydrogen in the RCS at the time of the LOCA (i.e., hydrogen dissolved in the reactor coolant and hydrogen gas in the pressurizer vapor space); or

d. Corrosion of metals exposed to containment spray and Emergency Core Cooling System solutions.

To evaluate the potential for hydrogen accumulation in containment following a LOCA, the hydrogen generation as a function of time following the initiation of the accident is calculated. Conservative assumptions recommended by Reference 1~~3~~ are used to maximize the amount of hydrogen calculated.

Based on the conservative assumptions used to calculate the hydrogen concentration versus time after a LOCA, the hydrogen concentration in the primary containment would reach 3.5 v/o about 10~~6~~ days after the LOCA and 4.0 v/o about 6~~2~~ days later if no recombiner was functioning (Ref. 2~~3~~). Initiating the CL3.6-191

(continued)

hydrogen recombiners when the primary containment hydrogen concentration reaches 3.5 v/o

BASES

APPLICABLE SAFETY ANALYSES (continued)

will maintain the hydrogen concentration in the primary containment below flammability limits.

The hydrogen recombiners are designed such that, with the conservatively calculated hydrogen generation rates discussed above, a single recombiner is capable of limiting the peak hydrogen concentration in containment to less than 4.0 v/o (Ref. 24). ~~The Hydrogen Purge System is similarly designed such that one of two redundant trains is an adequate backup to the redundant hydrogen recombiners.~~ CL3.6-166

The hydrogen recombiners satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

Two hydrogen recombiners must be OPERABLE. This ensures operation of at least one hydrogen recombiner in the event of a worst case single active failure.

PA3.6-266

A hydrogen recombiner is considered OPERABLE when its heater, power supply and controls, are OPERABLE. Operation with at least one hydrogen recombiner ensures that the post LOCA hydrogen concentration can be prevented from exceeding the flammability limit.

APPLICABILITY

In MODES 1 and 2, two hydrogen recombiners are required to control the hydrogen concentration within containment below its flammability limit of 4.01 v/o following a LOCA, assuming a worst case single active failure. CL3.6-263

(continued)

In MODES 3 and 4, both the hydrogen production rate and the total hydrogen produced after a LOCA would be less than that calculated for the DBA LOCA. Also, because of the limited time in these MODES, the probability of an accident requiring the hydrogen recombiners is low. Therefore, the hydrogen recombiners are not required in MODE 3 or 4.

BASES

APPLICABILITY (continued)

In MODES 5 and 6, the probability and consequences of a LOCA are low, due to the pressure and temperature limitations in these MODES. Therefore, hydrogen recombiners are not required in these MODES.

ACTIONS

A.1

With one containment hydrogen recombiner inoperable, the inoperable recombiner must be restored to OPERABLE status within 30 days. In this condition, the remaining OPERABLE hydrogen recombiner is adequate to perform the hydrogen control function. However, the overall reliability is reduced because a single failure in the OPERABLE recombiner could result in reduced hydrogen control capability. The 30 day Completion Time is based on the availability of the other hydrogen recombiner, the small probability of a LOCA ~~or SLB~~ occurring (that would generate an amount of hydrogen that exceeds the flammability limit), and the amount of time available after a LOCA ~~or SLB~~ (should one occur) for operator action to prevent hydrogen accumulation from exceeding the flammability limit. CL3.6-261

Required Action A.1 has been modified by a Note that states the provisions of LCO 3.0.4 are not applicable. As a result, a MODE change is allowed when one recombiner is inoperable. This allowance is based on the availability of the other hydrogen recombiner, the small probability of a LOCA ~~or SLB~~ occurring (that would CL3.6-261

(continued)

BASES

generate an amount of hydrogen that exceeds the flammability limit), and the amount of time available after a LOCA ~~or SLB~~ (should one occur) for operator action to prevent hydrogen accumulation from exceeding the flammability limit.

ACTIONS (continued)

~~B.1 and B.2~~

CL3.6-166

~~Reviewer's Note: This Condition is only allowed for units with an alternate hydrogen control system acceptable to the technical staff.~~

~~With two hydrogen recombiners inoperable, the ability to perform the hydrogen control function via alternate capabilities must be verified by administrative means within 1 hour. The alternate hydrogen control capabilities are provided by [the containment Hydrogen Purge System/hydrogen recombiner/Hydrogen Ignitor System/Hydrogen Mixing System/Containment Air Dilution System/Containment Inerting System]. The 1 hour Completion Time allows a reasonable period of time to verify that a loss of hydrogen control function does not exist. [Reviewer's Note: The following is to be used if a non-Technical Specification alternate hydrogen control function is used to justify this Condition: In addition, the alternate hydrogen control system capability must be verified once per 12 hours thereafter to ensure its continued availability.] [Both] the [initial] verification [and all subsequent verifications] may be performed as an administrative check by examining logs or other information to determine the availability of the alternate hydrogen control system. It does not mean to perform the Surveillances needed to demonstrate OPERABILITY of the alternate hydrogen control system. If the ability to perform the hydrogen control function is maintained, continued operation is permitted with two hydrogen recombiners inoperable for up to 7 days. Seven days is a~~

(continued)

BASES

~~reasonable time to allow two hydrogen recombiners to be inoperable because the hydrogen control function is maintained and because of the low probability of the occurrence of a LOCA that would generate hydrogen in the amounts capable of exceeding the flammability limit.~~ CL3.6-166

ACTIONS (continued)

B~~C~~.1

If the inoperable hydrogen recombiner~~(s)~~ 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 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.~~7~~8.1

Performance of a system functional test for each hydrogen recombiner ensures the recombiners are operational and can attain and sustain the temperature necessary for hydrogen recombination. In particular, this SR verifies that the minimum heater sheath temperature increases to ≥ 700°F in ≤ 90 minutes. After reaching 700°F, the power is increased to maximum power for approximately 2 minutes and power is verified to be ≥ 60 kW.

Operating experience has shown that these components usually pass the Surveillance when performed~~ at the [18] month Frequency~~. Therefore, the 24 month Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.78.2

This SR ensures there are no physical problems that could affect recombiner operation (such as loose wiring or structural connections, or deposits of foreign materials). Since the recombiners are mechanically passive, they are not subject to mechanical failure. The only credible failure CL3.6-267

SURVEILLANCE REQUIREMENTS (continued

SR 3.6.78.2

involves loss of power, blockage of the internal flow, missile impact, etc.

A visual inspection is sufficient to determine abnormal conditions that could cause such failures. The 24~~[18]~~ month Frequency for this SR was developed considering the incidence of hydrogen recombiners failing the SR in the past is low. CL3.6-141

SR 3.6.78.3

This SR requires performance of a resistance to ground test for each heater phase to ensure that there are no detectable grounds in any heater phase. This is accomplished by verifying that the resistance to ground for any heater phase is ≥ 10,000 ohms.

The 24~~[18]~~ month Frequency for this Surveillance was developed considering the incidence of hydrogen recombiners failing the SR in the past is low. CL3.6-141

(continued)

BASES

REFERENCES

1. Regulatory Guide 1.7, dated 3/10/71~~10 CFR 50.44~~.

2. USAR Section 5.4~~10 CFR 50, Appendix A, GDC 41~~.

~~3. Regulatory Guide 1.7, Revision [1].~~

~~4. FSAR Section 15.~~

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.8~~12~~ Vacuum Breaker System~~Relief Valves (Atmospheric and Ice Condenser)~~

CL3.6-167 CL3.6-171

BASES

BACKGROUND

The purpose of the vacuum breaker system~~relief lines~~ is to protect the containment vessel against negative pressure (i.e., a lower pressure inside than outside). Excessive negative pressure inside containment can occur if there is an inadvertent actuation of containment cooling features, such as the Containment Spray System or Containment Cooling System. Multiple equipment failures or human errors are necessary to cause inadvertent actuation of these systems. PA3.6-270

The containment pressure vessel contains two 100% vacuum breaker trains~~relief lines~~ that protect the containment from excessive external loading.

~~For this facility,~~ ~~[~~The characteristics of the vacuum breakers~~relief valves~~ and their locations in the containment pressure vessel are as follows:

Two vacuum breakers are used in each of two large vent lines which permit air to flow from the Shield Building annulus into the Reactor Containment Vessel. The vacuum breakers consist of an air to close, spring loaded to open butterfly valve and a self-actuated horizontally installed, swinging disc check valve. An air accumulator is provided for each of the air-operated vacuum breakers to allow vacuum breaker operation in the event of a loss of instrument air. The vent lines enter the containment vessel through independent and widely separated containment penetration nozzles. CL3.6-271

(continued)

APPLICABLE SAFETY ANALYSES

Design of the vacuum breaker system~~relief lines~~ involves calculating the effect of inadvertent actuation of containment cooling features, which can reduce the atmospheric temperature (and hence pressure) inside containment (Ref. 1). Conservative assumptions are used for all the relevant parameters in the calculation; for example, for the Containment Spray System, the minimum spray water temperature, maximum initial containment temperature, maximum spray flow, all spray trains operating, all four containment fan units operating with maximum cooling water flow rate with minimum inlet water temperature, etc. The resulting containment pressure versus time is calculated, including the effect of the opening of the vacuum relief CL3.6-191

BASES

APPLICABLE SAFETY ANALYSES (continued)

lines when their negative pressure setpoint is reached. It is also assumed that one valve fails to open.

The containment shell was designed for an external pressure load equivalent to 0.8~~[-2.5]~~ psig greater than the internal pressure. The inadvertent actuation of the containment cooling features was analyzed to determine the resulting reduction in containment pressure. The analysis shows that one vacuum breaker train will terminate this transient before 0.8 psi pressure differential is reached. ~~The initial pressure condition used in this analysis was [-0.3] psig. This resulted in a minimum pressure inside containment of [-2.0] psig, which is less than the design load.~~ CL3.6-191

The vacuum breaker system~~relief valves~~ must also perform the containment isolation function in a containment high pressure event. For this reason, the system is designed to take the full containment positive design pressure and the environmental conditions (temperature, pressure, humidity, radiation, chemical attack, etc.) associated with the containment DBA.

(continued)

The vacuum relief valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

The LCO establishes the minimum equipment required to accomplish the vacuum relief function following the inadvertent actuation of containment cooling features. Two 100% vacuum breaker trains~~relief lines~~ are required to be OPERABLE to ensure that at least one is available, assuming one or both valves in the other line fail to open.

A vacuum breaker train is OPERABLE when both valves, including air supplies, instrumentation, controls and actuating and power circuits, are OPERABLE. PA3.6-272

APPLICABILITY

In MODES 1, 2, 3, and 4, the containment cooling features, such as the Containment Spray System, are required to be OPERABLE to mitigate the effects of a DBA. Excessive negative pressure inside containment could occur whenever these systems are required to be OPERABLE due to inadvertent actuation of these systems. Therefore, the vacuum breaker trains~~relief lines~~ are required to be OPERABLE in MODES 1, 2, 3, and 4 to mitigate the effects of inadvertent actuation of the Containment Spray System~~, Quench Spray (QS) System~~, or Containment Cooling System. CL3.6-273

APPLICABILITY (continued)

In MODES 5 and 6, the probability and consequences of a DBA are reduced due to the pressure and temperature limitations of these MODES. The Containment Spray System~~, QS System~~, and Containment Cooling System are not required to be OPERABLE in MODES 5 and 6. Therefore, maintaining OPERABLE vacuum relief valves is not required in MODE 5 or 6. CL3.6-273

(continued)

ACTIONS

A.1

When the containment isolation function of one vacuum breaker train is inoperable, the vacuum breaker train flow path must be isolated in accordance with the requirements of Specification 3.6.3, "Containment Isolation Valves." This Action Statement requires immediate entry into LCO 3.6.3 Condition A to assure that the containment isolation function is maintained in a consistent, timely manner. CL3.6-172

When the butterfly valve is inoperable, the pushbutton test circuit should be disabled to "de-activate" the check valve. When the check valve is inoperable, the butterfly valve should be mechanically blocked to ensure that the valve remains closed.

B~~A~~.1

When the vacuum relief function of one ~~of the required~~ vacuum breaker train~~relief lines~~ is inoperable, the inoperable train~~line~~ must be restored to OPERABLE status within 7 days ~~72 hours~~. The allowed Completion Time is reasonable considering the redundancy of the other vacuum breaker train, its reliable vacuum relief capability due to the passive design and the low probability of an event requiring use of the vacuum breaker system during this time. ~~The specified time period is consistent with other LCOs for the loss of one train of a system required to mitigate the consequences of a LOCA or other DBA.~~ CL3.6-172

BASES

(continued)

ACTIONS (continued)

CB.1 and CB.2

If the vacuum breaker train containment isolation function or vacuum relief function~~relief line~~ 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 6 hours and to MODE 5 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. CL3.6-172

SURVEILLANCE REQUIREMENTS

SR 3.6.8~~12~~.1

This SR requires verification that each automatic function of each vacuum breaker train actuates as required to perform its safety function. ~~cites the Inservice Testing Program, which establishes the requirement that inservice testing of the ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with Section XI of the ASME, Boiler and Pressure Vessel Code and applicable Addenda (Ref. 2). Therefore, SR Frequency is governed by the Inservice Testing Program.~~ Testing shall include demonstration that an actual or simulated containment vacuum equal to or more negative than -0.5 psi will open the air-operated valve and an actual or simulated safety injection signal will close the valve. The 92 day Frequency is based on engineering judgement and has been shown to be acceptable through operating experience. CL3.6-173

SR 3.6.8.2

This SR requires the performance of a CHANNEL CALIBRATION. A CHANNEL CALIBRATION is performed every 24 months, or approximately at every refueling. Operating experience has shown that these components usually pass the Surveillance when performed. CL3.6-181

(continued)

REFERENCES

1. UFSAR, Section 5.2~~[6.2]~~.

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

(continued)

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.9~~13~~ Shield Building Ventilation~~Air Cleanup~~ System (SBV~~AC~~S) ~~(Dual and Ice Condenser)~~

PA3.6-174

BASES

BACKGROUND

As described in the USAR the SBV~~AC~~S is required by AEC~~10 CFR 50, Appendix A,~~ GDC 70~~41~~, "Control of Releases of Radioactivity to the Environment" ~~"Containment Atmosphere Cleanup"~~ (Ref. 1), to ensure that radioactive materials that leak from the primary containment into the shield building (secondary containment) following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment. CL3.6-231

The containment has a secondary containment called the shield building, which is a concrete structure that surrounds the steel primary containment vessel. Between the containment vessel and the shield building inner wall is an annular space that collects a portion of the ~~any~~ containment leakage ~~that may occur~~ following a loss of coolant accident (LOCA). This space also allows for periodic inspection of the outer surface of the steel containment vessel. CL3.6-274

The SBV~~AC~~S establishes a negative pressure in the annulus between the shield building and the steel containment vessel following a DBA. Filters in the system then control the release of radioactive contaminants to the environment. Shield building OPERABILITY is required to ensure retention of primary containment leakage and proper operation of the SBV~~AC~~S. CL3.6-274

The SBV~~AC~~S consists of two separate and redundant trains. Each train includes a heater, ~~[cooling coils,]~~ a prefilter, moisture separators, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for

(continued)

removal of radioiodines, a recirculation fan and an exhaust fan. Ductwork, valves and/or dampers, and instrumentation also form part of the system. The ventilation system for each Shield Building includes a vent stack which penetrates the Shield Building dome and discharges to the atmosphere. The moisture separators function to reduce the moisture content of the airstream. ~~A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank. Only~~ T~~[the upstream~~ HEPA filter and the charcoal adsorber section are credited in the analysis. The system

CL3.6-274

BASES

BACKGROUND (continued)

initiates and maintains a negative air pressure in the shield building by means of filtered exhaust ventilation of the shield building following receipt of a safety injection (SI) signal. The system is described in Reference 2.

The prefilters remove large particles in the air, and the moisture separators remove entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal absorbers. Heaters are~~may be~~ included to reduce the relative humidity of the airstream~~ on systems that operate in high humidity~~. Continuous operation of each train, for at least 10 hours per month, with heaters on, reduces moisture buildup on their HEPA filters and adsorbers.~~ [The cooling coils cool the air to keep the charcoal beds from becoming too hot due to absorption of fission product.]~~

CL3.6-274

~~During normal operation, the Shield Building Cooling System is aligned to bypass the SBACS's HEPA filters and charcoal adsorbers. For SBACS operation following a DBA, however, the bypass dampers automatically reposition to draw the air through the filters and adsorbers.~~

CL3.6-274

(continued)

The SBV~~AC~~S reduces the radioactive content in the shield building atmosphere following a DBA. Loss of the SBV~~AC~~S could cause site boundary doses, in the event of a DBA, to exceed the values given in the licensing basis.

APPLICABLE SAFETY ANALYSES

The SBV~~AC~~S design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 3) assumes that only one train of the SBV~~AC~~S is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the remaining one train of this filtration system. The amount of fission products available for release from containment is determined for a LOCA.

CL3.6-191

The modeled SBV~~AC~~S actuation in the safety analyses is based upon a worst case response time following an SI initiated at the limiting setpoint. The total response time, from accident initiation~~exceeding the signal setpoint~~ to attaining a~~the~~ negative pressure ~~of [0.5] inch water gauge~~ in the shield building, is less than 4.5

BASES

APPLICABLE SAFETY ANALYSES (continued)

minutes~~[22 seconds]~~. This response time bounds the~~is composed of~~ signal delay, diesel generator startup and sequencing time, system startup time, and time for the system to attain the required pressure after starting.

The SBV~~AC~~S satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

In the event of a DBA, one SBV~~AC~~S train is required to provide the minimum particulate iodine removal assumed in the safety analysis. Two trains of the SBV~~AC~~S must be

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(continued)

BASES (continued)

OPERABLE to ensure that at least one train will operate, assuming that the other train is disabled by a single active failure.

A train of SBVS is OPERABLE when its associated: PA3.6-276

a. Recirculation and exhaust fan are OPERABLE;

b. HEPA filter and charcoal adsorber are capable of passing their design flow and performing their filtration function;

c. Manual valves and dampers are properly positioned and automatic valves and dampers are capable of activating to their correct positions; and

d. Heater, ductwork, valves, dampers, instrumentation and controls for the required flow path are OPERABLE.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could lead to fission product release to containment that leaks to the shield building. The large break LOCA, on which this system's design is based, is a full power event. Less severe LOCAs and leakage still require the system to be OPERABLE throughout these MODES. The probability and severity of a LOCA decrease as core power and Reactor Coolant System pressure decrease. With the reactor shut down, the probability of release of radioactivity resulting from such an accident is low.

In MODES 5 and 6, the probability and consequences of a DBA are low due to the pressure and temperature limitations in these MODES. Under these conditions, the SBV~~Filtration~~ System is not required to be OPERABLE~~(although one or more trains may be operating for other reasons, such as habitability during maintenance in the shield building annulus)~~. CL3.6-274

(continued)

ACTIONS

A.1

With one SBV~~AC~~S train inoperable, the inoperable train must be restored to OPERABLE status within 7 days. In this degraded condition, the remaining components~~The components in this degraded condition~~ are capable of providing 100% of the iodine removal needs after a DBA. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant

PA3.6-277

BASES

ACTIONS

A.1 (continued)

SBV~~AC~~S train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs.

B.1 and B.2

If the SBV~~AC~~S train 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 6 hours and to MODE 5 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)

SURVEILLANCE REQUIREMENTS

SR 3.6.~~913~~.1

~~Operating each SBACS train for ≥ 15 minutes ensures that all trains 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. For systems with heaters, O~~operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours eliminates moisture on the adsorbers and HEPA filters. Experience from filter testing ~~at operating units~~ indicates that the 10 hour period is adequate for moisture elimination on the adsorbers and HEPA filters. Periodic operation also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls, the two train redundancy available, and the iodine removal capability of the Containment Spray System. CL3.6-281 CL3.6-281

SR 3.6.~~913~~.2

This SR verifies that the required SBV~~ACS~~ filter testing is performed in accordance with the Ventilation Filter Testing

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.~~913~~.2 (continued) CL3.6-282

Program (VFTP). ~~The SBACS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4).~~ The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical

(continued)

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 3.6.9.3

CL3.6-141

The automatic startup ensures that each SBV~~AC~~S train responds properly. The 24~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage~~ and the potential for an unplanned transient if the Surveillance were performed with the reactor at power~~. Operating experience has shown that these components usually pass the Surveillance when performed~~ at the [18] month Frequency~~. Therefore the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the SR interval was developed considering that the SBV~~AC~~S equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.9~~13~~.1.

PA3.6-283

SR 3.6.9~~13~~.4

CL3.6-176

The SBV~~AC~~S isolation~~filter bypass~~ dampers are tested to verify OPERABILITY. The dampers are in the closed~~bypass~~ position during normal plant operation and must reposition for accident operation to draw air through the filters. The 24~~[18]~~ month Frequency is considered to be acceptable based on damper reliability and design, mild environmental conditions in the vicinity of the dampers, and the fact that operating experience has shown that the dampers usually pass the Surveillance when performed~~ at the [18] month Frequency~~.

CL3.6-141

SR 3.6.9~~13~~.5

The proper functioning of the fans, dampers, filters, adsorbers, etc., as a system is verified by the ability of

(continued)

BASES

CL3.6-177

SURVEILLANCE REQUIREMENTS

SR 3.6.9 ~~13~~.5 (continued)

each train to produce the required system negative pressure ~~flow rate~~. A negative pressure equal to or more negative than -2.00 inches water gage is required to be developed in the annulus and a negative pressure equal to or more negative than -1.82 inches water gage is required to be maintained after the recirculation dampers open and equilibrium is established. Equilibrium negative pressure equal to or more negative than -1.82 inches water gage is that predicted for non-accident conditions and leakage equal to 75% of the maximum allowable shield building inleakage (Reference 4).

The 31 day ~~[18] month~~ Frequency provides assurance that the system will function as required ~~on a STAGGERED TEST BASIS is consistent with Regulatory Guide 1.52 (Ref. 4) guidance for functional testing~~.

REFERENCES

1. AEC "General Design Criteria for Nuclear Power Plant Construction Permits," Criterion 70, issued for comment July 10, 1967, as referenced in USAR Section 1.2 ~~10 CFR 50, Appendix A, GDC 41~~.

2. UFSAR, Section 5.3 ~~[6.5]~~.

3. UFSAR, Section 14.9 ~~Chapter [15]~~.

4. Report to the United States Nuclear Regulatory Commission Division of Operating Reactors - Prairie Island Containment Systems Special Analyses", dated April 9, 1976 ~~Regulatory Guide 1.52, Revision [1]~~.

B 3.6 CONTAINMENT SYSTEMS

PA3.6-186

B 3.6.10~~9~~ Shield Building~~(Dual and Ice Condenser)~~

BASES

BACKGROUND

The shield building is a concrete structure that surrounds the steel containment vessel. Between the containment vessel and the shield building inner wall is an annular space that collects a portion of the containment leakage that may occur following a design basis accident (DBA)~~loss of coolant accident (LOCA)~~. This space also allows for periodic inspection of the outer surface of the steel containment vessel. The shield building provides biological shielding for DBA conditions, protects the containment vessel from low temperatures, adverse atmospheric conditions and external missiles, and provides the means for collecting and filtering containment fission product leakage following a DBA (Ref. 1). CL3.6-274

Following a DBA t~~T~~he Shield Building Ventilation ~~Air Cleanup~~ System (SBV~~AC~~S) establishes a negative pressure in the annulus between the shield building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment. The shield building is required to be OPERABLE to ensure retention of containment leakage and proper operation of the SBV~~AC~~S. CL3.6-274

APPLICABLE SAFETY ANALYSES

The design basis for shield building OPERABILITY is a loss of coolant accident (LOCA).

Maintaining shield building OPERABILITY ensures that the release of radioactive material from the containment atmosphere is restricted to those leakage paths and associated leakage rates assumed in the accident analyses.

(continued)

The shield building satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

BASES

LCO

Shield building OPERABILITY must be maintained to ensure proper operation of the SBV~~AC~~S and to limit radioactive leakage from the containment to those paths and leakage rates assumed in the accident analyses. The Shield Building is OPERABLE when:

CL3.6-284

a. At least one door in each access opening is closed including when the access opening is being used for normal transit entry and exit;

b. The Shield Building equipment opening is closed; and

c. At least one SBVS train is operable in accordance with SR 3.6.9.5.

APPLICABILITY

Maintaining shield building OPERABILITY prevents leakage of radioactive material from the shield building. Radioactive material may enter the shield building from the containment following a DBA~~LOCA~~. Therefore, shield building OPERABILITY is required in MODES 1, 2, 3, and 4 when a DBA~~steam line break, LOCA, or rod ejection accident~~ could release radioactive material to the containment atmosphere.

CL3.6-191

In MODES 5 and 6, the probability and consequences of a DBA~~these events~~ are low due to the Reactor Coolant System temperature and pressure limitations in these MODES. Therefore, shield building OPERABILITY is not required in MODE 5 or 6.

(continued)

BASES

ACTIONS

A.1

In the event shield building OPERABILITY is not maintained, shield building OPERABILITY must be restored within 24 hours. Twenty-four hours is a reasonable Completion Time considering the limited leakage design of containment and the low probability of a Design Basis Accident occurring during this time period.

B.1 and B.2

If the shield building 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 6 hours and to MODE 5 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

CL3.6-182

~~SR 3.6.19.1~~

~~Verifying that shield building annulus negative pressure is within limit ensures that operation remains within the limit assumed in the containment analysis. The 12 hour Frequency of this SR was developed considering operating experience related to shield building annulus pressure variations and pressure instrument drift during the applicable MODES.~~

(continued)

SR 3.6.10~~19~~.2

Maintaining shield building OPERABILITY requires verifying~~maintaining~~ one~~each~~ door in the access opening closed~~, except when the access opening is being used for normal transient entry and exit (then at least one door must remain closed)~~. Each access opening into the shield building contains one inner and one outer door. The intent is to not breach the shield building boundary at any time when the shield building boundary is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times. However, all shield building 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 of this SR is based on engineering judgment and is considered adequate in view of the other indications of door status that are available to the operator. TA3.6-183

~~SR 3.6.19.3~~ CL3.6-184

~~This SR would give advance indication of gross deterioration of the concrete structural integrity of the shield building. The Frequency of this SR is the same as that of SR 3.6.1.1. The verification is done during shutdown.~~

~~SR 3.6.19.4~~ CL3.6-177

~~The ability of a SBACS train with final flow ≤ [ ] cfm to produce the required negative pressure ≥ 0.5 inch water gauge during the test operation within [22] seconds provides assurance that the building is adequately sealed. The negative pressure prevents leakage from the building, since outside air will be drawn in by the low pressure. The~~

BASES

(continued)

~~SURVEILLANCE REQUIREMENTS~~

~~SR 3.6.19.4 (continued)~~

~~negative pressure must be established within the time limit to ensure that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure.~~

CL3.6-177

~~The SBACS trains are tested every 18 months on a STAGGERED TEST BASIS to ensure that in addition to the requirements of LCO 3.6.13, "Shield Building Air Cleanup System," either SBACS train will perform this test. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage.~~

REFERENCES

1. USAR, Section 5.3~~None~~.

PACKAGE 3.6

CONTAINMENT SYSTEMS

PART F

JUSTIFICATION FOR DIFFERENCES
(JFD)

from

NUREG-1431
IMPROVED STANDARD TECHNICAL SPECIFICATIONS

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 AND 2

Improved Technical Specifications
Conversion Submittal

PART F

PACKAGE 3.6

CONTAINMENT SYSTEMS

JUSTIFICATION FOR DIFFERENCES FROM IMPROVED STANDARD TECHNICAL SPECIFICATIONS (NUREG-1431) AND BASES

See Part E for specific proposed wording and location of referenced deviations.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	101	The PI containment system uses a free standing steel containment vessel surrounded by a concrete shield building which provides an annulus between the two structures. The PI design is most closely represented by the NUREG-1431 "Dual" containment category. With the exception of the specification for vacuum relief valves, those optional containment specifications for other categories are not included in the PI ITS. Accordingly, the parenthetical containment design classifications have not been included from all titles in this Section of the PI ITS. The PI containment does not use post tensioned tendons; thus all requirements associated with post tensioned tendons are not included.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	102	These changes incorporate CTS requirements which include a Containment Leakage Rate Testing Program in accordance with 10 CFR 50 Appendix J Option B. This change also incorporates the provisions of TSTF-52, Revision 3 as appropriate.
CL	103	CTS 3.6.J requires containment average air temperature to be less than or equal to 44°F above the average air temperature in the shield building when containment integrity is required. This current specification is implemented through CTS SR 4.4.G which requires verification of containment air temperature difference from the shield building prior to requiring containment integrity, that is, prior to entering MODE 4 from MODE 5. The containment vessel is uninsulated steel and the concrete shield building walls and dome are 2.5 and 2.0 feet thick respectively. Thus, once the average air temperature difference limit has been established it will continue to be met during plant operation, since heat generated in containment will readily heat the relatively insulated shield building. The current TS requirements are included in proposed SR 3.6.1.2 and the associated Bases. Since the CTS requirements for containment air temperature are addressed as PI ITS SR 3.6.1.2, the NUREG-1431 Specification for Containment Air Temperature, 3.6.5 is unnecessary and has not been included in the PI ITS.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	104	CTS 3.6.K requires the containment vessel shell temperature to be greater than or equal to 30 °F whenever containment integrity is required. This specification is implemented through CTS SR 4.4.H which requires verification of containment shell temperature prior to requiring containment integrity, that is prior to entering MODE 4 from MODE 5. These CTS requirements are embodied in proposed PI ITS SR 3.6.1.3 and the associated Bases. Once plant operation commences, the plant heat in containment and the insulating effect of the shield building assure that the containment shell remains above 30°F.
	105	Not used.
PA	106	Minor wording change to make the meaning of this Note clear to the plant operators.
TA	107	This change incorporates TSTF-17, Revision 2. The Bases justification for the 24 month Frequency was revised to read better.
X	108	This is a new SR requirement for PI. Current plant practice is to perform this test during refueling outages. Thus, the Frequency for this SR is proposed as 24 months to allow this test to be performed during refueling outages.

Difference Category	Difference Number 3.6-	Justification for Differences
	109	Not used.
	110	Not used.
	111	Not used.
CL	112	CTS 3.6.D.1 requirements for blind flanging the 36-inch containment purge system have been relocated to the Bases for 3.6.3. A new SR, 3.6.3.1, is included to assure that the blind flange is installed prior to plant startup.
PA	113	Penetrations with automatic isolation valves may be unisolated to support plant operations. This note applies to those penetration flow paths which do not have automatic isolation; thus "non-automatic" has been included to clarify which flow paths may be open under administrative controls.
PA	114	The PI title for the 36-inch purge system is "containment purge".
	115	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	116	Conditions A, B and C Notes are revised to more clearly describe the penetration flow paths to which these Conditions apply. Introduction of a closed system as the differentiating feature makes the Specification easier for the operators to understand. This change is consistent with approved GITS.
PA	117	One containment penetration flow path, the vacuum breaker system requires that the butterfly valve be mechanically blocked in addition to de-activating the valve. Thus, the phrase, "or mechanically blocked" has been added to the Required Actions. The 3.6.3 Bases include a reference to the 3.6.8 Bases for additional guidance on the actions required to assure containment isolation is maintained when a valve in the vacuum breaker flow path is inoperable.
	118	Not used.
TA	119	This change incorporates TSTF-269, Revision 2.
	120	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	121	Shield building bypass leakage is determined in accordance with the PI Containment Leakage Rate Testing Program at the frequency specified in the Program. At the time this test is performed, containment integrity would not be required and leakage in excess of the limits would be corrected prior to requiring containment integrity. CTS does not require any more frequent determinations of bypass leakage or treatment of bypass leakage different from other penetration barrier inoperability. Thus NUREG-1431 Condition D for shield building bypass leakage not within limit is not included in the PI ITS and the exception for shield building bypass leakage in Conditions A and B are not included. The end result is that shield building bypass leakage is included with the other penetration barrier inoperability.
TA	122	Incorporates TSTF-30, Revision 3. The Bases do not include reference to Standard Review Plan (SRP) 6.2.4 since PI is not committed to this SRP.

Difference Category	Difference Number 3.6-	Justification for Differences
X	123	This SR is a new requirement for PI; thus the more restrictive 31 day Frequency has been changed to 92 days. The PI CTS do not contain this requirement and quarterly verification is more consistent with current plant practice. Furthermore, all containment isolation devices have a containment isolation tag identifying the device as a containment isolation device. This tag provides additional administrative control that ensures the Frequency of 92 days is adequate.
PA	124	The only time the plant would be aware of shield building leakage in excess of the limits would be following performance of 10CFR50 Appendix J testing in accordance with the PI Containment Leakage Rate Testing Program and at the Frequency required by the Program. At the time of performing leakage rate testing, containment integrity would not be required and leakage in excess of the allowable limits would be corrected prior to requiring containment integrity. CTS does not require more frequent determinations of bypass leakage or treatment of bypass leakage different from other penetration barrier inoperability. Thus NUREG-1431 Condition D for shield building bypass leakage not within limit is not included in the PI ITS and the exception for shield building bypass leakage in Conditions A and B are not included. The end result is that shield building bypass leakage is included with the other penetration barrier inoperability.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	125	Clarification is provided on the type of valve which applies. The references to "manual" and "automatic" are not consistent within the TS and do not adequately include all of the applicable valves. In some instances, "power operated" is more approriate than "automatic". In other places, "non-automatic" replaces "manual" to be more accurate.
CL	126	NUREG-1431 Condition E for containment valves exceeding their leakage limits has not been included. CTS 3.6.D.1 and ITS SR 3.6.3.1 require the containment (36-inch) purge system to be blind flanged during plant operation and therefore valves leakage specifications are meaningless. In accordance with CTS 3.6.D.1, 3.6.D.2, ITS 3.6.3 Bases and SR 3.6.3.2, the inservice (18-inch) containment purge system is either blind flanged or its isolation valves are tested prior to use of the system. Upon completion of use of the system, the blind flanges are required to be installed and tested to meet the Containment Leakage Rate Testing Program. Thus ISTS Specification 3.6.3 Condition E is not applicable to the PI containment purge systems and is not included.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	127	This SR is modified to be consistent with CTS and proposed ITS 3.6.3 Bases which require the containment (36-inch) purge system to be blind flanged while at power.
	128	Not used.
	129	Not used.
	130	Not used.
CL	131	This SR is modified to be consistent with CTS and proposed ITS 3.6.3 Bases which requires the inservice (18-inch) containment purge system to be blind flanged while at power except when in use. This change also states that the blind flanges are included in the Containment Leak Rate Testing Program.
TA	132	This change incorporates TSTF-45, Revision 2.
	133	Not used.
TA	134	This change incorporates TSTF-46, Revision 1.

Difference Category	Difference Number 3.6-	Justification for Differences
	135	Not used.
CL	136	The NUREG-1431 Bases for this SR indicate that it is applicable to subatmospheric containments. Since PI has a dual containment design, this SR is not included.
CL	137	This SR only applies to the inservice purge system since CTS and the proposed PI ITS require the containment purge system to be blind flanged during plant operation. Normally the inservice purge system is blind flanged and the isolation valves are not relied upon as containment barriers. However the system may be operated providing the isolation valves are first leakage rate tested. Thus this SR requires leakage rate testing of the inservice purge valves with resilient seals prior to use of the system. Since this SR does not have a fixed Frequency, the discussion of additional leakage rate testing and the potential for the seal to degrade is not appropriate and is not included.
	138	Not used.
	139	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
	140	Not used.
CL	141	CTS require this surveillance to be performed each refueling outage. Since the PI ITS proposes to extend the refueling outage cycle to 24 months, this SR Frequency has been changed to 24 months.
CL	142	The NUREG-1431 Bases for this SR indicate that it is applicable to units with resilient seal purge valves allowed to be open during MODE 1, 2, 3, or 4 and having blocking devices on the valves that are not permanently installed. Since the containment purge and inservice containment purge system are blind flanged during MODES 1, 2, 3, and 4, and there are no blocking devices, this SR is not applicable and is not included.
CL	143	The minimum pressure specification is not included since the plant design includes a vacuum breaker system which automatically limits the minimum containment pressure. The vacuum breakers and associated requirements are addressed as a separate Specification in LCO 3.6.8 and the associated Bases. The CTS maximum pressure limit of +2.0 psig is included in LCO 3.6.4.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	144	The allowed Completion Time for Action A.1 is specified as 8 hours as required by CTS for PI. Since under normal operating conditions containment pressure would change at a slow rate due to the large volume of containment and there is a low probability of an accident during this time, the CTS allowed Completion Time of 8 hours will adequately protect the plant from an overpressure condition. This change is consistent with the PI CTS.
	145	Not used.
CL	146	NUREG-1431 Specification 3.6.6A is included as the appropriate Containment Spray and Cooling Systems specification since PI takes credit for iodine removal by Containment Spray. The parenthetical statement that this specification takes credit for iodine removal has not been included since it is for writer guidance only.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	147	The Completion Time limit of "10 days from the discovery of failure to meet the LCO" was not included in the proposed ITS Specifications and Bases since PI CTS do not include this requirement. The intent of adding this limit to the Completion Time is to prevent a plant from continuously being in the LCO without ever meeting the full system requirements. This abuse of the LCO is best handled under plant procedures since the addition of this limit to the Completion Time requirements creates confusion among licensed personnel. Providing this limit can still result in LCO abuse since the systems could all be declared OPERABLE for only a few minutes and then the LCO immediately entered again. Sufficient NRC guidance already exists with respect to extensive use of LCO time such as NRC Temporary Inspection Procedure 2515/126, "Evaluation of On-Line Maintenance". In addition, the Maintenance Rule (10CFR50.65) requires monitoring of equipment performance. Also, review of system availability for the PI IPE from 1978 to 1986 showed that these systems were unavailable less than 1% of the time which demonstrates that this limit is unnecessary.
	148	Not used.
	149	Not used.
	150	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	151	The bracketed term "required" referring to the Containment Cooling System Train has not been included. PI has only two trains of Containment Cooling and both trains are required to be operable by TS. Therefore, the term "required" is unnecessary.
CL	152	CTS and the supporting analyses do not allow both trains of Containment Cooling to be inoperable; thus, NUREG-1431 LCO 3.6.6A Condition D and associated Bases are not included in the PI ITS. Accordingly, the proposed ITS LCO 3.6.5 Condition D (NUREG-1431 LCO 3.6.6A Condition E) has been corrected to delete reference to the Condition which would allow both Containment Cooling trains to be inoperable. Since PI analyses require a minimum of one train of Containment Cooling and one train of Containment Spray when in MODES 1, 2, 3, and 4, and since the rules of use for these proposed ITS require entering LCO 3.0.3 when an associated ACTION is not provided, NUREG-1431 LCO 3.6.6A Condition F is unnecessary and has not been included.
CL	153	Each train of Containment Cooling at PI has two fan coil units which are required to be operable for the train to be OPERABLE. Thus the bracketed term "required" has not been included since it is unnecessary.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	154	This SR requires the fans to operate on low motor speed to implement the requirements of the CTS. The SI signal will shift these units to low speed following an accident if they are not already operating in low speed; thus this requirement is appropriate.
	155	Not used.
PA	156	The phrase, "to each cooling unit" is included to make these requirements clearer for the plant operators. This phraseology is consistent with CTS requirements.
PA	157	Since PI has been operating for many years, the NUREG-1431 requirement to perform this test at the first refueling is unnecessary and has not been included.
PA	158	The clause "containment spray inlet valves closed" is not included. This terminology is not specific to any valves at PI and may unnecessarily restrict the testing methodology. The clause "of any solution" is not necessary for understanding the sentence and is not included.
	159	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
	160	Not used.
CL	161	The allowable Completion Time has been reduced to 24 hours to implement the provisions of the CTS. Since the Spray Additive Tank is common to both trains, its inoperability may make both trains of Containment Spray inoperable. The allowable Completion Time of 24 hours is acceptable considering that the probability of an accident occurring which requires the Spray Additive Tank is low during this time and 24 hours is a reasonable length of time to take corrective action.
CL	162	The maximum volume of spray additive solution is not included. The PI Spray Additive Tanks have a limited additional volume above the required level; thus if the tank were full to the top and the whole volume were injected, the pH would still be within its required limits. Thus the maximum Spray Additive Tank level is not of concern and is not specified.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	163	CTS do not require this test and no spray additive flow rate testing is currently performed. The design of the system ensures that the correct pH level is established in the borated water solution provided by the Containment Spray System providing the spray additive valves fully open. Testing of both spray additive control valves currently includes quarterly stroke timing and visual verification of valve opening once per year. Flowrate testing would be physically possible but very difficult since it would contaminate the containment spray system piping and RWST with NaOH, which would need to be cleaned up; thus this SR has not been included.
CL	164	NUREG-1431 Specification 3.6.8 and Bases are included since PI has permanently installed containment hydrogen recombiners. The parenthetical statement that this specification is applicable if hydrogen recombiners are permanently installed has not been included since it is for writer guidance only.
	165	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	166	Since PI does not take credit for a Hydrogen Purge System and does not have an installed alternative means of controlling hydrogen, this Condition with provision for two hydrogen recombiners inoperable is inappropriate and therefore is not included. If two hydrogen recombiners are inoperable, PI would enter LCO 3.0.3. Likewise, Bases discussion of a Hydrogen Purge System or alternative hydrogen control measures is not included.
CL	167	Although the PI design is most closely represented by the NUREG-1431 "Dual" containment category, it is equipped with a Vacuum Breaker System comprising two vacuum breaker trains. Each train includes a vacuum breaker and automatic containment isolation valves. Thus this specification is applicable. The title has been changed to Vacuum Breaker System since the specification addresses more than just vacuum relief valves. Also the parenthetical containment design classifications have not been included.
CL	168	NUREG-1431 Specification and Bases 3.6.9, "Hydrogen Mixing System" is not included in the PI ITS. CTS does not include this system; thus ISTS Specification and Bases 3.6.9 is not included.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	169	PI has a dual containment system. Thus the following Specifications and Bases that are only applicable to Atmospheric, Subatmospheric or Ice Condenser containments are not included in the PI ITS: 3.6.10; 3.6.11; 3.6.14; 3.6.15; 3.6.16; 3.6.17; and 3.6.18.
	170	Not used.
PA	171	The PI vacuum relief design comprises two trains, each with piping, valves and actuation circuitry. Thus the terminology "vacuum breaker trains" is more correct than "relief lines". This change has been made throughout this Specification and the associated Bases.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	172	The PI vacuum relief system performs two essential functions: relief of containment vacuum and post-accident containment isolation. Thus Conditions A and B of this specification implement the CTS requirements to perform these two essential functions. The associated Required Actions and Completion Times are also consistent with CTS requirements. The Bases have been modified as required to support this change. This change is acceptable because this specification ensures that containment will isolate during an accident consistent with the requirements of PI ITS Specification 3.6.3.
CL	173	SR 3.6.8.1 has been revised to incorporate the CTS requirements for vacuum breaker train functional testing in CTS Table 4.1-1C, Functional Unit 10, 4.4.C and the setpoint required by CTS Table 3.5-1, Functional Unit 7. The test Frequency requirement is 92 days to be consistent with CTS 4.4.C requirements.
PA	174	The plant title for the system that draws a vacuum on the shield building annulus and filters the air is the Shield Building Ventilation System. To facilitate operator familiarity with this terminology, this title and its abbreviation, SBVS, is used throughout this Specification and associated Bases.

Difference Category	Difference Number 3.6-	Justification for Differences
	175	Not used.
CL	176	Since the PI SBVS design does not have filter bypass dampers, ISTS SR 3.6.13.4 is not included and instead, CTS SR 4.4.E requirements are included.
CL	177	The PI SBVS design does not require a specified flow rate to achieve its design objectives; thus ISTS SR 3.6.13.5 is not applicable and is not included in the PI ITS. The system is required to develop a negative pressure in the annulus of -2.0 inches water gauge during a DBA and maintain an equilibrium negative pressure of at least -1.82 inches water gage in order to perform its function. Therefore CTS SR 4.4.B.1 is included which requires demonstration that the specified negative pressure is produced. The requirement to maintain -1.82 inches water gage, from CTS Bases, is also included in the SR and further discussed in the ITS Bases. The Frequency for this SR is specified as 31 days for consistency with CTS requirements. These CTS SR requirements are similar to ISTS SR 3.6.19.4 requirements and have been included in the SBVS Specification for operator convenience, rather than include them with Shield Building SRs. CTS requires the SBVS to be OPERABLE for the Shield Building to be considered OPERABLE. Thus a separate test in PI Specification 3.6.10 is not appropriate.

Difference Category	Difference Number 3.6-	Justification for Differences
	178	Not used.
	179	Not used.
	180	Not used.
CL	181	A new SR 3.6.8.2 has been included to incorporate CTS Table 4.1-1C Functional Unit 10 requirements to perform CHANNEL CALIBRATION on each vacuum breaker train. The test Frequency requirement is 24 months to be consistent with CTS which requires calibration on a refueling outage frequency.
CL	182	The PI Shield Building and SBVS design do not maintain a negative pressure in the annulus during normal operating conditions; thus ISTS SR 3.6.19.1 is not included in the PI ITS.
TA	183	This change incorporates TSTF-18, Revision 1.
CL	184	CTS do not require a structural inspection of the shield building and therefore this requirement is not included in the ITS.

Difference Category	Difference Number 3.6-	Justification for Differences
	185	Not used.
PA	186	During the development of ITS, certain wording preferences, English conventions, reformatting, renumbering, providing additional descriptive information as related to PI, or editorial rewording consistent with plant specific nomenclature, system names, design, or current licensing bases were adopted. As a result of these changes, the TS should be more readily readable by, and therefore understandable to plant operators and other users. During this process, no technical changes were made to the TS unless they were identified and justified.
PA	187	PI specific design features for the containment, shield building and annulus are provided to make the Bases consistent with the PI design.
PA	188	PI does not have any pressurized sealing mechanisms for containment penetrations; thus this bracketed material is not included.
	189	Not used.
	190	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	191	The Bases Applicable Safety Analyses discussion has been revised to be accurate with respect to the PI specific analyses. NUREG-1431 discussion which does not apply to PI is not included.
CL	192	PI defines P_a as the "containment design maximum internal pressure" and uses this as the pressure at which L_a is defined. This is also the containment leakrate test pressure. Thus, this terminology is used throughout these Bases. The "calculated peak containment internal pressure" is not defined and therefore not included.
CL	193	PI containment design leakage is not used, thus the assumed leakage of 0.25% is used and the terminology has been revised accordingly.
CL	194	PI does not have control room alarms indicating when the airlock interlock has been defeated, therefore this discussion has not been included.
	195	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	196	Clarification is provided consistent with CTS interpretations on the components that are part of the interlock.
PA	197	Clarification if provided that an airlock is not inoperable when it is used for normal entry or exit.
	198	Not used.
	199	Not used.
	200	Not used.
PA	201	Clarification is provided that control room indication is an acceptable verification of a closed airlock door.
PA	202	Clarification is provided for the operators on when this Condition applies and acceptable means of meeting the Required Actions.
PA	203	Clarification is provided for the operators that a check valve with flow through the valves secured means that the flow is stopped by the check valve.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	204	The clause "Check valves, or other" has not been included, since in the PI design basis does not consider check valves to be active devices.
	205	Not used.
PA	206	Clarification from 10 CFR 50 Appendix A and the USAR is provided for the operators on what is a closed system.
CL	207	New discussion is provided on the design and function of the PI containment isolation system since it differs from the system as described in NUREG-1431. Accordingly, the description provided in NUREG-1431 is not included.
	208	Not used.
	209	Not used.
	210	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	211	An introductory paragraph is included for the purge system discussion to provide better flow in the text.
CL	212	The discussion of the Containment Purge and Inservice Purge Systems was revised to reflect the PI design and usage.
PA	213	Clarification is provided on the components to which this specification applies.
PA	214	Clarification from current interpretations of TS on the role of caps on vents and drains as part of containment isolation.
	215	Not used.
PA	216	Clarification is provided to make this Bases discussion consistent with the requirements of Note 4 in the Specification.
PA	217	Since vacuum breakers provide a unique type of containment isolation, guidance is provided which directs the operators to 3.6.8 Bases.

Difference Category	Difference Number 3.6-	Justification for Differences
	218	Not used.
	219	Not used.
	220	Not used.
CL	221	Within the PI current licensing basis, one system, the CVCS, does isolate the affected penetration flow path, thus this exception is stated.
PA	222	Guidance is provided for the operators on acceptable means for verification of flow path isolation.
PA	223	The Bases have been revised to be consistent with the SR stated requirements.
PA	224	This SR only applies when the plant is in MODE 5; thus the discussion of MODES 1, 2, 3 and 4 is irrelevant and is not included.
	225	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	227	Design Basis Accident (DBA) has been replaced with Loss of Coolant Accident (LOCA) and Steam Line Break (SLB) to make it clear which accidents are considerations for containment pressurization.
	228	Not used.
	229	Not used.
	230	Not used.
CL	231	Reference to the General Design Criteria (GDC) contained in 10CFR50 Appendix A is replaced by reference to the Atomic Energy Commission (AEC) proposed GDC which is the PI licensing basis. PI was licensed to the proposed AEC GDC which pre-dated the 10CFR50 App A GDC. Some text changes have been made in some locations to conform to the actual requirements of the AEC GDC.
CL	232	At PI, Containment Spray and Containment Cooling do not provide redundancy; therefore any discussion indicating they do has not been included.
CL	233	At PI, the Containment Spray System does not operate during the post accident recirculation mode; therefore these discussions are not included.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	234	Since the Containment Spray (CS) and Containment Cooling Systems do not provide redundant cooling capability at PI, this discussion was revised. Each train of CS provides 100% of the CS heat removal capability. Containment Cooling is also required to provide heat removal.
	235	Not used.
CL	236	The use of the term "inject" implies that some motive force is applied to push the NaOH into the containment spray flow. At PI, the Spray Additive System is a gravity feed system and does not forcibly "inject" into the spray; therefore this term has been changed to "mixes".
CL	237	This was revised to reference PI specific instrumentation, design features and procedures.
	238	PI does not have ECCS automatic containment sump isolation valves which are tested in accordance with SR 3.5.2.5; thus, this paragraph is not included in the ITS.
	239	Not used.
	240	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	241	Requirements relocated from CTS 4.5 have been included.
CL	242	This discussion was revised to be accurate for the PI design features and procedures. Since the Containment Spray and Containment Cooling Systems do not provide redundant cooling capability at PI, this discussion was clarified. Each train of Containment Cooling provides 100% of the Containment Cooling System heat removal capability. Containment Spray is also required to provide heat removal.
CL	243	At PI these may normally be run at either speed; thus "normal" has not been included.
CL	244	The detailed statements relocated from CTS 3.3.B have been included in this Bases.
	245	Not used.
PA	246	This discussion has been modified to be consistent with Specification 3.6.5 Required Actions B.1 and B.2 required Completion Times.

Difference Category	Difference Number 3.6-	Justification for Differences
PA	247	Clarification is provided for the operators on the components that provide iodine and heat removal capability.
	248	Not used.
	249	Not used.
	250	Not used.
CL	251	"preferred" is not included since this is not just a preference; it is a licensed design feature of the plant.
CL	252	The site specific parameters have been included.
	253	Not used.
CL	254	PI uses a gravity feed system; thus the eductor feed system description is not included. The gravity feed description has been revised to be accurate for the PI design and use of the Spray Additive System.
	255	Not used.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	256	The Bases LCO statement has been modified to make it more concise and provide clear guidance to the operators on what is required for the system to be OPERABLE. Since PI does not use containment spray in the post accident recirculation phase, this discussion has been revised to be accurate for PI.
PA	257	The phrase "pressure and temperature conditions" has been replaced with "driving force" to be consistent with other specification Bases and the fact that pressure is not reduced in MODE 3.
	258	Not used.
	259	Not used.
	260	Not used.
CL	261	Discussion of steam line breaks is not included in this Bases since the PI USAR only discusses LOCA as an accident that produces hydrogen in sufficient quantity to be of concern.
CL	262	The PI hydrogen recombiner controls are located in the auxiliary building; thus this discussion has been corrected.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	263	The PI USAR and the Means Mechanical Engineering Handbook define 4.0% as the lower flammability limit for hydrogen; therefore the limit in this Bases has been changed to 4.0%.
	264	Not used.
	265	Not used.
PA	266	The LCO Bases have been supplemented with a statement to provide concise, clear guidance on OPERABILITY of the hydrogen recombiner.
CL	267	Requirements from CTS 4.4.I have been relocated to this Bases.
	268	Not used.
	269	Not used.
PA	270	For completeness, Containment Cooling has been included since this is also a containment cooling feature.

Difference Category	Difference Number 3.6-	Justification for Differences
CL	271	PI specific design description of the vacuum breaker system is included.
PA	272	The LCO Bases has been supplemented with a statement to provide concise, clear guidance on OPERABILITY of a vacuum breaker train.
CL	273	"Quench Spray" is not included since PI does not have this system.
CL	274	Modifications have been made to these Bases to accurately describe the PI SBVS. At PI this system is normally not operating and does not have bypass capability; thus these statements have been revised or not included.
	275	Not used.
PA	276	The LCO Bases has been supplemented with a statement to provide concise, clear guidance on OPERABILITY of a SBVS train.
PA	277	The statement regarding components in degraded condition has been revised to be clearer for the operators.

Difference Category	Difference Number 3.6-	Justification for Differences
	278	Not used.
	279	Not used.
	280	Not used.
CL	281	The PI SBVS has heaters; therefore the discussion for systems without heaters is not included. To facilitate flow of the discussion, the benefits of periodic operation have been relocated within the paragraph.
CL	282	PI is not committed to Regulatory Guide 1.52; thus this reference has been deleted. The applicable standards for PI will be referenced in the VFTP.
PA	283	At PI, testing during plant operation is not likely to result in an unplanned transient; thus this discussion is not included.
CL	284	Requirements from CTS Definitions have been relocated to this Bases. This provides additional guidance on when the Shield Building is operable. The CTS definition has been modified to make it useful in the Bases LCO discussion.

PACKAGE 3.6

CONTAINMENT SYSTEMS

PART G

NO SIGNIFICANT HAZARDS DETERMINATION (NSHD)

and

ENVIRONMENTAL ASSESSMENT

for

CHANGES TO PRAIRIE ISLAND CURRENT TECHNICAL SPECIFICATIONS

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 AND 2

Improved Technical Specifications
Conversion Submittal

Part G

PACKAGE 3.6

CONTAINMENT SYSTEMS

NO SIGNIFICANT HAZARDS DETERMINATION AND ENVIRONMENTAL ASSESSMENT

NO SIGNIFICANT HAZARDS DETERMINATION

The proposed changes to the Operating License have been evaluated to determine whether they constitute a significant hazards consideration as required by 10CFR Part 50, Section 50.91 using the standards provided in Section 50.92.

For ease of review, the changes are evaluated in groupings according to the type of change involved. A single generic evaluation may suffice for some of the changes while others may require specific evaluation in which case the appropriate reference change numbers are provided.

A - Administrative (GENERIC NSHD)
(A3.6-03, A3.6-08, A3.6-09, A3.6-11, A3.6-23, A3.6-24, A3.6-26, A3.6-39, A3.6-47)

Most administrative changes have not been marked-up in the Current Technical Specifications, and may not be specifically referenced to a discussion of change. This No Significant Hazards Determination (NSHD) may be referenced in a discussion of change by the prefix "A" if the change is not obviously an administrative change and requires an explanation.

These proposed changes are editorial in nature. They involve reformatting, renaming, renumbering, or rewording of existing Technical Specifications to provide consistency with NUREG-1431 or conformance with the Writer's Guide, or change of current plant terminology to conform to NUREG-1431. Some administrative changes involve relocation of requirements within the Technical Specifications without affecting their technical content. Clarifications within the new Prairie Island Improved Technical Specifications which do not impose new requirements on plant operation are also considered administrative.

A – Administrative (continued)

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed conversion of Prairie Island Current Technical Specifications to conform to NUREG-1431 involves reformatting, rewording, changes in terminology and relocating requirements. These changes are simply editorial, or do not involve technical changes and thus they do not impact any initiators of previously analyzed events or assumed mitigation of accident or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   These proposed administrative changes do not involve physical modification of the plant, no new or different type of equipment will be installed or removed associated with these administrative changes, nor will there be changes in parameters governing normal plant operation. The proposed administrative changes do not impose new or different requirements on plant operation. Therefore, these administrative changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   These proposed administrative changes do not impact any safety analysis assumptions. Therefore, these changes do not involve a reduction in the plant margin of safety.

M - More restrictive (GENERIC NSHD)
(M3.6-04, M3.6-13, M3.6-14, M3.6-17, M3.6-22, M3.6-31, M3.6-32, M3.6-34, M3.6-37, M3.6-41, M3.6-42, M3.6-44, M3.6-51, M3.6-52, M3.6-61)

This proposed Technical Specifications revision involves modifying the Current Technical Specifications to impose more stringent requirements upon plant operations to achieve consistency with the guidance of NUREG-1431, correct discrepancies or remove ambiguities from the specifications. These more restrictive Technical Specifications have been evaluated against the plant design, safety analyses, and other Technical Specifications requirements to ensure the plant will continue to operate safely with these more stringent specifications.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed changes provide more stringent requirements for operation of the plant. These more stringent requirements do not result in operation that will increase the probability of initiating an analyzed event and do not alter assumptions relative to mitigation of an accident or transient event.

   These more restrictive requirements continue to ensure process variables, structures, systems, and components are maintained consistent with the safety analyses and licensing basis. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed changes do not involve a physical alteration of the plant, that is, no new or different type of equipment will be installed, nor do they change the methods governing normal plant operation.

   These more stringent requirements do impose different operating restrictions. However, these operating restrictions are consistent with the boundaries established by the assumptions made in the plant safety analyses and licensing bases. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

M - More restrictive (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The imposition of more stringent requirements on plant operation either has no impact on the plant margin of safety or increases the margin of safety. Each change in this category is by definition providing additional restrictions to enhance plant safety by:

   a) increasing the analytical or safety limit;
   b) increasing the scope of the specifications to include additional plant equipment;
   c) adding requirements to current specifications;
   d) increasing the applicability of the specification;
   e) providing additional actions;
   f) decreasing restoration times;
   g) imposing new surveillances; or
   h) decreasing surveillance intervals.

   These changes maintain requirements within the plant safety analyses and licensing bases. Therefore, these changes do not involve a significant reduction in a margin of safety.

R - Relocation (GENERIC NSHD)
(None in this package)

This License Amendment Request (LAR) proposes to relocate requirements contained in the Current Technical Specifications out of the Technical Specifications into licensee controlled programs. These requirements are relocated because they 1) do not meet the Technical Specifications selection criteria defined in 10 CFR 50.36; or 2) are mandated by current Nuclear Regulatory Commission (NRC) regulations and are therefore unnecessary in the Technical Specifications.

In the NRC Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors (dated 7/16/93), the NRC stated:

> . . . since 1969, there has been a trend towards including in Technical Specifications not only those requirements derived from the analyses and evaluations included in the safety analysis report but also essentially all other Commission requirements governing the operation of nuclear power reactors. . . This has contributed to the volume of Technical Specifications and to the several-fold increase, since 1969, in the number of license amendment applications to effect changes to the Technical Specifications. It has diverted both staff and licensee attention from the more important requirements in these documents to the extent that it has resulted in an adverse but unquantifiable impact on safety.

Thus, relocation of unnecessary requirements from the Current Technical Specifications should result in an overall improvement in plant safety through more focused attention to the requirements that are most important to plant safety.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   These proposed changes relocate requirements for structures, systems, components or variables which did not meet the criteria for inclusion in the improved Technical Specifications, or which duplicate regulatory requirements. The affected structures, systems, components or variables are not assumed to be initiators of analyzed events and are not assumed to mitigate accident or transient events.

Relocation (continued)

These relocated operability requirements will continue to be maintained pursuant to 10 CFR 50.59, other regulatory requirements (as applicable for the document to which the requirement is relocated), or the Administrative Controls section of these proposed improved Technical Specifications.

Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   These proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed changes do not impose any different requirements and adequate control of existing requirements will be maintained. Thus, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   These proposed changes will not reduce the margin of safety because they do not impact any safety analysis assumptions. In addition, the relocated requirements for the affected structure, system, component or variables are the same as the current Technical Specifications. Since future changes to these requirements will be evaluated per the requirements of 10 CFR 50.59, other regulatory requirements (as applicable for the document to which the requirement is relocated), or the Administrative Controls section of the Improved Technical Specifications, proper controls are in place to maintain the plant margin of safety. Therefore, these changes do not involve a significant reduction in the margin of safety.

LR - Less restrictive, Relocated details (GENERIC NSHD)
(LR3.6-01, LR3.6-02, LR3.6-06, LR3.6-07, LR3.6-16, LR3.6-36, LR3.6-56, LR3.6-57, LR3.6-64, LR3.6-66, LR3.6-67, LR3.6-71, LR3.6-72, LR3.6-73)

Some information in the Prairie Island Current Technical Specifications that is descriptive in nature regarding the equipment, system(s), actions or surveillances identified by the specification has been removed from the proposed specification and relocated to the proposed Bases, Updated Safety Analysis Report or licensee controlled procedures. The relocation of this descriptive information to the Bases of the Improved Technical Specifications, Updated Safety Analysis Report or licensee controlled procedures is acceptable because these documents will be controlled by the Improved Technical Specifications required programs, procedures or 10CFR50.59. Therefore, the descriptive information that has been moved continues to be maintained in an appropriately controlled manner.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed changes relocate detailed, descriptive requirements from the Technical Specifications to the Bases, Updated Safety Analysis Report or licensee controlled procedures. These documents containing the relocated requirements will be maintained under the provisions of 10CFR50.59, a program or procedure based on 10CFR50.59 evaluation of changes, or NRC approved methodologies. Since these documents to which the Technical Specifications requirements have been relocated are evaluated under 10CFR50.59 or its guidance, or in accordance with NRC approved methodologies, no increase in the probability or consequences of an accident previously evaluate will be allowed without prior NRC approval. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   These proposed changes do not necessitate physical alteration of the plant, that is, no new or different type of equipment will be installed, or change parameters governing normal plant operation. The proposed changes will not impose any different requirements and adequate control of the information will be maintained. Thus, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

LR - Less restrictive, Relocated details (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed changes will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the Technical Specifications to the Bases, Updated Safety Analysis Report or licensee controlled procedures are the same as the existing Technical Specifications. Since future changes to these requirements will be evaluated under 10CFR50.59 or its guidance, or in accordance with NRC approved methodologies, no reduction in a margin of safety will be allowed without prior NRC approval. Therefore, these changes do not involve a significant reduction in a margin of safety.

L - Less restrictive, Specific

Each CTS change which is designated as Less (L prefix) restrictive on plant operations is provided with a specific NSHD.

Specific NSHD for Change L3.6-12

CTS require an affected unit to be taken to MODE 5 from MODE 3 within 30 hours when an inoperable containment spray train or the spray additive system is not restored to OPERABLE status within the allowed outage time. Due to the reduced driving force for release of radioactive material from the RCS in MODE 3, this proposed change extends the interval for taking the unit to MODE 5 from MODE 3 to 78 hours, thus allowing an additional 48 hours in MODE 3. This change is consistent with the guidance of NUREG-1431.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change involves extending the time allowed to take the unit to MODE 5 from MODE 3 from 30 hours to 78 hours when an inoperable containment spray train or the spray additive system is not restored to OPERABLE status within the allowed outage time. The containment spray and spray additive systems are not assumed to be accident initiators in any accident analyses; thus this change does not involve an increase in the probability of an accident. The proposed specifications require the unit to be placed in MODE 3 within 6 hours which is consistent with CTS requirements. When the plant is in MODE 3 the driving force for release of radioactive material is reduced; therefore this change does not involve a significant increase in the consequences of an accident by allowing an additional 48 hours to place the unit in MODE 5. Also the probability of an accident requiring containment spray or spray additive during the additional 48 hours is low.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and does not involve a physical alteration of the plant(no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident.

Specific NSHD for Change L3.6-12 (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and does not involve a significant reduction in margin of safety. The effect of this change is to allow the unit to be in MODE 3 for an additional 48 hours when a containment spray train or the spray additive system is inoperable. This does not involve a significant reduction in the margin of safety because in MODE 3 the driving force for release of radioactive materials is reduced. Since the additional allowed 48 hours may provide the plant with time to restore the containment spray or spray additive system to OPERABILITY, any decrease in the margin of safety is somewhat offset by the opportunity to avoid further power reduction and the associated plant evolutions. Considering the low probability of an event that would require containment spray or spray additive, the proposed change is acceptable and any reduction in the margin of safety is insignificant.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-21

CTS allow containment isolation non-automatic valves to be open if they are under direct administrative control and capable of being closed within one minute following an accident. For consistency with NUREG-1431, the PI ITS does not specify a specific time in which these valves are required to be closed. The proposed ITS retains the requirement for direct administrative control consisting of a dedicated operator at the valve in continuous communication with the control room; thus the change is functionally equivalent to CTS requirements and provides protection equivalent to the automatic isolation system.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change involves deleting time restrictions on closure of non-automatic containment isolation valves for consistency with NUREG-1431 and does not involve any hardware changes. The containment isolation valves are not assumed to be an initiator of any analyzed event; therefore this change does not involve an increase in the probability of a previously evaluated accident. The proposed change still ensures the isolation valves will perform their required function and limit the consequences of design basis events as described in the USAR and that the results of the analyses in the USAR remain bounding. Furthermore, the proposed change does not impose any new safety analyses limits or alter the plant's ability to detect and mitigate events. Therefore, this change does not involve a significant increase in the consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and does not involve a physical alteration of the plant(no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident.

Specific NSHD for Change L3.6-21 (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and does not involve a significant reduction in margin of safety. The proposed change has been developed considering the importance of the containment isolation function in limiting the consequences of a design basis event and concern for the plant's ability to perform required operational support functions with the necessary systems isolated. The proposed change allows for protection equivalent to that provided by an automatic isolation system. Considering the low probability of an event that would challenge the containment boundary, the protection provided by this change and the operational requirements to occasionally open these valves, the proposed change is acceptable and any reduction in the margin of safety is insignificant.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-27

The proposed change would allow use of a blind flange or check valve with flow through it secured as alternative means of isolating an inoperable containment isolation valve. This change is acceptable since these alternative methods provide equivalent penetration isolation capability.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change involves use of alternative containment penetration isolation barriers for consistency with NUREG-1431 and does not involve any hardware changes. The containment isolation valves are not assumed to be an initiator of any analyzed event; therefore this change does not involve an increase in the probability of a previously evaluated accident. The proposed change still ensures the containment penetrations are isolated and will perform their required function. The proposed change does not impose any new safety analyses limits or alter the plant's ability to detect and mitigate events. Therefore, this change does not involve a significant increase in the consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident.

Specific NSHD for Change L3.6-27 (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change makes the PI ITS consistent with the guidance of NUREG-1431 and allows use of alternative means of isolating containment penetrations. These alternative means provide isolation capability equivalent to that provided by isolation valves as specified in the CTS. Thus, this change does not involve a significant reduction in the margin of safety.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-33

The proposed change incorporates provisions from NUREG-1431 and TSTF-30 which specify separate required actions for isolating inoperable penetration barriers when a closed system inside containment is involved. This change is acceptable based on the continuous containment isolation provided by the closed system.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change allows a closed system to be used to isolate a penetration with an inoperable containment isolation valve for up to 72 hours. The containment isolation system is not considered as an initiator for any accidents previously analyzed. Therefore, this change does not significantly increase the probability of a previously analyzed accident. The proposed change does not further degrade the capability of the containment isolation system to perform its required function under these circumstances since the closed system is a passive device which is closed to containment and missile protected. Therefore, this change does not involve a significant increase the consequences of an accident.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change does not involve a physical alteration of the plant, that is, no new or different type of equipment will be installed. This proposed change does not introduce any new mode of plant operation or change the methods governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The containment isolation system remains capable of performing its intended function since the closed system is missile protected, leak tested, and capable of maintaining containment integrity in the event of an accident. Therefore the proposed change does not result in a significant reduction in the margin of safety.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-43

This change will allow entry and exit through an inoperable air lock door for up to 7 days under administrative controls if both air locks are inoperable. With both air locks inoperable, containment entry may be required on a periodic basis to perform TS Surveillances and Required actions, as well as other activities on equipment inside containment.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change does not involve any physical plant changes and maintains PI ITS in conformance with NUREG-1431. The containment air locks are not assumed to be initiators of any analyzed accident. The role of the containment air lock is to contain releases inside containment following a DBA and thereby limit accident consequences. The requested change does not allow unrestricted continuous operation in this condition. The proposed change would only apply for 7 days. Furthermore, during the period when this allowance applies, entry and exit is under administrative controls such that in the event of an accident the operable air lock door could be quickly closed, thereby reestablishing containment boundary. Thus, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change does not involve a physical alteration of the plant, that is, no new or different type of equipment will be installed, nor does it change parameters governing normal plant operation. The proposed change will ensure the containment boundary is capable of being maintained. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Specific NSHD for Change L3.6-43 (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change maintains PI ITS in conformance with NUREG-1431 and does not involve a significant reduction in a margin of safety. The allowance to permit entry and exit under administrative controls is acceptable based on the small probability of an event during this 7 day period requiring the containment air lock to mitigate consequences of a DBA. The requested change provides the ability to repair an inoperable air lock door or enter containment to perform surveillances with both air locks inoperable. The exposure of the plant to the small probability of an event requiring the operable containment air lock door to be closed during the short time period it is opened to permit entry and exit under administrative controls is insignificant. Therefore, this change does not involve a significant reduction in margin of safety.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-46

The proposed change allows use of administrative means for verification that an inoperable, locked closed air lock door is closed, if the air lock door is in a high radiation area. Since access to high radiation areas is usually restricted for ALARA reasons, it is unlikely that a door will be mispositioned and administrative verification is acceptable.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change does not involve any physical changes to the plant or operating procedures. The change does conform the PI ITS to the guidance of NUREG-1431. The air locks are passive devices which limit the consequences of accidents and are not assumed to be an initiator of any analyzed event. The proposed change ensures the air locks remain closed to limit the consequences of design basis events as described in the USAR and that the results of the analyses in the USAR remain bounding. Also, the proposed change does not impose any new safety analysis limits or alter the plant's ability to detect and mitigate events. Therefore, this change does not involve a significant increase in the probability or consequences of a previously analyzed accident.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   This proposed change does not involve a physical alteration of the plant, that is, no new or different type of equipment will be installed. The proposed change will only provide administrative means for verification of air lock status consistent with the guidance of NUREG-1431 and does not introduce changes in parameters governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Specific NSHD for Change L3.6-46 (continued)

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change allows use of administrative means for verification of air lock status consistent with the guidance of NUREG-1431 and does not involve a significant reduction in a margin of safety. The proposed change has been developed considering the importance of the air locks in limiting the consequences of a design basis accident and ALARA concerns for the plant personnel The proposed change and ALARA access restrictions still ensure the isolation devices are properly positioned to limit the consequences of a design basis accident.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-53

The proposed change would extend the time for verification of the spray additive tank NaOH concentration from monthly to once every 184 days in accordance with the guidance of NUREG-1431.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The change revises the Frequency for verifying the NaOH concentration in the spray additive tank from monthly to once every 184 days. The spray additive tank is not considered an initiator for any accidents previously analyzed; therefore this change does not significantly increase the probability of a previously analyzed accident. Since the spray additive tank is normally isolated, changes in concentration will be associated with changes in level. The proposed change does not further degrade the capability of the system to perform its required function since the tank is passive with available level indications to the operators which would indicate a change in concentration. Therefore, this change does not significantly increase the consequences of a previously analyzed accident.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed). The proposed change introduces no new mode of plant operation or changes in the methods governing normal plant operation. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The change in Surveillance Frequency does not prevent the spray additive tank from performing its intended safety function. Therefore, this change does not involve a significant reduction in a margin of safety.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This change is consistent with the guidance of NUREG-1431.

Specific NSHD for Change L3.6-63

The proposed change would allow an actual or simulated actuation signal to be used for testing of equipment. This is acceptable since either signal will provide a legitimate basis for determining equipment response.

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change allows actual or simulated signals to be used for test of equipment in conformance with the guidance of NUREG-1431. These tests are to assure that the equipment will function to mitigate the consequences of design basis events. Use of either an actual or simulated signal to perform the surveillance tests does not affect the consequences of a previously evaluated accident. These tests are not assumed to be an event initiator; therefore, this change does not increase the probability of any previously analyzed accident.

   Thus this change does not involve a significant increase in the consequences of a previously analyzed accident.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

   The proposed change allows use of either an actual or simulated actuation signal for test of TS required equipment and does not involve a physical alteration of the plant, that is, no new or different type of equipment will be installed. Nor does it change the operating parameters governing normal plant operation. Thus, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   The proposed change allows either actual or simulated signals to be used for test of equipment in conformance with the guidance of NUREG-1431. Overall, the same test responses will be obtained and the same number of

<u>Specific NSHD for Change L3.6-63</u> (continued)

tests are required to be performed. These tests demonstrate that the TS required equipment will function as required. Thus, the proposed change does not involve a significant reduction in the margin of safety.

Therefore it is concluded this proposed change does not involve a significant hazards consideration. This proposed change is consistent with the guidance of NUREG-1431.

ENVIRONMENTAL ASSESSMENT

The Nuclear Management Company has evaluated the proposed changes and determined that:

1. The changes do not involve a significant hazards consideration, or

2. The changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or

3. The changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR Part 51 Section 51.22(c)(9). Therefore, pursuant to 10 CFR Part 51 Section 51.22(b), an environmental assessment of the proposed changes is not required.