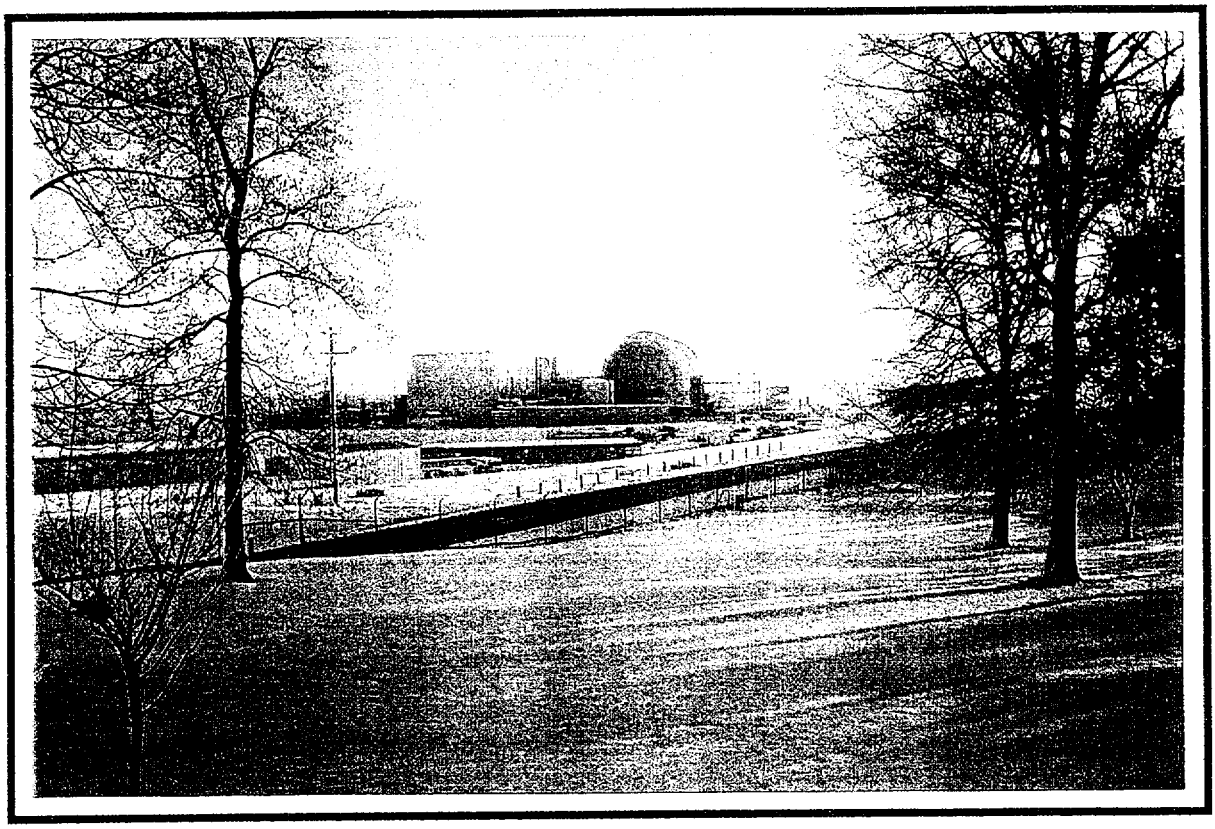
NORTH ANNA POWER STATION

Section 3.6
Containment Systems



VOLUME 14
Improved Technical Specifications

Dominion

NORTH ANNA POWER STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.6 - CONTAINMENT SYSTEMS

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IMPROVED TECHNICAL SPECIFICATIONS

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

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. AND B.2 Be in MODE 5.	6 hours 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.	In accordance with the Containment Leakage Rate Testing Program

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3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Locks

LCO 3.6.2 Two containment air locks 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.

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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. ----------	(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.1	Verify the OPERABLE door is closed in the affected air lock.	1 hour
	AND		
	A.2	Lock the OPERABLE door closed in the affected air lock.	24 hours
	AND		
	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

ACTIONS

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 lock.	Once per 31 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
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 SR 3.6.1.1. ---------- Perform required air lock leakage rate testing in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	24 months

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3.6 CONTAINMENT SYSTEMS

3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

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

ACTIONS

- NOTES -

1. Penetration flow path(s) except for 36 inch purge and exhaust valves, 18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction flow paths may be unisolated intermittently under administrative controls.

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

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

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when leakage for a penetration flow path results in exceeding the overall containment leakage rate acceptance criteria.

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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE--------- Only applicable to penetration flow paths with two or more containment isolation valves. ---------- One or more penetration flow paths with one containment isolation valve inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2 --------NOTES-------- 1. Isolation devices in high radiation areas may be verified by use of administrative means. 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means. ---------- Verify the affected penetration flow path is isolated.	Once per 31 days 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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ---------NOTE--------- Only applicable to penetration flow paths with two or more containment isolation valves. ---------- One or more penetration flow paths with two or more containment isolation valves inoperable.	B.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange.	1 hour
C. ---------NOTE--------- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. ---------- 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 automatic valve, closed manual valve, or blind flange.	72 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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. ---------- Verify each 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.	31 days
SR 3.6.3.2	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each 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.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.3	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.4	Verify each automatic power operated 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.	18 months
SR 3.6.3.5	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

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3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment air partial pressure shall be ≥ 9.0 psia and within the acceptable operation range shown on Figure 3.6.4-1.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment air partial pressure not within limits.	A.1 Restore containment air partial pressure to within limits.	1 hour
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 3.6.4.1	Verify containment air partial pressure is within limits.	12 hours

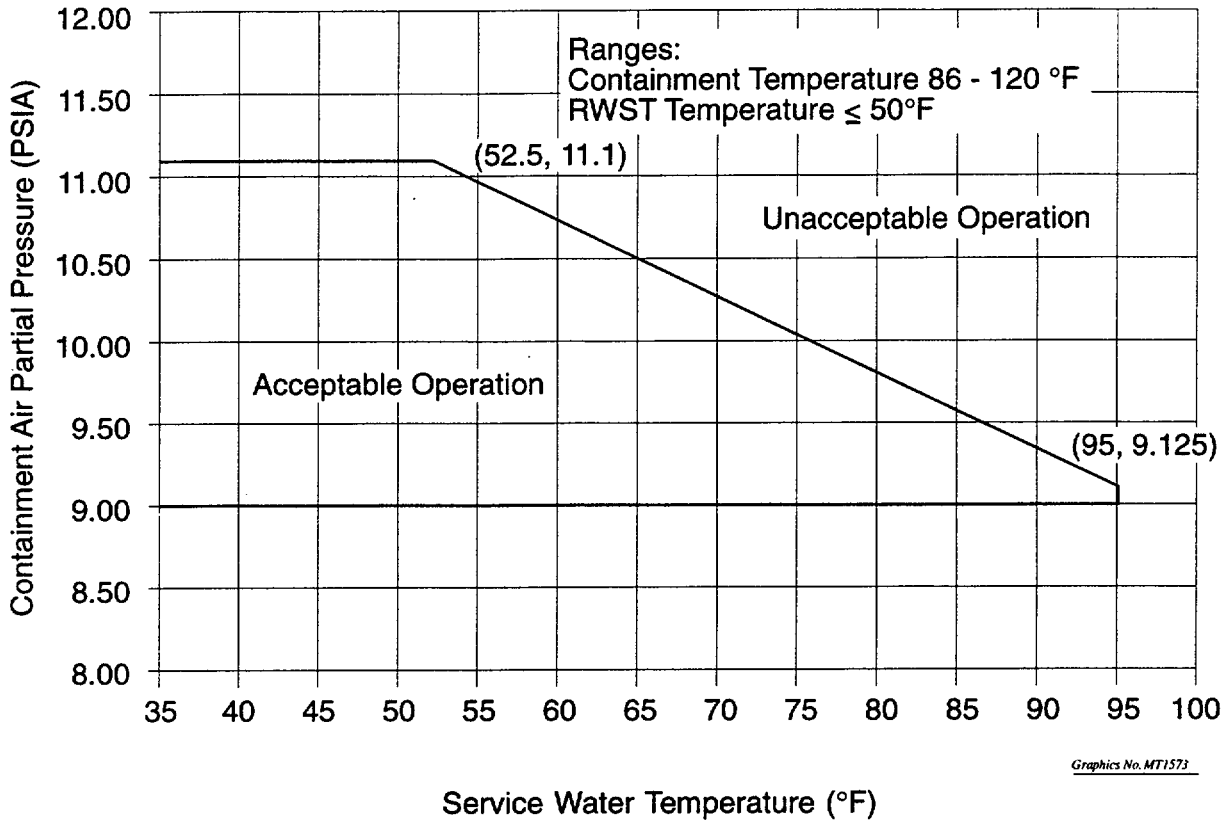

Figure 3.6.4-1 (page 1 of 1)
Containment Air Partial Pressure Versus
Service Water Temperature

3.6 CONTAINMENT SYSTEMS

3.6.5 Containment Air Temperature

LCO 3.6.5 Containment average air temperature shall be ≥ 86°F and ≤ 120°F.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limits.	A.1 Restore containment average air temperature to within limits.	8 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 3.6.5.1	Verify containment average air temperature is within limits.	24 hours

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3.6 CONTAINMENT SYSTEMS

3.6.6 Quench Spray (QS) System

LCO 3.6.6 Two QS trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One QS train inoperable.	A.1 Restore QS train to OPERABLE status.	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 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each QS 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 3.6.6.2	Verify each QS 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.3	Verify each QS 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.	18 months
SR 3.6.6.4	Verify each QS pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.6.5	Verify each spray nozzle is unobstructed.	10 years

3.6 CONTAINMENT SYSTEMS

3.6.7 Recirculation Spray (RS) System

LCO 3.6.7 Four RS subsystems and a casing cooling tank shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RS subsystem inoperable.	A.1 Restore RS subsystem to OPERABLE status.	7 days
B. Two RS subsystems inoperable in one train.	B.1 Restore one RS subsystem to OPERABLE status.	72 hours
C. Two inside RS subsystems inoperable.	C.1 Restore one RS subsystem to OPERABLE status.	72 hours
D. Casing cooling tank inoperable.	D.1 Restore casing cooling tank to OPERABLE status.	72 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 84 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One outside RS subsystem and one inside RS subsystem inoperable and not in the same train. OR Three or more RS subsystems inoperable. OR Two outside RS subsystems inoperable.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.1	Verify casing cooling tank temperature is ≥ 35°F and ≤ 50°F.	24 hours
SR 3.6.7.2	Verify casing cooling tank contained borated water volume is ≥ 116,500 gal.	7 days
SR 3.6.7.3	Verify casing cooling tank boron concentration is ≥ 2300 ppm and ≤ 2400 ppm.	7 days
SR 3.6.7.4	Verify each RS and casing cooling 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 3.6.7.5	Verify each RS and casing cooling 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.7.6	Verify on an actual or simulated actuation signal(s): a. Each RS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position; b. Each RS pump starts automatically; and c. Each casing cooling pump starts automatically.	18 months
SR 3.6.7.7	Verify each spray nozzle is unobstructed.	10 years

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3.6 CONTAINMENT SYSTEMS

3.6.8 Chemical Addition System

LCO 3.6.8 The Chemical Addition System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Chemical Addition System inoperable.	A.1 Restore Chemical Addition System to OPERABLE status.	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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.1	Verify each Chemical Addition System 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 3.6.8.2	Verify chemical addition tank solution volume is ≥ 4800 gal and ≤ 5500 gal.	184 days
SR 3.6.8.3	Verify chemical addition tank NaOH solution concentration is ≥ 12% and ≤ 13% by weight.	184 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.8.4	Verify each Chemical Addition System 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.	18 months
SR 3.6.8.5	Verify Chemical Addition System flow from each solution's flow path.	5 years

3.6 CONTAINMENT SYSTEMS

3.6.9 Hydrogen Recombiners

LCO 3.6.9 Two hydrogen recombiners shall be OPERABLE.

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
B. Two hydrogen recombiners inoperable.	B.1	Verify by administrative means that the hydrogen control function is maintained.	1 hour AND Once per 12 hours thereafter
	AND		
	B.2	Restore one hydrogen recombiner 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 3.6.9.1	Perform a system functional test for each hydrogen recombiner.	18 months
SR 3.6.9.2	Visually examine each hydrogen recombiner enclosure and verify there is no evidence of abnormal conditions.	18 months
SR 3.6.9.3	Perform a resistance to ground test for each heater phase.	18 months

SECTION 3.6 - CONTAINMENT SYSTEMS

IMPROVED TECHNICAL SPECIFICATIONS BASES

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment

BASES

BACKGROUND

The containment consists of the concrete reactor building, its steel liner, and the penetrations through this structure. The structure is designed to contain radioactive material that may be released from the reactor core following a design basis loss of coolant accident (LOCA). Additionally, this structure provides shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment is a reinforced concrete structure with a cylindrical wall, a flat foundation mat, and a hemispherical dome roof. The inside surface of the containment is lined with a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

The concrete reactor building is required for structural integrity of the containment under Design Basis Accident (DBA) conditions. The steel liner 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, Option B (Ref. 1), as modified by approved exemptions.

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";

BASES

BACKGROUND (continued)

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

c. All equipment hatches are closed.

APPLICABLE SAFETY ANALYSES

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

The DBAs that result in a challenge to containment OPERABILITY from high pressures and temperatures are a loss of coolant accident (LOCA), 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 containment was designed with an allowable leakage rate of 0.1% of containment air weight per day (Ref. 3). This leakage rate, used to evaluate offsite doses resulting from accidents, is defined in 10 CFR 50, Appendix J, Option B (Ref. 1), as L_a: the maximum allowable containment leakage rate at the calculated peak containment internal pressure (P_a) resulting from the limiting design basis LOCA. 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 0.1% of containment air weight per day in the safety analyses at P_a = 44.1 psig (Ref. 3).

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).

LCO

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

(continued)

BASES

LCO (continued)

Compliance with this LCO will ensure a containment configuration, including the equipment hatch, 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) 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.

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 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 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 unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Containment Leakage Rate Testing Program. Failure to meet air lock leakage limits specified in LCO 3.6.2 does not invalidate the acceptability of these overall leakage determinations unless their contribution to overall Type A, B, and C leakage causes that to exceed limits. As left leakage prior to the first startup after performing a required Containment Leakage Rate Testing Program, leakage test is required to be $\leq 0.6\ L_a$ for combined Type B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leakage Rate Testing Program. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis.

REFERENCES

1. 10 CFR 50, Appendix J, Option B.

2. UFSAR, Chapter 15.

3. UFSAR, Section 6.2.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.2 Containment Air Locks

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, one of which is 7 ft in diameter, the other 5.75 ft in diameter, with a door at each end. The 5.75 ft diameter equipment hatch escape air lock is an integral part of the containment equipment hatch. 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 Design Basis Accident (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. The inner and outer door of the 7 ft diameter personnel air lock include an 18 inch diameter emergency manway. The manways contain double gasketed seals and local leak rate testing capability to ensure pressure integrity. The manways are to be used only for emergency entrance or exit from the air lock. Operation of the manways of the 7 ft personnel air lock is controlled administratively.

The 7 ft personnel air lock is provided with limit switches on both doors that provide control room alarm of inside or outside door operation. Outside access to the 5.75 ft equipment hatch escape air lock is controlled by an alarmed door to the space outside containment which provides access to the air lock.

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 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.

BASES

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident and a rod ejection accident (Ref. 3). In the 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 containment was designed with an allowable leakage rate of 0.1% of containment air weight per day (Ref. 2). This leakage rate is defined in 10 CFR 50, Appendix J, Option B (Ref. 1), as L_a = 0.1% of containment air weight per day, the maximum allowable containment leakage rate at the calculated peak containment internal pressure P_a = 44.1 psig following a design basis LOCA. 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).

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 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 Type B air lock leakage test, and both air lock doors must be OPERABLE. Opening or closing of the manways of the 7 ft personnel air lock is treated in the same manner as opening or closing of the associated door. The interlock allows only one air lock door of an air lock to be opened at one time. Operation of the manways of the 7 ft personnel air lock is controlled administratively. These provisions ensure 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 entry into or exit from containment.

BASES

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, "Containment Penetrations."

ACTIONS

The ACTIONS are modified by 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. It is preferred that the 7 ft personnel air lock be used for access to Containment due to the size and configuration of the 5.75 ft equipment hatch escape air locks. The equipment hatch escape air lock is typically only used in case of emergency. This 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.

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."

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. 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.

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. 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 entry and exit for 7 days under administrative controls if both air locks have an inoperable door. This 7 day

(continued)

BASES

ACTIONS

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

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 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

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, Required Action C.1 requires action to be initiated immediately to evaluate previous combined leakage rates using current air lock test results. An evaluation 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 limits. 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 unit shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits.

Required Action C.2 requires that one door in the 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 unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

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. This SR reflects the leakage rate testing requirements with regard to air lock leakage (Type B leakage tests). The acceptance criteria were established during 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.

The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria which are applicable to SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the combined Type B and C containment leakage rate.

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 when combined with administrative procedures. Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the containment door is used for entry and exit (procedures require strict adherence to single door opening), this test is only required to be performed every 24 months. The 24 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage, and the potential for loss of containment

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

OPERABILITY if the Surveillance were performed with the reactor at power. The 24 month Frequency is also based on engineering judgment and is considered adequate given that the interlock is not challenged during use of the air lock.

REFERENCES

1. 10 CFR 50, Appendix J, Option B.

2. UFSAR, Section 6.2.

3. UFSAR, Chapter 15.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3 Containment Isolation Valves

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 automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Automatic 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. These barriers (typically containment isolation valves) make up the Containment Isolation System.

Automatic isolation signals are produced during accident conditions. Containment Phase "A" isolation occurs upon receipt of a safety injection signal. The Phase "A" isolation signal isolates nonessential process lines in order to minimize leakage of fission product radioactivity. Containment Phase "B" isolation occurs upon receipt of a containment pressure High-High signal and isolates the remaining process lines, except systems required for accident mitigation.

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.

(continued)

BASES

BACKGROUND (continued)

Containment Purge System (36 inch purge and exhaust valves, 18 inch containment vacuum breaking valve, and 8 inch purge bypass valve)

The Containment 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. The supply and exhaust lines each contain two isolation valves. Because of their large size, the 36 inch purge valves are not qualified for automatic closure from their open position under Design Basis Accident (DBA) conditions. Therefore, the 36 inch purge valves are maintained closed in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained. The 18 inch containment vacuum breaking valve and 8 inch bypass valve are also maintained closed in MODES 1, 2, 3, and 4.

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 containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness 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 within containment are a loss of coolant accident (LOCA) and a rod ejection accident (Ref. 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 inch purge and exhaust valves are closed at event initiation.

The DBA analysis assumes that, within 60 seconds after the accident, isolation of the containment is complete and leakage terminated except for the design leakage rate, La. 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.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The containment isolation valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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 automatic power operated isolation valves are required to have isolation times within limits and to actuate on an automatic isolation signal. The 36, 18, and 8 inch purge valves must be maintained locked, sealed, or otherwise secured closed. The valves covered by this LCO are listed along with their associated stroke times in the Technical Requirements Manual (Ref. 2).

The normally closed isolation valves are considered OPERABLE when manual valves are closed, automatic valves are de-activated and secured in their closed position, blind flanges are in place, and closed systems are intact.

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 a Note allowing penetration flow paths, except for 36 inch purge and exhaust valve, 18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction penetration flow paths, to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who

(continued)

BASES

ACTIONS (continued)

is in continuous 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 fact that the 36 inch valves are not qualified for automatic closure from their open position under DBA conditions and that these and the other penetrations listed as excepted exhaust directly from the containment atmosphere to the environment, the penetration flow path containing these valves may not be opened under administrative controls.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable 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 the leakage for a containment penetration flow path 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.

A.1 and A.2

In the event one containment isolation valve in one or more penetration flow paths is inoperable, the affected penetration flow path must be isolated. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, or a check valve with flow through the valve secured. 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

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

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.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and 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 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 with two or more containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides the appropriate actions.

Required Action A.2 is modified by two Notes. 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

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

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

B.1

With two or more 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 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.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two or more containment isolation 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

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

closed and de-activated automatic valve, a closed manual valve, and a blind flange. Required Action C.1 must be completed within the 72 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 assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. 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.

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths with only one containment isolation valve and a closed system. The closed system must meet the requirements of Reference 3. This Note is necessary since this Condition is written to specifically address those penetration flow paths in a closed system.

Required Action C.2 is modified by two Notes. 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.

BASES

ACTIONS (continued)

D.1 and D.2

If the Required Actions and associated Completion Times are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

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 isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 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 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.

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 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 3.6.3.2

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 valves 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 valves 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.

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. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position, is small.

SR 3.6.3.3

Verifying that the isolation time of each 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.4

Automatic power operated 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 power operated containment isolation valve 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 required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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.

SR 3.6.3.5

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 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.

REFERENCES

1. UFSAR, Chapter 15.

2. Technical Requirements Manual.

3. Standard Review Plan 6.2.4.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4 Containment Pressure

BASES

BACKGROUND

Containment air partial pressure is a process variable that is monitored and controlled. The containment air partial pressure is maintained as a function of refueling water storage tank temperature and service water temperature according to Figure 3.6.4-1 of the LCO, to ensure that, following a Design Basis Accident (DBA), the containment would depressurize in < 60 minutes to subatmospheric conditions. Controlling containment partial pressure within prescribed limits also prevents the containment pressure from exceeding the containment design negative pressure differential with respect to the outside atmosphere in the event of an inadvertent actuation of the Quench Spray (QS) System.

The containment internal air partial pressure limits of Figure 3.6.4-1 are derived from the input conditions used in the containment DBA analyses. Limiting the containment internal air partial pressure and temperature in turn limits the pressure that could be expected following a DBA, thus ensuring containment OPERABILITY. Ensuring containment OPERABILITY limits leakage of fission product radioactivity from containment to the environment.

APPLICABLE SAFETY ANALYSES

Containment air partial pressure is an initial condition used in the containment DBA analyses to establish the maximum peak containment internal pressure. The limiting DBAs considered relative to containment pressure are the loss of coolant accident (LOCA) and steam line break (SLB). The LOCA and SLB are analyzed using computer codes designed to predict the resultant containment pressure transients. DBAs are assumed not to occur simultaneously or consecutively. The postulated DBAs are analyzed assuming degraded containment Engineered Safety Feature (ESF) systems (i.e., assuming no offsite power and the loss of one emergency diesel generator, which is the worst case single active failure, resulting in one train of the QS System and one train of the Recirculation Spray System becoming inoperable). The containment analysis for the DBA (Ref. 1) shows that the maximum peak containment pressure results from the limiting design basis SLB.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The maximum design internal pressure for the containment is 45.0 psig. The initial conditions used in the containment design basis analyses were an air partial pressure of 11.2 psia and an air temperature of 120°F. This resulted in a maximum peak containment internal pressure of 44.9 psig, which is less than the maximum design internal pressure for the containment.

The containment was also designed for an external pressure load of 9.2 psid (i.e., a design minimum pressure of 5.5 psia). The inadvertent actuation of the QS System was analyzed to determine the reduction in containment pressure (Ref. 1). The initial conditions used in the analysis were 8.6 psia and 120°F. This resulted in a minimum pressure inside containment of 7.4 psia, which is considerably above the design minimum of 5.5 psia.

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. For the reflood phase calculations, 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).

LCO

Maintaining containment pressure within the limits shown in Figure 3.6.4-1 of the LCO ensures that in the event of a DBA the resultant peak containment accident pressure will be maintained below the containment design pressure. 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 QS System. The LCO limits also ensure the return to subatmospheric conditions within 60 minutes following a DBA.

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. Since maintaining containment pressure within design basis 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 Reactor Coolant System pressure and temperature 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 air partial pressure is not within the limits of the LCO, containment pressure must be restored to within these limits within 1 hour. The Required Action is necessary to return operation to within the bounds of the containment analysis. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1, "Containment," which requires that containment be restored to OPERABLE status within 1 hour.

B.1 and B.2

If containment air partial pressure cannot be restored to within limits within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

Verifying that containment air partial pressure is within limits ensures that operation remains within the limits assumed in the containment analysis. The 12 hour Frequency of this SR was developed considering operating experience related to trending of containment pressure variations and pressure instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment pressure condition.

REFERENCES

1. UFSAR, Section 6.2.

2. 10 CFR 50, Appendix K.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.5 Containment Air Temperature

BASES

BACKGROUND

The containment structure serves to contain radioactive material that may be released from the reactor core following a Design Basis Accident (DBA). The containment average air temperature 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).

The containment average air temperature limit is derived from the input conditions used in the containment functional analyses and the containment structure external pressure analyses. This LCO ensures that initial conditions assumed in the analysis of containment response to a DBA are not violated during unit operations. The total amount of energy to be removed from containment by the Containment Spray and Cooling systems during post accident conditions is dependent upon the energy released to the containment due to the event, as well as the initial containment temperature and pressure. The higher the initial temperature, the more energy which must be removed, resulting in a higher peak containment pressure and temperature. Exceeding containment design pressure may result in leakage greater than that assumed in the accident analysis. Operation with containment temperature in excess of the LCO limit violates an initial condition assumed in the accident analysis.

APPLICABLE SAFETY ANALYSES

Containment average air temperature is an initial condition used in the DBA analyses that establishes the containment environmental qualification operating envelope for both pressure and temperature. The limit for containment average air temperature ensures that operation is maintained within the assumptions used in the DBA analyses for containment (Ref. 1).

The limiting DBAs considered relative to containment OPERABILITY are the LOCA and SLB. The DBA LOCA and SLB are analyzed using computer codes designed to predict the resultant containment pressure transients. No two DBAs are assumed to occur simultaneously or consecutively. The postulated DBAs are analyzed with regard to containment

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Engineered Safety Feature (ESF) systems, assuming no offsite power and the loss of one emergency diesel generator, which is the worst case single active failure, resulting in one train of the Quench Spray (QS) System and Recirculation Spray System being rendered inoperable.

The limiting DBA for the maximum peak containment air temperature is an SLB. The initial containment average air temperature assumed in the design basis analyses is 120°F. This resulted in a maximum containment air temperature of 357°F. The design temperature is 280°F.

The temperature upper limit is used to establish the environmental qualification operating envelope for containment. The maximum peak containment air temperature was calculated to exceed the containment design temperature for a relatively short period of time during the transient. The basis of the containment design temperature, however, is to ensure the performance of safety related equipment inside containment (Ref. 2). Thermal analyses showed that the time interval during which the containment air temperature exceeded the containment design temperature was short enough that there would be no adverse effect on equipment inside containment assumed to mitigate the consequences of the DBA. Therefore, it is concluded that the calculated transient containment air temperature is acceptable for the DBA SLB.

The temperature upper limit is also used in the depressurization analyses to ensure that the minimum pressure limit is maintained following an inadvertent actuation of the QS System (Ref. 1).

The containment pressure transient is sensitive to the initial air mass in containment and, therefore, to the initial containment air temperature. The limiting DBA for establishing the maximum peak containment internal pressure is an SLB. The temperature upper limit is used in the SLB analysis to ensure that, in the event of an accident, the maximum containment internal pressure will not be exceeded.

Containment average air temperature satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

During an SLB, with an initial containment average temperature less than or equal to the LCO temperature limits, the resultant peak accident temperature exceeds containment design temperature for a relatively short period of time, but otherwise is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured.

APPLICABILITY

In MODES 1, 2, 3, and 4, an SLB could cause an accidental release of radioactive material to the environment or a reactivity excursion. 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, maintaining containment average air temperature within the limit is not required in MODE 5 or 6.

ACTIONS

A.1

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

B.1 and B.2

If the containment average air temperature cannot be restored to within its limits within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying that containment average air temperature is within the LCO limits ensures that containment operation remains within the limits assumed for the containment analyses. In order to determine the containment average air temperature,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1 (continued)

a weighted average is calculated using measurements taken at locations within containment selected to provide a representative sample of the overall containment atmosphere. The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment temperature condition.

REFERENCES

1. UFSAR, Section 6.2.

2. 10 CFR 50.49.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.6 Quench Spray (QS) System

BASES

BACKGROUND

The QS System is designed to provide containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. The QS System, operating in conjunction with the Recirculation Spray (RS) System, is designed to cool and depressurize the containment structure to subatmospheric pressure in less than 60 minutes following a Design Basis Accident (DBA). Reduction of containment pressure and the iodine removal capability of the spray limit the release of fission product radioactivity from containment to the environment in the event of a DBA.

The QS System consists of two separate trains of equal capacity, each capable of meeting the design bases. Each train includes a spray pump, a dedicated spray header, nozzles, valves, and piping. Each train is powered from a separate Engineered Safety Features (ESF) bus. The refueling water storage tank (RWST) supplies borated water to the QS System.

The QS System is actuated either automatically by a containment High-High pressure signal or manually. The QS System provides a spray of cold borated water into the upper regions of containment to reduce the containment pressure and temperature during a DBA. Each train of the QS System provides adequate spray coverage to meet the system design requirements for containment heat and iodine fission product removal. The QS System also provides flow to the Inside RS pumps to improve the net positive suction head available.

The Chemical Addition System supplies a sodium hydroxide (NaOH) solution into the spray. The resulting alkaline pH of the spray enhances the ability of the spray to scavenge iodine fission products from the containment atmosphere. The NaOH added to the spray also ensures an alkaline pH for the solution recirculated in the containment sump. The 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.

(continued)

BASES

BACKGROUND (continued)

The QS System is a containment ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. Operation of the QS System and RS System provides the required heat removal capability to limit post accident conditions to less than the containment design values and depressurize the containment structure to subatmospheric pressure in < 60 minutes following a DBA.

The QS System limits the temperature and pressure that could be expected following a DBA and ensures that containment leakage is maintained consistent with the accident analysis.

APPLICABLE SAFETY ANALYSES

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. No DBAs are assumed to occur simultaneously or consecutively. The postulated DBAs are analyzed, with respect to containment ESF Systems, assuming no offsite power and the loss of one emergency diesel generator, which is the worst case single active failure, resulting in one train of the QS System and the RS System inoperable.

During normal operation, the containment internal pressure is varied, along with other parameters, to maintain the capability to depressurize the containment to a subatmospheric pressure in < 60 minutes after a DBA. This capability and the variation of containment pressure during a DBA are functions of the service water temperature, the RWST water temperature, and the containment air temperature.

The DBA analyses (Ref. 1) show that the maximum peak containment pressure of 44.9 psig results from the SLB analysis and is calculated to be less than the containment design pressure. The maximum peak containment atmosphere temperature of 357°F results from the SLB analysis and was calculated to exceed the containment design temperature for a relatively short period of time during the transient. The basis of the containment design temperature, however, is to ensure OPERABILITY of safety related equipment inside containment (Ref. 2). Thermal analyses show that the time interval during which the containment atmosphere temperature exceeded the containment design temperature was short enough that there would be no adverse effect on equipment inside containment assumed to mitigate the consequences of the DBA.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Therefore, it is concluded that the calculated transient containment atmosphere temperatures are acceptable for t e SLB.

The modeled QS System actuation from the containment analysis is based upon a response time associated with exceeding the containment High-High pressure signal setpoint to achieving full flow through the spray nozzles. A delayed response time initiation provides conservative analyses of peak calculated containment temperature and pressure responses. The QS System total response time of 71.1 seconds comprises the signal delay, diesel generator startup time, and system startup time, including pipe fill time.

For certain aspects of 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. For these calculations, the containment 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. 3).

Inadvertent actuation of the QS System is evaluated in the analysis, and the resultant reduction in containment pressure is calculated. The maximum calculated reduction in containment pressure results in containment pressures within the design containment minimum pressure.

The QS System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

During a DBA, one train of the QS System is required to provide the heat removal capability assumed in the safety analyses for containment. In addition, one QS System train, with spray pH adjusted by the contents of the chemical addition tank, is required to scavenge iodine fission products from the containment atmosphere and ensure their retention in the containment sump water. To ensure that these requirements are met, two QS System trains must be OPERABLE with power from two safety related, independent power supplies. Therefore, in the event of an accident, at least one train of QS will operate, assuming that the worst case single active failure occurs.

(continued)

BASES

LCO (continued)

Each QS train includes a spray pump, a dedicated spray header, nozzles, valves, piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment and an increase in containment pressure and temperature requiring the operation of the QS System.

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 QS System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If one QS train is inoperable, it must be restored to OPERABLE status within 72 hours. The components available in this degraded condition are capable of providing 100% of the heat removal and iodine removal needs after an accident. The 72 hour Completion Time was developed taking into account the redundant heat removal and iodine removal capabilities afforded by the OPERABLE train and the low probability of a DBA occurring during this period.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the QS System provides assurance that the proper flow path exists for QS System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.1 (continued)

since they were verified to be in the correct position prior to being secured. 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.

SR 3.6.6.2

Verifying that each QS pump's developed head at the flow test point is greater than or equal to the required developed head ensures that QS pump performance is consistent with the safety analysis assumptions. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the QS System 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 incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.6.3 and SR 3.6.6.4

These SRs ensure that each QS automatic valve actuates to its correct position and each QS pump starts upon receipt of an actual or simulated Containment Pressure high-high signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a unit 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 an 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.5

With the quench 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 that spray coverage of the containment during an accident is not degraded. Due to the passive nature of the design of the nozzle and the non-corrosive design of the system, a test at 10 year intervals is considered adequate to detect obstruction of the nozzles.

REFERENCES

1. UFSAR, Section 6.2.

2. 10 CFR 50.49.

3. 10 CFR 50, Appendix K.

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.7 Recirculation Spray (RS) System

BASES

BACKGROUND

The RS System, operating in conjunction with the Quench Spray (QS) System, is designed to limit the post accident pressure and temperature in the containment to less than the design values and to depressurize the containment structure to a subatmospheric pressure in less than 60 minutes following a Design Basis Accident (DBA). The reduction of containment pressure and the removal of iodine from the containment atmosphere by the spray limit the release of fission product radioactivity from containment to the environment in the event of a DBA.

The RS System consists of two separate trains of equal capacity, each capable of meeting the design and accident analysis bases. Each train includes one RS subsystem outside containment and one RS subsystem inside containment. Each subsystem consists of one approximately 50% capacity spray pump, one spray cooler, one 180° coverage spray header, nozzles, valves, piping, instrumentation, and controls. Each outside RS subsystem also includes a casing cooling pump with its own valves, piping, instrumentation, and controls. The two outside RS subsystems' spray pumps are located outside containment and the two inside RS subsystems' spray pumps are located inside containment. Each RS train (one inside and one outside RS subsystem) is powered from a separate Engineered Safety Features (ESF) bus. Each train of the RS System provides adequate spray coverage to meet the system design requirements for containment heat and iodine fission product removal. Two spray pumps are required to provide 360° of containment spray coverage assumed in the accident analysis. One train of RS or two outside RS subsystems will provide the containment spray coverage and required flow.

The two casing cooling pumps and common casing cooling tank are designed to increase the net positive suction head (NPSH) available to the outside RS pumps by injecting cold water into the suction of the spray pumps. They are also beneficial to the containment depressurization analysis. The casing cooling tank contains at least 116,500 gal of chilled and borated water. Each casing cooling pump supplies one outside spray pump with cold borated water from the casing

(continued)

BASES

BACKGROUND (continued)

cooling tank. The casing cooling pumps are considered part of the outside RS subsystems. Each casing cooling pump is powered from a separate ESF bus.

The RS System provides a spray of subcooled water into the upper regions of containment to reduce the containment pressure and temperature during a DBA. Upon receipt of a High-High containment pressure signal, the two casing cooling pumps start, the casing cooling discharge valves open, and the RS pump suction and discharge valves receive an open signal to assure the valves are open. After a 195±9.75 second time delay, the inside RS pumps start, and after a 210±21 second time delay, the outside RS pumps start. The RS pumps take suction from the containment sump and discharge through their respective spray coolers to the spray headers and into the containment atmosphere. Heat is transferred from the containment sump water to service water in the spray coolers.

The Chemical Addition System supplies a sodium hydroxide (NaOH) solution to the RWST water supplied to the suction of the QS System pumps. The NaOH added to the QS System spray ensures an alkaline pH for the solution recirculated in the containment sump. The resulting alkaline pH of the RS spray (pumped from the sump) enhances the ability of the spray to scavenge iodine fission products from the containment atmosphere. The 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 RS System is a containment ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. Operation of the QS and RS systems provides the required heat removal capability to limit post accident conditions to less than the containment design values and depressurize the containment structure to subatmospheric pressure in < 60 minutes following a DBA.

The RS System limits the temperature and pressure that could be expected following a DBA and ensures that containment leakage is maintained consistent with the accident analysis.

BASES

APPLICABLE SAFETY ANALYSES

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; DBAs are assumed not to occur simultaneously or consecutively. The postulated DBAs are analyzed assuming no offsite power and the loss of one emergency diesel generator, which is the worst case single active failure for containment depressurization, resulting in one train of the QS and RS systems being rendered inoperable (Ref. 1).

The peak containment pressure following a high energy line break is affected by the initial total pressure and temperature of the containment atmosphere and the QS System operation. Maximizing the initial containment total pressure and average atmospheric temperature maximizes the calculated peak pressure. The heat removal effectiveness of the QS System spray is dependent on the temperature of the water in the refueling water storage tank (RWST). The time required to depressurize the containment and the capability to maintain it depressurized below atmospheric pressure depend on the functional performance of the QS and RS systems and the service water temperature. When the Service Water temperature is elevated, it is more difficult to depressurize the containment within 60 minutes since the heat removal effectiveness of the RS System is limited.

During normal operation, the containment internal pressure is varied to maintain the capability to depressurize the containment to a subatmospheric pressure in less than 60 minutes after a DBA. This capability and the variation of containment pressure are functions of service water temperature, RWST water temperature, and the containment air temperature.

The DBA analyses show that the maximum peak containment pressure of 44.9 psig results from the SLB analysis and is calculated to be less than the containment design pressure. The maximum 357.4°F peak containment atmosphere temperature results from the SLB analysis and is calculated to exceed the containment design temperature for a relatively short period of time during the transient. The basis of the containment design temperature, however, is to ensure OPERABILITY of safety related equipment inside containment (Ref. 2). Thermal analyses show that the time interval during which

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

the containment atmosphere temperature exceeds the containment design temperature is short enough that there would be no adverse effect on equipment inside containment. Therefore, it is concluded that the calculated transient containment atmosphere temperatures are acceptable for the SLB and LOCA.

The RS System actuation model from the containment analysis is based upon a response time associated with exceeding the High-High containment pressure signal setpoint to achieving full flow through the RS System spray nozzles. A delay in response time initiation provides conservative analyses of peak calculated containment temperature and pressure. The RS System's total response time is determined by the delay timers and system startup time.

For certain aspects of 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. For these calculations, the containment 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. 3).

The RS System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

During a DBA, one train (one inside and one outside RS subsystem in the same train) or two outside RS subsystems of the RS System are required to provide the minimum heat removal capability assumed in the safety analysis. To ensure that this requirement is met, four RS subsystems and the casing cooling tank must be OPERABLE. This will ensure that at least one train will operate assuming the worst case single failure occurs, which is no offsite power and the loss of one emergency diesel generator.

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the RS System.

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 RS System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

With one of the RS subsystems inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. The components in this degraded condition are capable of providing at least 100% of the heat removal needs (i.e., approximately 150% when one RS subsystem is inoperable) after an accident. The 7 day Completion Time was developed taking into account the redundant heat removal capabilities afforded by combinations of the RS and QS systems and the low probability of a DBA occurring during this period.

B.1 and C.1

With two of the required RS subsystems inoperable either in the same train, or both inside RS subsystems, at least one of the inoperable RS subsystems must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal needs and 360° containment spray coverage after an accident. The 72 hour Completion Time was developed taking into account the redundant heat removal capability afforded by the OPERABLE subsystems, a reasonable amount of time for repairs, and the low probability of a DBA occurring during this period.

D.1

With the casing cooling tank inoperable, the NPSH available to both outside RS subsystem pumps may not be sufficient. The inoperable casing cooling tank must be restored to OPERABLE status within 72 hours. The casing cooling tank does not affect the OPERABILITY of the inside RS subsystems pumps. The effect of the NPSH on outside RS pumps is evaluated as part of outside RS pump OPERABILITY.

BASES

ACTIONS (continued)

E.1 and E.2

If the inoperable RS subsystem(s) or the casing cooling tank cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 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 unit systems. The extended interval to reach MODE 5 allows additional time and is reasonable considering that the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

F.1

With an inoperable inside RS subsystem in one train, and an inoperable outside RS subsystem in the other train, only 180° containment spray coverage is available. This condition is outside accident analysis. With three or more RS subsystems inoperable, the unit is in a condition outside the accident analysis. With two inoperable outside RS subsystems, less than 100% of required RS flow is available. Therefore, in all three cases, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

Verifying that the casing cooling tank solution temperature is within the specified tolerances provides assurance that the water injected into the suction of the outside RS pumps will increase the NPSH available as per design. The 24 hour Frequency of this SR was developed considering operating experience related to the parameter variations and instrument drift during the applicable MODES. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.2

Verifying the casing cooling tank contained borated water volume provides assurance that sufficient water is available to support the outside RS subsystem pumps during the time they are required to operate. The 7 day Frequency of this SR was developed considering operating experience related to

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.7.2 (continued)

the parameter variations and instrument drift during the applicable MODES. Furthermore, the 7 day Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.7.3

Verifying the boron concentration of the solution in the casing cooling tank provides assurance that borated water added from the casing cooling tank to RS subsystems will not dilute the solution being recirculated in the containment sump. The 7 day Frequency of this SR was developed considering the known stability of stored borated water and the low probability of any source of diluting pure water.

SR 3.6.7.4

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the RS System and casing cooling tank provides assurance that the proper flow path exists for operation of the RS System. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified as being in the correct position prior to being secured. 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.

SR 3.6.7.5

Verifying that each RS and casing cooling pump's developed head at the flow test point is greater than or equal to the required developed head ensures that these pumps' performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the RS System 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 incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.6

These SRs ensure that each automatic valve actuates and that the RS System and casing cooling pumps start upon receipt of an actual or simulated High-High containment pressure signal. Start delay times are also verified for the RS System pumps. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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 considered to be acceptable from a reliability standpoint.

SR 3.6.7.7

This SR ensures that each spray nozzle is unobstructed and that spray coverage of the containment will meet its design bases objective. An air or smoke test is performed through each spray header. Due to the passive design of the spray header and its normally dry state, a test at 10 year intervals is considered adequate for detecting obstruction of the nozzles.

REFERENCES

1. UFSAR, Section 6.2.

2. 10 CFR 50.49.

3. 10 CFR 50, Appendix K.

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 Chemical Addition System

BASES

BACKGROUND

The Chemical Addition System is a subsystem of the Quench 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. The NaOH added to the spray also ensures a pH value of between 7.0 and 9.5 of the solution recirculated from the containment sump. This pH band minimizes the evolution of iodine as well as the occurrence of chloride and caustic stress corrosion on mechanical systems and components.

The Chemical Addition System consists of one chemical addition tank, two parallel redundant motor operated valves in the line between the chemical addition tank and the refueling water storage tank (RWST), instrumentation, and a recirculation pump. The NaOH solution is added to the spray water by a balanced gravity feed from the chemical addition 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 $\geq$ 8.5 and $\leq$ 10.5.

The Quench Spray System actuation signal opens the valves from the chemical addition tank to the spray pump suctions or the quench spray pump start signal opens the valves from the chemical addition tank after a 5 minute delay. The 12% to 13% NaOH solution is drawn into the spray pump suctions. The chemical addition 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

(continued)

BASES

BACKGROUND (continued)

sprayed into containment ensures a long term containment sump pH of ≥ 7.0 and ≤ 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 Chemical Addition 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 analysis value volume following the accident. The plant accident dose calculations use an effective containment coverage of 70% of the containment volume. The containment safety analyses implicitly assume that the containment atmosphere is so turbulent following an accidental release of high energy fluids inside containment that, for heat removal purposes, the containment volume is effectively completely covered by spray.

The DBA response time assumed for the Chemical Addition System is based on the Chemical Addition System isolation valves beginning to open 5 minutes after a QS pump start.

The DBA analyses assume that one train of the Quench Spray System is inoperable and that the entire chemical addition tank volume is added through the remaining Quench Spray System flow path.

The Chemical Addition System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The Chemical Addition 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 chemical addition solution must be sufficient to provide NaOH injection into the spray flow until the Quench Spray System has completed pumping water 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. 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.

(continued)

BASES

LCO (continued)

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

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment requiring the operation of the Chemical Addition System. The Chemical Addition 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 Chemical Addition System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If the Chemical Addition System is inoperable, it must be restored to OPERABLE within 72 hours. The pH adjustment of the Quench Spray System flow for iodine removal enhancement is reduced in this condition. The Quench Spray System would still be available and would remove some iodine from the containment atmosphere in the event of a DBA. The 72 hour Completion Time takes into account the ability of the Quench Spray System to remove iodine at a reduced capability using the redundant Quench Spray flow path capabilities and the low probability of the worst case DBA occurring during this period.

B.1 and B.2

If the Chemical Addition System cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 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 unit systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Chemical Addition System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.8.1

Verifying the correct alignment of Chemical Addition System manual, power operated, and automatic valves in the chemical addition flow path provides assurance that the system is able to provide additive to the Quench Spray System in the event of a DBA. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. 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.

SR 3.6.8.2

To provide effective iodine removal, the containment spray must be an alkaline solution. Since the RWST contents are normally acidic, the volume of the chemical addition 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 Chemical Addition 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 3.6.8.3

This SR provides verification, by chemical analysis, of the NaOH concentration in the chemical addition 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 chemical addition tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.4

This SR provides verification that each automatic valve in the Chemical Addition 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 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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.

SR 3.6.8.5

To ensure that the correct pH level is established in the borated water solution provided by the Quench Spray System, flow from the Chemical Addition System is verified once every 5 years by draining solution from the RWST and chemical addition tank through the drain lines in the cross-connection between the tanks. This SR provides assurance that the correct amount of NaOH will be metered into the flow path upon Quench Spray System initiation. Due to the passive nature of the chemical addition flow controls, the 5 year Frequency is sufficient to identify component degradation that may affect flow rate.

REFERENCES None

Intentionally Blank

B 3.6 CONTAINMENT SYSTEMS

B 3.6.9 Hydrogen Recombiners

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 UFSAR, Chapter 3, "Containment Atmosphere Cleanup" (Ref. 2), hydrogen recombiners are required to reduce the hydrogen concentration in the containment following a loss of coolant accident (LOCA). The recombiners accomplish this by recombining hydrogen and oxygen to form water vapor. The vapor is returned to 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).

Two 100% capacity independent hydrogen recombiner systems are provided. The two systems are shared with the opposite unit. Each system consists of controls located in the recombiner vault, a power supply and a recombiner. Recombination is accomplished by heating a hydrogen air mixture to greater than or equal to 1100°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 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 Emergency Diesel Generator bus, is capable of being powered from any Emergency Diesel Generator bus, and is provided with a separate power panel and control panel.

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 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

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

limiting DBA relative to hydrogen generation is a LOCA. 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 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 containment would reach 3.5 v/o about 5 days after the LOCA and 4.0 v/o about 1 day later if no recombiner was functioning. Initiating the hydrogen recombiners within 24 hours after a LOCA 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, placed into service within 24 hours of the LOCA, is capable of limiting the peak hydrogen concentration in containment to less than 4.0 v/o (Ref. 4). The containment atmosphere cleanup system containment purge blowers are similarly designed such that one of two redundant trains is an adequate backup to the redundant hydrogen recombiners.

The hydrogen recombiners satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

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.

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 4.0 v/o following a LOCA, assuming a worst case single failure.

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.

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

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.

(continued)

BASES

ACTIONS

A.1 (continued)

This allowance is based on the availability of the other hydrogen recombiner, the small probability of a LOCA occurring (that would generate an amount of hydrogen that exceeds the flammability limit), and the amount of time available after a LOCA (should one occur) for operator action to prevent hydrogen accumulation from exceeding the flammability limit.

B.1 and B.2

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 atmosphere cleanup system containment purge blowers. The 1 hour Completion Time allows a reasonable period of time to verify that a loss of hydrogen control function does not exist. 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 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.

C.1

If the inoperable hydrogen recombiner(s) cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours. 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 unit systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.9.1

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, and is maintained for at least 2 hours, and that each hydrogen recombiner purge blower operates for at least 15 minutes. Then, using containment atmosphere air at a flow rate of ≥ 50 scfm, the SR verifies that the heater temperature increases to ≥ 1100°F within 5 hours and is maintained for at least 4 hours.

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.

SR 3.6.9.2

This SR ensures there are no physical problems that could affect recombiner operation. Credible failures include fan failure, 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 (i.e. loose wiring or structural connections, deposits of foreign materials, etc.). The 18 month Frequency for this SR was developed considering the incidence of hydrogen recombiners failing the SR in the past is low.

SR 3.6.9.3

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 after performance of SR 3.6.9.1.

The 18 month Frequency for this Surveillance was developed considering the incidence of hydrogen recombiners failing the SR in the past is low.

BASES

REFERENCES

1. 10 CFR 50.44.
2. UFSAR, Section 3.1.37.
3. Regulatory Guide 1.7, dated March 10, 1971.
4. UFSAR, Section 6.2.5.

SECTION 3.6 - CONTAINMENT SYSTEMS

IMPROVED STANDARD TECHNICAL SPECIFICATIONS

MARKUP AND JUSTIFICATION FOR DEVIATIONS

CTS

3.6 CONTAINMENT SYSTEMS

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

3.6.1.1
3.6.1.2
3.6.1.6

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
3.6.1.1 Action 3.6.1.6 Action	A. Containment inoperable.	A.1	Restore containment to OPERABLE status.	1 hour
3.6.1.1 Action 3.6.1.6 Action	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

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CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.6.1.6.1	SR 3.6.1.1	Perform required visual examinations and leakage rate testing except for containment air lock testing, in accordance with 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 ---------- In accordance with 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

the Containment Leakage Rate Testing Program

TSTF-52

the Containment Leakage Rate Testing Program

2

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1. The headings for ISTS 3.6.1 include the parenthetical expression (Atmospheric, Subatmospheric, Ice Condenser, and Dual). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. This bracketed requirement regarding Containment Tendon Surveillance Program is deleted because it is not applicable to North Anna. The North Anna containment does not utilize containment tendons. The following requirements are renumbered, where applicable, to reflect this deletion.

 (1)

3.6 CONTAINMENT SYSTEMS

3.6.2 Containment Air Locks (Atmospheric, Subatmospheric, Ice Condenser, and Dual) (1)

LCO 3.6.2 (1)Two(1) containment air lock(s(1)) shall be OPERABLE. (2)

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

ACTIONS

CTS 3.6.1.3 Note

NEW

NEW

----------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.

CTS 3.6.1.3.a

NEW

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]. (2) ----------	(continued)

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ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
CTS 3.6.1.3.a.1	A. (continued)	A.1	Verify the OPERABLE door is closed in the affected air lock.	1 hour
		AND		
CTS 3.6.1.3.a.1		A.2	Lock the OPERABLE door closed in the affected air lock.	24 hours
		AND		
CTS 3.6.1.3.a.2 NEW		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)

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CTS

NEW

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
	AND	
	B.2 Lock an OPERABLE door closed in the affected air lock.	24 hours
	AND	
	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 lock.	Once per 31 days

(continued)

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CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
CTS 3.6.1.3.b NEW	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	
CTS 3.6.1.3.b		C.2 Verify a door is closed in the affected air lock.	1 hour
		AND	
CTS 3.6.1.3.b		C.3 Restore air lock to OPERABLE status.	24 hours
CTS 3.6.1.3.a.3 CTS 3.6.1.3.b	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

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(1)

CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
NEW	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 of applicable to SR 3.6.1.1 in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions. ----------		TSTF-52
the Containment Leakage Rate Testing Program 4.6.1.3.a	Perform required air lock leakage rate testing in accordance with 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 ≤ [0.05 L_a] when tested at ≥ P_a. b. For each door, leakage rate is ≤ [.01 L_a] when tested at ≥ [psig].	----NOTE---- SR 3.0.2 is not applicable ---------- In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions	TSTF-52 TSTF-52 TSTF-52
4.6.1.3.b	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 the air lock can be opened at a time.	24 months 184 days	(2) TSTF-17

Rev.0

1. The headings for ISTS 3.6.2 include the parenthetical expression (Atmospheric, Subatmospheric, Ice Condenser, and Dual). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. The brackets are removed and the proper plant specific information/value is provided.

CTS

3.6 CONTAINMENT SYSTEMS

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

3.6.3.1 LCO 3.6.3 Each containment isolation valve shall be OPERABLE.

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

18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction

ACTIONS

3.8.A.2 footnote "*"

.....NOTES.....

1. Penetration flow path(s) [except for [42] inch purge valve flow paths] may be unisolated intermittently under administrative controls.

ACTION

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

New

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

New

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.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Action b Action c A. .....NOTE..... Only applicable to penetration flow paths with two containment isolation 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 automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. AND	4 hours (continued)

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CTS

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
NEW	A. (continued) 2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means.	A.2 ---------NOTE--------- (5) 1. 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
NEW	B. ---------NOTE--------- Only applicable to penetration flow paths with two containment isolation 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 automatic valve, closed manual valve, or blind flange.	1 hour

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(continued)

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CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action b Action c	C. ---------NOTE--------- Only applicable to penetration flow paths with only one containment isolation valve and a closed system. ---------- 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 automatic valve, closed manual valve, or blind flange.	~~4~~ 72 hours TSTF-30 2
		AND	
NEW	2. Isolation devices that are locked, sealed, or otherwise secured may be verified by use of administrative means.	C.2 1. --------NOTE--------- 5 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 TSTF-269
	~~D. Shield building bypass leakage not within limit.~~	~~D.1 Restore leakage within limit.~~	~~4 hours~~ 3
	~~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~~ 3

(continued)

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CTS

ACTIONS

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
Required Action and associated Completion Time not met.	F.1	Be in MODE 3.	6 hours
	AND F.2	Be in MODE 5.	36 hours

Action d

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CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1	Verify each [42] inch purge valve is sealed closed, except for one purge valve in a penetration flow path while in Condition E of this LCO.	31 days
SR 3.6.3.2	Verify each [8] inch purge valve is 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.	31 days
NEW 4.6.1.1.a SR 3.6.3.3	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative controls. ---------- Verify each containment isolation manual valve and blind flange that is located outside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	31 days TSTF-45

and not locked, sealed, or otherwise secured

(continued)

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CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
NEW 4.6.1.1.a "*" SR 3.6.3.~~4~~	----------NOTE---------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. ---------- Verify each containment isolation manual valve and blind flange that is located inside containment and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls. (and not locked, sealed, or otherwise secured)	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days TSTF-45
4.6.3.1.3 SR 3.6.3.~~5~~	Verify the isolation time of each power operated and each automatic containment isolation valve is within limits. (power operated)	In accordance with the Inservice Testing Program or ~~92 days~~ TSTF-46
4.6.3.1.1 ~~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 < 15.0 psid.~~	~~92 days~~

(continued)

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CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.7	Perform leakage rate testing for containment purge valves with resilient seals.	184 days AND Within 92 days after opening the valve
4.6.3.1.2.a,b+c SR 3.6.3.8	Verify each automatic power operated 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.	[18] months
4.6.3.1.2.d 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
SR 3.6.3.10	Verify each [ ] inch containment purge valve is blocked to restrict the valve from opening > [50]%.	[18] months

(continued)

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CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.11	Verify the combined leakage rate for all shield building bypass leakage paths is ≤ [L_a] when pressurized to ≥ [psig].	~~-----NOTE----- SR 3.0.2 is not applicable ----------~~ TSTF-52 3 ~~In accordance with 10 CFR 50, Appendix J, as modified by approved exemptions~~ TSTF-52 ~~the Containment Leakage Rate Testing Program~~

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1. The headings for ISTS 3.6.3 include the parenthetical expression (Atmospheric, Subatmospheric, Ice Condenser, and Dual). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. The brackets are removed and the proper plant specific information/value is provided.

3. Conditions, Surveillance Requirements and other references to purge valves and shield building bypass are not retained. Shield building bypass is not part of the NAPS design. Purge valves are not opened in MODES 1, 2, 3 and 4. The CTS treat the purge valves in the same manner as other containment isolation valves. As stated in the SR 3.6.3.1 and 3.6.3.2 Bases, the separate criteria applied to purge valves in the ISTS are related to use of the valves during unit operations. Subsequent requirements are numbered and lettered accordingly.

4. Only power operated containment isolation valves are considered automatic at NAPS, so the reference to them is clarified in SR 3.6.3.5.

5. ITS SR 3.6.3.6 requires each weight or spring loaded check valve used as a containment isolation valve that can be tested during operation to be tested through one complete cycle of travel every 92 days. North Anna CTS Surveillance 4.6.3.1.1 contains a similar requirement. ITS SR 3.6.3.6 is deleted as North Anna does not contain weight or spring loaded check valves used as containment isolation valves that are testable during operation. Therefore, this Surveillance does not apply.

6. ISTS 3.6.3 ACTIONS NOTE 4 is modified to clarify that entry is required into the applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when leakage for a penetration flow path, instead of when isolation valve leakage, results in exceeding the overall containment leakage rate acceptance criteria. The Containment is not inoperable if there is still an OPERABLE containment isolation valve in the affected flow path. This change is acceptable because ISTS 3.6.3 Required Action A.1 allows 4 hours to isolate the affected penetration flow with one or more penetration flow paths with one containment isolation valve inoperable. If Required Action A.1 and its associated Completion Time is not met, the unit is required to be placed in MODE 3 within 6 hours, and MODE 5 within 36 hours. This is consistent with ISTS 3.6.1 which requires an inoperable Containment be restored to OPERABLE status within 1 hour, or the unit is required to be placed in MODE 3 within 6 hours, and MODE 5 within 36 hours. This is also consistent with the current licensing basis.

CTS

3.6 CONTAINMENT SYSTEMS

3.6.4B Containment Pressure (Subatmospheric)

3.6.1.4 LCO 3.6.4B Containment air partial pressure shall be ≥ [9.0] psia and within the acceptable operation range shown on Figure 3.6.4B-1.

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action	A. Containment air partial pressure not within limits.	A.1 Restore containment air partial pressure to within limits.	1 hour
Action	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
4.6.1.4	SR 3.6.4B.1 Verify containment air partial pressure is within limits.	12 hours

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CTS

Figure 3.6-1

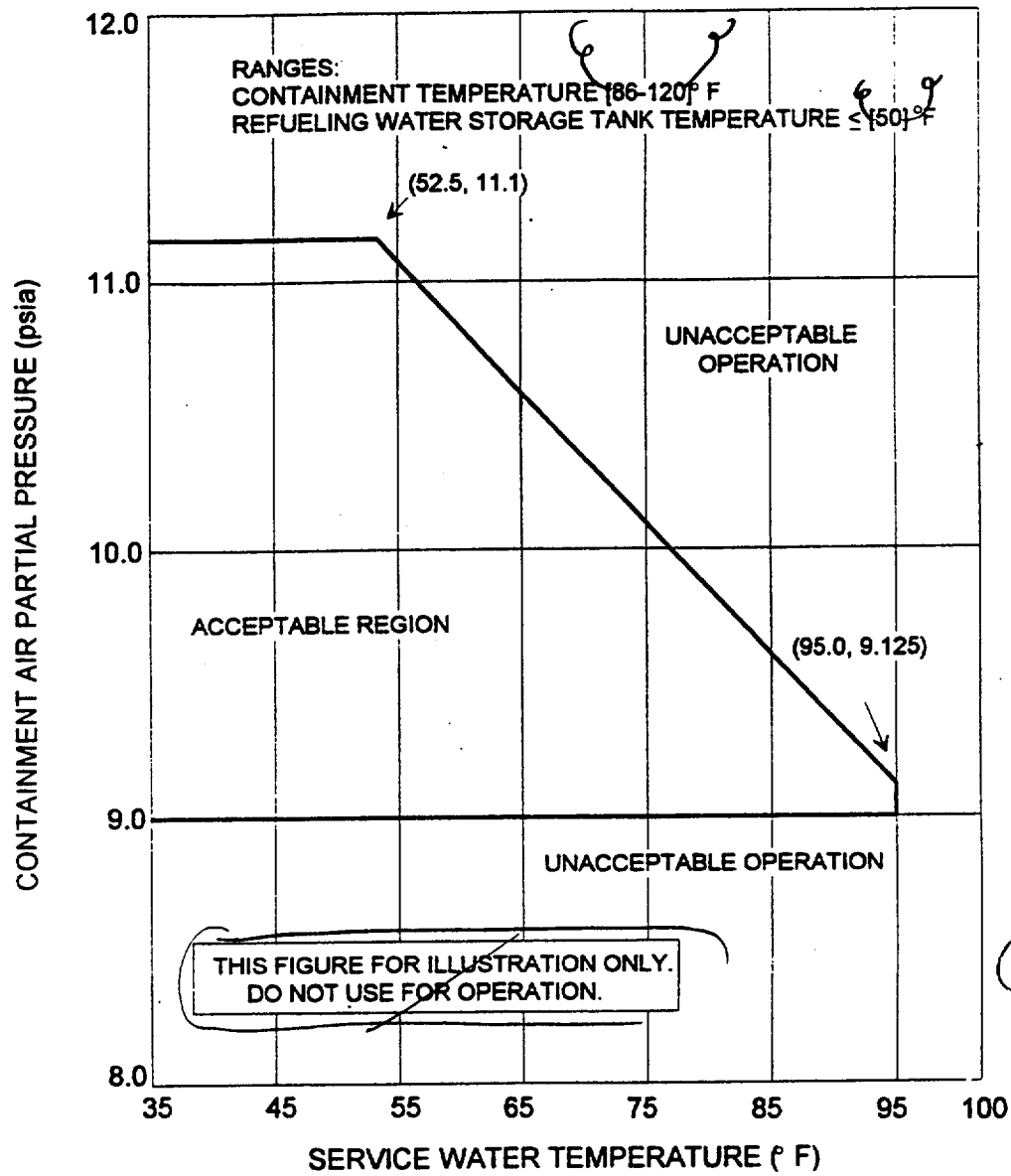

Figure 3.6.4B-1 (page 1 of 1)
Containment Air Partial Pressure Versus
Service Water Temperature

Rev.0

1. The headings for ISTS 3.6.4 include the parenthetical expression (Subatmospheric). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. The brackets are removed and the proper plant specific information/value is provided.

3. Plant specific containment air partial pressure versus Service Water temperature graph is inserted.

3.6 CONTAINMENT SYSTEMS

CTS

3.6.5C Containment Air Temperature (Subatmospheric)

3.6.1.5

LCO 3.6.5C Containment average air temperature shall be ≥ [86]°F and ≤ [120]°F.

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

ACTIONS

Action

Action

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment average air temperature not within limits.	A.1 Restore containment average air temperature to within limits.	8 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

4.6.1.5.1

SURVEILLANCE	FREQUENCY
SR 3.6.5C.1 Verify containment average air temperature is within limits.	24 hours

Rev. 0

1. The headings for ISTS 3.6.5 include the parenthetical expression (Subatmospheric). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. The brackets are removed and the proper plant specific information/value is provided.

CTS

3.6 CONTAINMENT SYSTEMS

3.6.6 Quench Spray (QS) System ~~(Subatmospheric)~~ (1)

LCO 3.6.2.1 LCO 3.6.6 Two QS trains shall be OPERABLE. (1)

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
Action	A. One QS train inoperable.	A.1 Restore QS train to OPERABLE status.	72 hours
Action	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
4.6.2.1.a.1	SR 3.6.6.1	Verify each QS 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 (1)

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
4.6.2.1.b	SR 3.6.6~~0~~.2	Verify each QS 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	(1)
4.6.2.1.c.1	SR 3.6.6~~0~~.3	Verify each QS 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.	~~12~~18 months	(1) (2)
4.6.2.1.c.2	SR 3.6.6~~0~~.4	Verify each QS pump starts automatically on an actual or simulated actuation signal.	~~12~~18 months	(1) (2)
4.6.2.1.d	SR 3.6.6~~0~~.5	Verify each spray nozzle is unobstructed.	~~At first refueling AND~~ 10 years	(1) (3)

Rev.0

1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages were made.

2. The brackets are removed and the proper plant specific information/value is provided.

3. North Anna Units 1 and 2 have completed the first refueling outages. Therefore, the SR 3.6.6.5 bracketed Frequency of "At first refueling" is not needed and is removed.

3.6 CONTAINMENT SYSTEMS

CTS

3.6.6E Recirculation Spray (RS) System ~~(Subatmospheric)~~

3.6.2.2

LCO 3.6.6E Four RS subsystems ~~[~~and a casing cooling tank~~]~~ shall be OPERABLE.

Applicability

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

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
Action a	A. One RS subsystem inoperable.	A.1	Restore RS subsystem to OPERABLE status.	7 days
Action b	B. Two RS subsystems inoperable in one train.	B.1	Restore one RS subsystem to OPERABLE status.	72 hours
new	~~[~~C. Two inside RS subsystems inoperable.~~]~~	C.1	Restore one RS subsystem to OPERABLE status.	72 hours ~~]~~
	~~D. Two outside RS subsystems inoperable.~~	~~D.1~~	~~Restore one RS subsystem to OPERABLE status.~~	~~72 hours~~
Action c	~~[~~E. Casing cooling tank inoperable.~~]~~	E.1	Restore casing cooling tank to OPERABLE status.	72 hours ~~]~~

(continued)

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F. One outside RS subsystem and one inside RS subsystem inoperable and not in the same train.
OR

CTS

Action a
Action b
Action c
new

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 84 hours
G. Three or more RS subsystems inoperable.	F.1 Enter LCO 3.0.3.	Immediately

new

OR
Two outside RS subsystems inoperable.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.6.2.2.2.b 3.6.2.2.b.3	SR 3.6.6E.1	Verify casing cooling tank temperature is ≥ 35°F and ≤ 50°F.	24 hours
4.6.2.2.2.a.1 3.6.2.2.b.1	SR 3.6.6E.2	Verify casing cooling tank contained borated water volume is ≥ 116,500 gal.	7 days
4.6.2.2.2.a.2 3.6.2.2.b.2	SR 3.6.6E.3	Verify casing cooling tank boron concentration is ≥ 2300 ppm and ≤ 2400 ppm.	7 days
4.6.2.2.1.a	SR 3.6.6E.4	Verify each RS and casing cooling 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)

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CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.2.2.1.b	SR 3.6.6E.5 (7)	Verify each RS ~~[and casing cooling]~~ 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	(1) (2)
4.6.2.2.1.c.2 4.6.2.2.1.c.1 4.6.2.2.1.c.1	SR 3.6.6E.6 (7)	Verify on an actual or simulated actuation signal(s): a. Each RS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position; b. Each RS pump starts automatically; and ~~[~~c. Each casing cooling pump starts automatically.~~]~~	~~[~~18~~]~~ months	(1) (3) (2)
4.6.2.2.1.d	SR 3.6.6E.7 (7)	Verify each spray nozzle is unobstructed.	~~At first refueling AND~~ 10 years	(1) (4)

Rev.0

1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages were made.

2. The North Anna Recirculation Spray (RS) System consists of 2 trains. Each train consists of an inside RS subsystem and outside RS subsystem. The outside RS subsystems are supported by a casing cooling tank. Each subsystem supplies water to a spray header which covers 180° of the containment, for a total of 4 spray headers. The Required Actions when two subsystems are inoperable must consider both the available heat removal capacity and the available spray coverage. The accident analysis assumes that 360° of spray coverage is available. In order to clarify this aspect of the North Anna design, the combination of two inoperable RS subsystems which does not provide 360° of containment spray coverage is added to the ACTION for inadequate heat removal. The Bases are enhanced to explain the requirements. This deviation reflects the North Anna design and provides ACTIONS for all combinations of inoperable RS subsystems and makes clear which combinations are acceptable and why.

3. The brackets are removed and the proper plant specific information/value is provided.

4. North Anna Units 1 and 2 have completed the first refueling outages. Therefore, the SR 3.6.7.7 bracketed Frequency of "At first refueling" is not needed and is removed.

5. North Anna Units 1 and 2 Outside RS subsystems provide a higher flow capacity than the inside RS subsystems. Allowing two outside RS subsystems to be inoperable would leave less than 100% of the required spray capacity. Therefore, this bracketed allowance is not adopted.

Chemical Addition System

~~Spray Additive System~~ (~~Atmospheric~~, Subat~~mospheric~~, ~~Ice~~ Conden~~ser~~, and ~~Dual~~) 3.6.7 8 1

CTS

3.6 CONTAINMENT SYSTEMS

Chemical Addition System

3.6.7 8 ~~Spray Additive System~~ (~~Atmospheric~~, Subat~~mospheric~~, Ice C~~ondenser~~, ~~and~~ ~~Dual~~) 1

LCO 3.6.2.3 LCO 3.6.7 8 The ~~Spray Additive System~~ shall be OPERABLE. 1

Chemical Addition System

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

Chemical Addition System

	SURVEILLANCE		FREQUENCY
4.6.2.3.a	SR 3.6.7 8.1	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 1

(continued)

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Chemical Addition System

~~Spray Additive System~~ ~~(Atmospheric, Subatmospheric, Ice Condenser, and Dual)~~ 3.6.7 (1) (8)

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.2.3.b.1 chemical addition	SR 3.6.7.2 (8)	Verify ~~spray additive~~ tank solution volume is ≥ [2568] (4800) gal and ≤ [4000] (5500) gal.	184 days	(1) (2)
4.6.2.3.b.2	SR 3.6.7.3 (8)	Verify ~~spray additive~~ tank (2) ~~(NaOH)~~ solution concentration is ≥ [30] (12)% and ≤ [32] (13)% by weight.	184 days	(1) (2)
4.6.2.3.c Chemical Addition System	SR 3.6.7.4 (8)	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.	18 months	(1) (2)
4.6.2.3.d	SR 3.6.7.5 (8)	Verify ~~spray additive~~ flow ~~[rate]~~ from each solution's flow path.	5 years	(1) (2)

Rev. 0

1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages, including renumbering of specifications, were made. North Anna also utilizes a Chemical Addition System which is referred to as a Spray Additive System in NUREG-1431. The Chemical Addition System includes a chemical addition tank instead of a spray additive tank. The names have been corrected in the ITS.

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

CTS

 1

3.6 CONTAINMENT SYSTEMS

3.6.4.2

3.6.8 9 Hydrogen Recombiners (Atmospheric, Subatmospheric, Ice Condenser, and Dual) (if permanently installed) 1

LCO 3.6.8 9 Two hydrogen recombiners shall be OPERABLE. 1

APPLICABILITY: MODES 1 and 2.

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
Action a Action b	A. One hydrogen recombiner inoperable.	A.1	--------NOTE-------- LCO 3.0.4 is not applicable. ---------- Restore hydrogen recombiner to OPERABLE status.	30 days
NEW	B. Two hydrogen recombiners inoperable.	B.1	Verify by administrative means that the hydrogen control function is maintained.	1 hour AND Once per 12 hours thereafter
		AND B.2	Restore one hydrogen recombiner to OPERABLE status.	7 days
Action a	C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours

2

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CTS

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.6.4.2.a 4.6.4.2.b	SR 3.6.~~6~~9.1	Perform a system functional test for each hydrogen recombiner.	1 2 [18] months
4.6.4.2.d	SR 3.6.~~6~~9.2	Visually examine each hydrogen recombiner enclosure and verify there is no evidence of abnormal conditions.	1 2 [18] months
4.6.4.2.c	SR 3.6.~~6~~9.3	Perform a resistance to ground test for each heater phase.	1 2 [18] months

Rev. 0

1. The headings for ISTS 3.6.9 include the parenthetical expression (Atmospheric, Subatmospheric, Ice Condenser, and Dual). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying the appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made.

2. The brackets are removed and the proper plant specific information/value is provided.

SECTION 3.6 - CONTAINMENT SYSTEMS

IMPROVED STANDARD TECHNICAL SPECIFICATIONS BASES

MARKUP AND JUSTIFICATION FOR DEVIATIONS

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment (Subatmospheric)

BASES

BACKGROUND

The containment consists of the concrete reactor building, its steel liner, and the penetrations through this structure. The structure is designed to contain radioactive material that may be released from the reactor core following a Design Basis Accident (DBA). Additionally, this structure provides shielding from the fission products that may be present in the containment atmosphere following accident conditions.

loss of coolant accident (LOCA)

The containment is a reinforced concrete structure with a cylindrical wall, a flat foundation mat, and a shallow dome roof. The inside surface of the containment is lined with a carbon steel liner to ensure a high degree of leak tightness during operating and accident conditions.

For containments with ungrouted tendons, the cylinder wall is prestressed with a post tensioning system in the vertical and horizontal directions, and the dome roof is prestressed utilizing a three way post tensioning system.

The concrete reactor building is required for structural integrity of the containment under DBA conditions. The steel liner 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 (Ref. 1), as modified by approved exemptions.

Design Basis Accident (DBA)

Option B

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

(continued)

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BASES

BACKGROUND (continued)

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"; 2

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.[ ]. 2

APPLICABLE SAFETY ANALYSES

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

The DBAs that result in a challenge to containment OPERABILITY from high pressures and temperatures are a loss of coolant accident (LOCA), 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 containment was designed with an allowable leakage rate of 0.1% of containment air weight per day (Ref. 3). This leakage rate, used to evaluate offsite doses resulting from accidents, is defined in 10 CFR 50, Appendix J, (Ref. 1), as L_a: the maximum allowable containment leakage rate at the calculated peak containment 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 0.1% per day in the safety analyses at P_a = [40.4] psig (Ref. 3). 3

Option B

design basis LOCA

of containment air weight

44.1

6

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

(continued)

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BASES

APPLICABLE SAFETY ANALYSES (continued)

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

LCO

Containment Leakage Rate Testing Program

Containment OPERABILITY is maintained by limiting leakage to ≤ 1.0 L_a, except prior to the first startup after performing a required 10 CFR 50, Appendix J, leakage test. At this time, the combined Type B and C leakage must be < 0.6 L_a, and the overall Type A leakage must be < 0.75 L_a.

the applicable leakage limits must be met.

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) [and purge valves with resilient seals (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 Appendix J (1.0 La).

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 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 during MODES 1, 2, 3, and 4. This time period

(continued)

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BASES

ACTIONS

A.1 (continued)

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. Unit 1

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. Failure to meet air lock [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 to exceed limits. As left leakage prior to the first startup after performing a required 10 CFR 50, Appendix J, leakage test is required to be ≤ 0.6 L_a for combined Type B and C leakage, and ≤ 0.75 L_a for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of ≤ 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 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.

the

Containment Leakage Rate Testing Program

the Containment Leakage Rate Testing Program

TSTF-52 3 3

TSTF-52

TSTF-52

INSERT A

5 TSTF-52

(continued)

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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).

REFERENCES

1. 10 CFR 50, Appendix J, Option B
2. FSAR, Chapter [15].
3. FSAR, Section [6.2].
4. Regulatory Guide 1.35, Revision [1].

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1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

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

4. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

5. Reviewer's note not retained.

6. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

B 3.6 CONTAINMENT SYSTEMS

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

BASES

One of which is 7 ft. in diameter, the other 5.75

BACKGROUND

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

The 5.75 ft diameter equipment hatch escape air lock is an integral part of the containment equipment hatch.

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 Design Basis Accident (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).

INSERT

The 7 ft

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.

alarm

inside or outside

operation

Outside access to the 5.75 ft. equipment hatch escape airlock is controlled by an alarmed door to the space outside containment which provides access to the air lock.

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 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.

(continued)

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INSERT

The inner and outer door of the 7 ft diameter personnel air lock include an 18 inch diameter emergency manway. The manways contain double gasketed seals and local leak rate testing capability to ensure pressure integrity. The manways are to be used only for emergency entrance or exit from the air lock. Operation of the manways of the 7 ft personnel air lock is controlled administratively.

BASES (continued)

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident and a rod ejection accident (Ref. 2). In the 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 containment was designed with an allowable leakage rate of [0.1]% of containment air weight per day (Ref. 2). This leakage rate is defined in 10 CFR 50, Appendix J, Ref. 1), as L_a = [0.1]% of containment air weight per day, the maximum allowable containment leakage rate at the calculated peak containment internal pressure P_a = [14.4] psig (44.1) following a DBA. This allowable leakage rate forms the basis for the acceptance criteria imposed on the SRs associated with the air locks.

Option A (B)

design basis LOCA

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

LCO

Each containment air lock forms the part of the pressure boundary containment pressure boundary. As part of containment, the air lock safety function is related to control 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 Type B air lock leakage test, and both air lock doors must be OPERABLE. The interlock 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 and or exit from containment.

INSERT 1

INSERT 2

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

(continued)

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INSERT 1

Opening or closing of the manways of the 7 ft personnel air lock is treated in the same manner as opening or closing of the associated door.

INSERT 2

Operation of the manways of the 7 ft personnel air lock is controlled administratively. These provisions

BASES

APPLICABILITY (continued)

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.~~3~~ 4, "Containment Penetrations." (1)

ACTIONS

The ACTIONS are modified by 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. It 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 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.

used for

to Containment due to the size and configuration of the 5.75 ft equipment hatch escape air lock. This

7 ft.

(7)

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)

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(2)

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. 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.

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. 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

(continued)

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BASES

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 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.

(continued)

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BASES

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, Required Action C.1 requires action to be initiated immediately to evaluate previous combined leakage rates using current air lock test results. An evaluation 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 limits. 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.

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.

(continued)

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(2)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.2.1

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of 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 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 Appendix J (Ref. 1), as modified by approved exemptions. Thus, SR 3.0.2 (which allows Frequency extensions) does not apply.

the Containment Leakage Rate Testing Program.

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The SR has been modified by two Notes. Note 1 states that an inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is considered reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA. Note 2 has been added to this SR requiring the results to be evaluated against the acceptance criteria of SR 3.6.1.1. This ensures that air lock leakage is properly accounted for in determining the overall containment leakage rate.

which are applicable to

combined Type B and C

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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 only challenged when the containment air lock door is opened, this test is only required to be performed upon entering or exiting a containment air lock but is not required more frequently

(3)

(8)

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when combined with administrative procedures

not normally

Insert

(continued)

Used for entry and exit (procedures require strict adherence to single door opening)

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INSERT

every 24 months. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage, and the potential for loss of containment OPERABILITY if the Surveillance were performed with the reactor at power.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

24 month

also

~~than every 184 days.~~ The 184 day Frequency is based on engineering judgment and is considered adequate in view of other indications of door and interlock mechanism status available to operations personnel.

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REFERENCES

1. 10 CFR 50, Appendix J, Option B
2. FSAR, Section 6.2.1
3. UFSAR, Chapter 15.

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given that the interlock is not challenged during the use of the airlock.

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1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

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

4. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

5. One of the containment air locks is part of the containment wall and the other is an integral part of the containment equipment hatch. Descriptions of the differences between the two air locks are incorporated into the Bases.

6. The discussion regarding pressure seated doors and how an increase in containment internal pressure increasing the sealing force on each door is deleted. This discussion only applies to the inside door, and given the normal subatmospheric containment pressure, the discussion becomes confusing and is unnecessary.

7. The 5.75 ft equipment hatch escape airlock is only for use in emergencies due to its small size and its configuration. The 7 ft personnel airlock is the preferred means of access. The Actions Bases are modified to reflect this design. The Bases for Note 2 regarding Required Actions A.1, A.2 and A.3 are modified to allow entry and exit for 7 days under administrative control for either air lock having an inoperable door to reflect this design.

8. A description is added to the Background stating that the inner and outer door of the 7 ft diameter personnel airlock include an 18 inch diameter emergency manway. The manways contain double gasketed seals and local leak rate testing capability to ensure pressure integrity. Operation of the manways of the 7 ft personnel air lock is controlled administratively. Additional words are provided to the LCO and SR 3.6.2.2 Bases clarifying that the interlocks together with administrative procedures prevent simultaneous opening of the inner and outer doors of the 7 ft personnel airlock.

B 3.6 CONTAINMENT SYSTEMS

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 automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices. Two barriers in series are provided for each penetration 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. These barriers (typically containment isolation valves) make up the Containment Isolation System.

Automatic isolation signals are produced during accident conditions. Containment Phase "A" isolation occurs upon receipt of a safety injection signal. The Phase "A" isolation signal isolates nonessential process lines in order to minimize leakage of fission product radioactivity. Containment Phase "B" isolation occurs upon receipt of a containment pressure High-High signal and isolates the remaining process lines, except systems required for accident mitigation. In addition to the isolation signals listed above, the purge and exhaust valves receive an isolation signal on a containment high radiation condition. As a result, the containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated from the environment in the event of a release of fission product radioactivity to the containment atmosphere as a result of a Design Basis Accident (DBA).

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the

(continued)

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BASES

BACKGROUND (continued)

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.

18 inch containment vacuum breaking valve, and 8 inch purge bypass valve

Shutdown Containment Purge System ([42] 36 inch purge and exhaust valves)

The 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. The supply and exhaust lines each contain two isolation valves. Because of their large size, the [42] inch purge valves in some units are not qualified for automatic closure from their open position under DBA conditions. Therefore, the [42] inch purge valves are normally maintained closed in MODES 1, 2, 3, and 4 to ensure the containment boundary is maintained.

Design Basis Accident

The 18 inch containment vacuum breaking valve and 8 inch purge bypass valve are also maintained closed in MODES 1, 2, 3 and 4.

Minipurge System ([8] inch purge valves)

The Minipurge System operates to:

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

b. Equalize internal and external pressures.

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.

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 containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness of the containment. Therefore, the safety analyses of any event requiring isolation of containment is applicable to this LCO.

(continued)

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident (LOCA) and a rod ejection accident (Ref. 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 [42] inch purge and exhaust valves are closed at event initiation.

The DBA analysis assumes that, within 60 seconds after the accident, isolation of the containment is complete and leakage terminated except for 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 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 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.]~~

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

(continued)

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BASES (continued)

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 automatic power operated isolation valves are required to have isolation times within limits and to actuate on an automatic isolation signal. The [12] inch purge valves must be 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 along with their associated stroke times in the FSAR (Ref. 2).

The normally closed isolation valves are considered OPERABLE when manual valves are closed, automatic 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 1.

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."

(continued)

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18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction

BASES (continued)

ACTIONS

The ACTIONS are modified by a Note allowing penetration flow paths, except for [42] inch purge 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 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 size of the containment purge line penetration and the fact that those penetrations exhaust directly from the containment atmosphere to the environment, the penetration flow path containing these 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.

the 36 inch valves are not qualified for automatic closure from their open position under DBA conditions and that these and the other penetrations listed as excepted

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable 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.

for a containment penetration flow path

In the event the air lock leakage results in exceeding the overall containment leakage rate, Note 4 directs entry into the applicable Conditions and Required Actions of LCO 3.6.1.

acceptance criteria

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

(continued)

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BASES

ACTIONS

A.1 and A.2 (continued)

failure. Isolation barriers that meet this criterion are a closed and de-activated automatic containment isolation valve, a closed manual valve, a blind flange, and a check valve with flow through the valve secured. 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.

For affected penetration flow paths that cannot be restored to OPERABLE status within the 4 hour Completion Time and 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 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 with two containment isolation valves. For penetration flow paths with only one containment isolation valve and a closed system, Condition C provides the appropriate actions.

(continued)

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(2)

BASES

ACTIONS

A.1 and A.2 (continued)

Required Action A.2 is modified by two Notes. 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. Therefore, the probability of misalignment of these devices once they have been verified to be in the proper position, is small.

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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.

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 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.

Condition B is modified by a Note indicating this Condition is only applicable to penetration flow paths with two containment isolation valves. Condition A of this LCO addresses the condition of one containment isolation valve inoperable in this type of penetration flow path.

(continued)

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(2)

BASES

ACTIONS (continued)

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 automatic valve, a closed manual valve, and a blind flange. A check valve may not be used to isolate the affected penetration flow path. Required Action C.1 must be completed within the [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 assure leak tightness of containment and that containment penetrations requiring isolation following an accident are isolated. 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.

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The closed system must meet the requirements of Reference 3.

Condition C is modified by a Note indicating that this Condition is only applicable to those penetration flow paths 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.

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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.

Required Action C.2 is modified by (two) Notes (s) (Note 1) that 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. Therefore, the probability of misalignment of these valves, once they have been verified to be in the proper position, is small.

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(continued)

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BASES

ACTIONS (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 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 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.

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

(continued)

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BASES

ACTIONS

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

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 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). 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.

F.1 and F.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.

Unit

(continued)

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2

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each [42] inch containment purge valve is required to be verified sealed closed at 31 day intervals. This Surveillance is designed to ensure that 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 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.

2

SR 3.6.3.2

This SR ensures that the minipurge valves are closed as required or, if open, open for an allowable reason. 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 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.

(continued)

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(2)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.~~8~~ (1)

(2)

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 isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 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 valves that are open under administrative controls are not required to meet the SR during the time the valves are open. ← Insert

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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 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.

SR 3.6.3.~~9~~ (2)

(2)

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 valves 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

TSTF-45

(continued)

Rev. 0

INSERT

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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.~~4~~ 2 (continued)

administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation valves that are open under administrative controls are not required to meet the SR during the time they are open. ← Insert

TSTF-45

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. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position, is small.

SR 3.6.3.~~5~~ 3

TSTF-46

power operated

Verifying that the isolation time of each power operated and automatic 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.]

~~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.~~

(continued)

Rev. 0

INSERT

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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.7

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).

Additionally, this SR must be performed 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.

Option B

TSTF-52

SR 3.6.3.8

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

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.9

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

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 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 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 3.6.3.11

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

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.11 (continued)

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 Frequency is required by 10 CFR 50, Appendix J, as modified by approved exemptions (and therefore, the 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.

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

Containment Leakage Rate Testing Program.

TSTF-52

REFERENCES

1. FSAR, Section 15.
2. FSAR, Section [6.2]. Technical Requirements Manual.
3. Generic Issue B-20, "Containment Leakage Due to Seal Deterioration."
4. Generic Issue B-24.

3. Standard Review Plan 6.2.4

TSTF-30

Rev.0

1. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

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

4. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

5. Typographical/grammatical error corrected.

6. A statement in the Bases related to use of check valves is deleted. As stated in UFSAR Section 6.2.4.2, check valves may be used to isolate specified penetration flow paths.

7. The Bases are corrected to eliminate a statement classifying check valves as active devices. The statement is inconsistent with the NAPS design basis.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.48 Containment Pressure (Subatmospheric)

BASES

BACKGROUND

Containment air partial pressure is a process variable that is monitored and controlled. The containment air partial pressure is maintained as a function of refueling water storage tank temperature and service water temperature according to Figure 3.6.48-1 of the LCO, to ensure that, following a Design Basis Accident (DBA), the containment would depressurize in < 60 minutes to subatmospheric conditions. Controlling containment partial pressure within prescribed limits also prevents the containment pressure from exceeding the containment design negative pressure differential with respect to the outside atmosphere in the event of an inadvertent actuation of the Quench Spray (QS) System.

The containment internal air partial pressure limits of Figure 3.6.48-1 are derived from the input conditions used in the containment DBA analyses. Limiting the containment internal air partial pressure and temperature in turn limits the pressure that could be expected following a DBA, thus ensuring containment OPERABILITY. Ensuring containment OPERABILITY limits leakage of fission product radioactivity from containment to the environment.

APPLICABLE SAFETY ANALYSES

Containment air partial pressure is an initial condition used in the containment DBA analyses to establish the maximum peak containment internal pressure. The limiting DBAs considered relative to containment pressure are the loss of coolant accident (LOCA) and steam line break (SLB). The LOCA and SLB are analyzed using computer codes designed to predict the resultant containment pressure transients. DBAs are assumed not to occur simultaneously or consecutively. The postulated DBAs are analyzed assuming degraded containment Engineered Safety Feature (ESF) systems (i.e., assuming the loss of one ESF bus, which is the worst case single active failure, resulting in one train of the QS System and one train of the Recirculation Spray System becoming inoperable). The containment analysis for the DBA (Ref. 1) shows that the maximum peak containment pressure, Pa, results from the limiting design basis LOCA.

no offsite power and

emergency diesel generator

SLB

(continued)

Rev. 0

BASES

APPLICABLE SAFETY ANALYSES (continued)

The maximum design internal pressure for the containment is [45.0] psig. The initial conditions used in the containment design basis analyses were an air partial pressure of [12.2] psia and an air temperature of [120]°F. This resulted in a maximum peak containment internal pressure of [44.9] psig, which is less than the maximum design internal pressure for the containment.

The containment was also designed for an external pressure load of [9.2] psid (i.e., a design minimum pressure of [5.5] psia). The inadvertent actuation of the QS System was analyzed to determine the reduction in containment pressure (Ref. 1). The initial conditions used in the analysis were [8.6] psia and [120]°F. This resulted in a minimum pressure inside containment of [7.1] psia, which is considerably above the design minimum of [5.5] psia.

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. For the reflood phase calculations, 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 the NRC Policy Statement.

LCO

Maintaining containment pressure within the limits shown in Figure 3.6.4B-1 of the LCO ensures that in the event of a DBA the resultant peak containment accident pressure will be maintained below the containment design pressure. 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 QS System. The LCO limits also ensure the return to subatmospheric conditions within 60 minutes following a DBA.

(continued)

Rev. 0

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. Since maintaining containment pressure within design basis 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 Reactor Coolant System pressure and temperature 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 air partial pressure is not within the limits of the LCO, containment pressure must be restored to within these limits within 1 hour. The Required Action is necessary to return operation to within the bounds of the containment analysis. The 1 hour Completion Time is consistent with the ACTIONS of LCO 3.6.1, "Containment," which requires that containment be restored to OPERABLE status within 1 hour.

B.1 and B.2

Unit

If containment air partial 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 3.6.4B.1

Verifying that containment air partial pressure is within limits ensures that operation remains within the limits assumed in the containment analysis. The 12 hour Frequency

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4B.1 (continued)

of this SR was developed considering operating experience related to trending of containment pressure variations and pressure instrument drift during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment pressure condition.

REFERENCES

1. FSAR, Section [6.2].
2. 10 CFR 50, Appendix K.

Rev. 0

1. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

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

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

5. The NAPS maximum peak containment pressure results from the limiting design basis steam line break, not the design basis LOCA as stated in the ISTS Bases. The referenced parameter, P_a, is related to the LOCA. Therefore, the reference to P_a is deleted.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.5C Containment Air Temperature (Subatmospheric)

BASES

BACKGROUND

The containment structure serves to contain radioactive material that may be released from the reactor core following a Design Basis Accident (DBA). The containment average air temperature 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).

The containment average air temperature limit is derived from the input conditions used in the containment functional analyses and the containment structure external pressure analyses. This LCO ensures that initial conditions assumed in the analysis of containment response to a DBA are not violated during unit operations. The total amount of energy to be removed from containment by the Containment Spray and Cooling systems during post accident conditions is dependent upon the energy released to the containment due to the event, as well as the initial containment temperature and pressure. The higher the initial temperature, the more energy which must be removed, resulting in a higher peak containment pressure and temperature. Exceeding containment design pressure may result in leakage greater than that assumed in the accident analysis. Operation with containment temperature in excess of the LCO limit violates an initial condition assumed in the accident analysis.

APPLICABLE SAFETY ANALYSES

Containment average air temperature is an initial condition used in the DBA analyses that establishes the containment environmental qualification operating envelope for both pressure and temperature. The limit for containment average air temperature ensures that operation is maintained within the assumptions used in the DBA analyses for containment (Ref. 1).

The limiting DBAs considered relative to containment OPERABILITY are the LOCA and SLB. The DBA LOCA and SLB are analyzed using computer codes designed to predict the resultant containment pressure transients. No two DBAs are assumed to occur simultaneously or consecutively. The

(continued)

Rev. 0

BASES

APPLICABLE SAFETY ANALYSES (continued)

postulated DBAs are analyzed with regard to containment Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure, resulting in one train of the Quench Spray (QS) System and Recirculation Spray System being rendered inoperable.

The limiting DBA for the maximum peak containment air temperature is an SLB. The initial containment average air temperature assumed in the design basis analyses (Ref. 1) is [120]°F. This resulted in a maximum containment air temperature of [357]°F. The design temperature is [347]°F.

The temperature upper limit is used to establish the environmental qualification operating envelope for containment. The maximum peak containment air temperature was calculated to exceed the containment design temperature for only a few seconds during the transient. The basis of the containment design temperature, however, is to ensure the performance of safety related equipment inside containment (Ref. 2). Thermal analyses showed that the time interval during which the containment air temperature exceeded the containment design temperature was short enough that the equipment surface temperatures remained below the design temperature. Therefore, it is concluded that the calculated transient containment air temperature is acceptable for the DBA SLB.

The temperature upper limit is also used in the depressurization analyses to ensure that the minimum pressure limit is maintained following an inadvertent actuation of the QS System (Ref. 1).

The containment pressure transient is sensitive to the initial air mass in containment and, therefore, to the initial containment air temperature. The limiting DBA for establishing the maximum peak containment internal pressure is a LOCA. The temperature lower limit is used in this analysis to ensure that, in the event of an accident, the maximum containment internal pressure will not be exceeded.

Containment average air temperature satisfies Criterion 2 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

During a DBA, with an initial containment average temperature less than or equal to the LCO temperature limits, the resultant peak accident temperature is maintained below the containment design temperature. As a result, the ability of containment to perform its design function is ensured.

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, maintaining containment average air temperature within the limit is not required in MODE 5 or 6.

ACTIONS

A.1

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

B.1 and B.2

If the containment average air temperature cannot be restored to within its 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.

(continued)

Rev. 0

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.5~~0~~.1

Verifying that containment average air temperature is within the LCO limits ensures that containment operation remains within the limits assumed for the containment analyses. In order to determine the containment average air temperature, a weighted average is calculated using measurements taken at locations within containment selected to provide a representative sample of the overall containment atmosphere. The 24 hour Frequency of this SR is considered acceptable based on observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal containment temperature condition.

REFERENCES

1. FSAR, Section [6.2].
2. 10 CFR 50.49.

Rev.0

1. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

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

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

5. The Bases are revised to state that the maximum peak containment pressure results from the limiting design basis steam line break, not the design basis LOCA, and that the temperature upper limit is used in the analysis, not lower limit. These changes are necessary to reflect the North Anna design basis.

6. The Applicability description is revised to reflect that the limiting accident is a steam line break, not a LOCA as described in the ISTS.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.6D Quench Spray (QS) System ~~(Subatmospheric)~~

BASES

BACKGROUND

The QS System is designed to provide containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. The QS System, operating in conjunction with the Recirculation Spray (RS) System, is designed to cool and depressurize the containment structure to subatmospheric pressure in less than 60 minutes following a Design Basis Accident (DBA). Reduction of containment pressure and the iodine removal capability of the spray limit the release of fission product radioactivity from containment to the environment in the event of a DBA.

The QS System consists of ~~two~~ a dedicated separate trains of equal capacity, each capable of meeting the design bases. Each train includes a spray pump, spray header, nozzles, valves, and piping. Each train is powered from a separate Engineered Safety Features (ESF) bus. The refueling water storage tank (RWST) supplies borated water to the QS System.

The QS System is actuated either automatically by a containment High-High pressure signal or manually. The QS System provides a spray of cold borated water into the upper regions of containment to reduce the containment pressure and temperature during a DBA. Each train of the QS System provides adequate spray coverage to meet the system design requirements for containment heat and iodine fission product removal. The QS System also provides flow to the containment sump to improve the net positive suction head available ~~to the RS System pumps~~.

Inside RS pumps

Chemical Addition System supplies

The ~~Spray Additive System injects~~ a sodium hydroxide (NaOH) solution into the spray. The resulting alkaline pH of the spray enhances the ability of the spray to scavenge iodine fission products from the containment atmosphere. The NaOH added to the spray also ensures an alkaline pH for the solution recirculated in the containment sump. The 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.

(continued)

Rev. 0

BASES

BACKGROUND (continued)

The QS System is a containment ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. Operation of the QS System and RS System provides the required heat removal capability to limit post accident conditions to less than the containment design values and depressurize the containment structure to subatmospheric pressure in < 60 minutes following a DBA.

The QS System limits the temperature and pressure that could be expected following a DBA and ensures that containment leakage is maintained consistent with the accident analysis.

APPLICABLE SAFETY ANALYSES

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. No DBAs are assumed to occur simultaneously or consecutively. The postulated DBAs are analyzed, with respect to containment ESF Systems, assuming the loss of one ESF bus, which is the worst case single active failure, resulting in one train of the QS System and the RS System inoperable.

emergency diesel generator

no offsite power and

During normal operation, the containment internal pressure is varied, to maintain the capability to depressurize the containment to a subatmospheric pressure in < 60 minutes after a DBA. This capability and the variation of containment pressure are functions of the service water temperature, the RWST water temperature, and the containment air temperature.

, along with other parameters,

during a DBA

The DBA analyses (Ref. 1) show that the maximum peak containment pressure of 44.1 psig results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum peak containment atmosphere temperature of 285 °F results from the SLB analysis and was calculated to exceed the containment design temperature for a few seconds during the transient. The basis of the containment design temperature, however, is to ensure OPERABILITY of safety related equipment inside containment (Ref. 2). Thermal analyses show that the time interval during which the containment atmosphere temperature exceeded the containment design temperature was short enough that the

44.9

SLB

357

a relatively short period of time

(continued)

Rev. 0

APPLICABLE SAFETY ANALYSES (continued)

~~equipment surface temperatures remained below the design temperature.~~ Therefore, it is concluded that the calculated transient containment atmosphere temperatures are acceptable for the SLB.

The modeled QS System actuation from the containment analysis is based upon a response time associated with exceeding the containment High-High pressure signal setpoint to achieving full flow through the spray nozzles. A delayed response time initiation provides conservative analyses of peak calculated containment temperature and pressure responses. The QS System total response time of ~~60~~ 71.1 seconds comprises the signal delay, diesel generator startup time, and system startup time. (5)

For certain aspects of 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. For these calculations, the containment 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. 3).

Inadvertent actuation of the QS System is evaluated in the analysis, and the resultant reduction in containment pressure is calculated. ~~The maximum calculated reduction in containment pressure resulted in a containment external pressure load of [unit specific pressure], which is below the containment design external pressure load.~~ (2)

results in containment pressures within the design containment minimum pressure.

The QS System satisfies Criterion 3 of ~~the NRC Policy Statement.~~ 10 CFR 50.36 (c)(2)(ii) (6)

LCO

During a DBA, one train of the QS System is required to provide the heat removal capability assumed in the safety analyses for containment. In addition, one QS System train, with spray pH adjusted by the ~~Spray Additive System~~ Contents of the chemical addition tank, is required to scavenge iodine fission products from the containment atmosphere and ensure their retention in the containment sump water. To ensure that these requirements are met, two QS System trains must be OPERABLE with power from two safety related, independent power supplies. (3)

(continued)

BASES

LCO (continued)

Therefore, in the event of an accident, at least one train ~~in each system~~ of QS will operate, assuming that the worst case single active failure occurs.

Each QS ~~System~~ train includes a spray pump, a dedicated spray header, nozzles, valves, piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment and an increase in containment pressure and temperature requiring the operation of the QS System.

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 QS System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If one QS train is inoperable, it must be restored to available OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal and iodine removal needs after an accident. The 72 hour Completion Time was developed taking into account the redundant heat removal and iodine removal capabilities afforded by the OPERABLE train and the low probability of a DBA occurring during this period.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the ~~plant~~ Unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the ~~plant~~ Unit 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~~ Unit conditions from full power conditions in an orderly manner and without challenging ~~plant~~ Unit systems.

(continued)

Rev.0

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6~~0~~.1 1

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the QS System provides assurance that the proper flow path exists for QS System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they were verified to be in the correct position prior to being secured. 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.

SR 3.6.6~~0~~.2 1

Verifying that each QS pump's developed head at the flow test point is greater than or equal to the required developed head ensures that QS pump performance ~~has not degraded during the cycle~~ is consistent with the safety analysis assumptions 3. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the QS System pumps cannot be tested with flow through the spray headers, they are tested on ~~bypass~~ recirculation 4 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 incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.6~~0~~.3 and SR 3.6.6~~0~~.4 1

These SRs ensure that each QS automatic valve actuates to its correct position and each QS pump starts upon receipt of an actual or simulated containment ~~spray actuation~~ Pressure-high-high 4 signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The ~~18~~ 5 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a ~~plant~~ unit 3 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

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6~~0~~.3 and SR 3.6.6~~0~~.4 (continued) 1

pass the Surveillances when performed at an ~~(~~18~~)~~ month 5
Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6~~0~~.5 quench

and the non-corrosive design of the system

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 that spray coverage of the containment during an accident is not degraded. Due to the passive nature of the design of the nozzle, a test at ~~[the first refueling and at]~~ 10 year intervals is considered adequate to detect obstruction of the nozzles. 3 1 2

REFERENCES 3 5

1. ~~(~~U~~)~~FSAR, Section ~~(~~16.2~~)~~.
2. 10 CFR 50.49.
3. 10 CFR 50, Appendix K.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

Rev.0

1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages were made.

2. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

3. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

4. Information is moved from the current Technical Specifications to the Bases.

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

6. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

7. The ITS Bases ASA section adds the phrase "during a DBA" to qualify that the parameters being discussed, Service Water temperature, RWST water temperature, and the containment air temperature affect containment pressure during a DBA and not normal operation as the ISTS paragraph could imply. This deviation is acceptable because it reflects the NAPS analysis.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~6E~~ 7 Recirculation Spray (RS) System ~~(Subatmospheric)~~

BASES

BACKGROUND

The RS System, operating in conjunction with the Quench Spray (QS) System, is designed to limit the post accident pressure and temperature in the containment to less than the design values and to depressurize the containment structure to a subatmospheric pressure in less than 60 minutes following a Design Basis Accident (DBA). The reduction of containment pressure and the removal of iodine from the containment atmosphere by the spray limit the release of fission product radioactivity from containment to the environment in the event of a DBA.

The RS System consists of two separate trains of equal capacity, each capable of meeting the design and accident analysis bases. Each train includes one RS subsystem outside containment and one RS subsystem inside containment. Each subsystem consists of one approximately 50% capacity spray pump, one spray cooler, one 180° coverage spray header, nozzles, valves, piping, instrumentation, and controls. Each outside RS subsystem also includes a casing cooling pump with its own valves, piping, instrumentation, and controls. The two outside RS subsystems' spray pumps are located outside containment and the two inside RS subsystems' spray pumps are located inside containment. Each RS train (one inside and one outside RS subsystem) is powered from a separate Engineered Safety Features (ESF) bus. Each train of the RS System provides adequate spray coverage to meet the system design requirements for containment heat and iodine fission product removal.

Two spray pumps are required to provide the 360° of containment spray coverage assumed in the accident analysis. One train of RS or two outside RS subsystems will provide the containment spray coverage and required flow.

The two casing cooling pumps and common casing cooling tank are designed to increase the net positive suction head (NPSH) available to the outside RS pumps by injecting cold water into the suction of the spray pumps. The casing cooling water tank contains at least 116,500 gal of chilled and borated water. Each casing cooling pump supplies one outside spray pump with cold borated water from the casing cooling water tank. The casing cooling pumps are considered part of the outside RS subsystems. Each casing cooling pump is powered from a separate ESF bus.

They are also beneficial to the containment depressurization analysis.

(continued)

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BASES

BACKGROUND (continued)

The RS System provides a spray of subcooled water into the upper regions of containment to reduce the containment pressure and temperature during a DBA. Upon receipt of a High-High containment pressure signal, the two casing cooling pumps start, the casing cooling discharge valves open, and the RS pump suction and discharge valves receive an open signal to assure the valves are open. After a [195] second time delay, the inside RS pumps start, and after a [210] second time delay, the outside RS pumps start. The RS pumps take suction from the containment sump and discharge through their respective spray coolers to the spray headers and into the containment atmosphere. Heat is transferred from the containment sump water to service water in the spray coolers.

195 ± 9.75

210 ± 21

The Spray Additive System injects a sodium hydroxide (NaOH) solution into the suction of the QS System pumps. The NaOH added to the QS System spray ensures an alkaline pH for the solution recirculated in the containment sump. The resulting alkaline pH of the RS spray (pumped from the sump) enhances the ability of the spray to scavenge iodine fission products from the containment atmosphere. The 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.

Chemical Additron

Supplies

to the RWST water supplied to

The RS is a containment ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. Operation of the QS and RS systems provides the required heat removal capability to limit post accident conditions to less than the containment design values and depressurize the containment structure to subatmospheric pressure in < 60 minutes following a DBA.

System

The RS limits the temperature and pressure that could be expected following a DBA and ensures that containment leakage is maintained consistent with the accident analysis.

APPLICABLE SAFETY ANALYSES

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; DBAs are assumed not to occur simultaneously or

(continued)

Rev. 0

BASES

emergency diesel generator

APPLICABLE SAFETY ANALYSES (continued)

consecutively. The postulated DBAs are analyzed assuming the loss of one ESF bus, which is the worst case single active failure, resulting in one train of the QS and RS systems being rendered inoperable (Ref. 1) for containment depressurization.

no offsite power and

The peak containment pressure following a high energy line break is affected by the initial total pressure and temperature of the containment atmosphere and the QS System operation. Maximizing the initial containment total pressure and average atmospheric temperature maximizes the calculated peak pressure. The heat removal effectiveness of the QS System spray is dependent on the temperature of the water in the refueling water storage tank (RWST). The time required to depressurize the containment and the capability to maintain it depressurized below atmospheric pressure depend on the functional performance of the QS and RS systems and the service water temperature. When the Service Water temperature is elevated, it is more difficult to depressurize the containment within 60 minutes since the heat removal effectiveness of the RS System is limited.

During normal operation, the containment internal pressure is varied to maintain the capability to depressurize the containment to a subatmospheric pressure in ≤60 minutes after a DBA. This capability and the variation of containment pressure are functions of service water temperature, RWST water temperature, and the containment air temperature.

less than

The DBA analyses show that the maximum peak containment pressure of 44.1 psig results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum 365 °F peak containment atmosphere temperature results from the SLB analysis and is calculated to exceed the containment design temperature for a few seconds during the transient. The basis of the containment design temperature, however, is to ensure OPERABILITY of safety related equipment inside containment (Ref. 2). Thermal analyses show that the time interval during which the containment atmosphere temperature exceeds the containment design temperature is short enough that equipment surface temperatures remain below the design temperature. Therefore, it is concluded that the calculated transient containment atmosphere temperatures are acceptable for the SLB.

44.9 SLB 357.4

a relatively short period of time

there would be no adverse effect on equipment inside containment.

and LOCA

(continued)

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The RS System actuation model from the containment analysis is based upon a response time associated with exceeding the High-High containment pressure signal setpoint to achieving full flow through the RS System spray nozzles. A delay in response time initiation provides conservative analyses of peak calculated containment temperature and pressure. The RS System's total response time of 300 seconds comprises the signal delay, diesel generator startup time, and system startup time.

is determined by the delay timers

For certain aspects of 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. For these calculations, the containment 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. 3).

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

LCO

During a DBA, one train (two subsystems) of the RS System is required to provide the minimum heat removal capability assumed in the safety analysis. To ensure that this requirement is met, four RS subsystems and casing cooling tank must be OPERABLE. This will ensure that at least one train will operate assuming the worst case single failure occurs, which is in the ESF power supply.

or two outside RS subsystems

are

the

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the RS System.

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 RS System is not required to be OPERABLE in MODE 5 or 6.

one inside and one outside RS subsystem in the same train.

no offsite power and the loss of one emergency diesel generator.

(continued)

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BASES (continued)

ACTIONS

A.1

With one of the RS subsystems inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. The components in this degraded condition are capable of providing at least 100% of the heat removal needs (i.e., approximately 150% when one RS subsystem is inoperable) after an accident. The 7 day Completion Time was developed taking into account the redundant heat removal capabilities afforded by combinations of the RS and QS systems and the low probability of a DBA occurring during this period.

B.1 and C.1.

With two of the required RS subsystems inoperable either in the same train, or both inside RS subsystems ~~in the same train~~, at least one of the inoperable RS subsystems must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal needs and 360° containment spray coverage after an accident. The 72 hour Completion Time was developed taking into account the redundant heat removal capability afforded by the OPERABLE subsystems, a reasonable amount of time for repairs, and the low probability of a DBA occurring during this period.

~~C.1~~

~~With two inside RS subsystems inoperable, at least one of the inoperable subsystems must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal needs after an accident. The 72 hour Completion Time was chosen based on the same reasons as given in Required Action B.1.~~

~~D.1~~

~~With two outside RS subsystems inoperable, at least one of the inoperable subsystems must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal needs after an accident. The 72 hour Completion Time was~~

(continued)

Rev. 0

BASES

ACTIONS

D.1 (continued)

chosen based on the same reasons as given in Required Action B.1.

D.1

both

With the casing cooling tank inoperable, the NPSH available to the outside RS subsystem pumps may not be sufficient. The inoperable casing cooling tank must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the heat removal needs after an accident. The 72 hour Completion Time was chosen based on the same reasons as given in Required Action B.1.

The casing cooling tank does not affect the OPERABILITY of the inside RS subsystem pumps. The effect of NPSH on outside RS pumps is evaluated as part of outside RS pump OPERABILITY.

E.1 and E.2

If the inoperable RS subsystem(s) or the casing cooling tank 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 additional time and is reasonable considering that the driving force for a release of radioactive material from the Reactor Coolant System is reduced in MODE 3.

unit

F.1

With three or more RS subsystems inoperable, the unit is in a condition outside the accident analysis. Therefore, in all three cases, LCO 3.0.3 must be entered immediately.

With an inoperable inside RS subsystem in one train, and an inoperable outside RS subsystem in the other train, only 180° containment spray coverage is available. This condition is outside accident analysis.

(continued)

With two inoperable outside RS subsystems, less than 100% of required RS flow is available.

Rev. 0

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6E.1

Verifying that the casing cooling tank solution temperature is within the specified tolerances provides assurance that the water injected into the suction of the outside RS pumps will increase the NPSH available as per design. The 24 hour Frequency of this SR was developed considering operating experience related to the parameter variations and instrument drift during the applicable MODES. Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.6E.2

Verifying the casing cooling tank contained borated water volume provides assurance that sufficient water is available to support the outside RS subsystem pumps during the time they are required to operate. The 7 day Frequency of this SR was developed considering operating experience related to the parameter variations and instrument drift during the applicable MODES. Furthermore, the 7 day Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal condition.

SR 3.6.6E.3

Verifying the boron concentration of the solution in the casing cooling tank provides assurance that borated water added from the casing cooling tank to RS subsystems will not dilute the solution being recirculated in the containment sump. The 7 day Frequency of this SR was developed considering the known stability of stored borated water and the low probability of any source of diluting pure water.

SR 3.6.6E.4

Verifying the correct alignment of manual, power operated, and automatic valves, excluding check valves, in the RS System and casing cooling tank provides assurance that the proper flow path exists for operation of the RS System. This SR does not apply to valves that are locked, sealed, or

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.~~62~~ 7.4 (continued)

otherwise secured in position, since they are verified as being in the correct position prior to being secured. 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.

SR 3.6.~~62~~ 7.5

Verifying that each RS ~~[~~and casing cooling~~]~~ pump's developed head at the flow test point is greater than or equal to the required developed head ensures that these pumps' performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the ~~CS~~ RS System pumps cannot be tested with flow through the spray headers, they are tested on ~~bypass~~ 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 incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.~~62~~ 7.6

These SRs ensure that each automatic valve actuates and that the RS System and casing cooling pumps start upon receipt of an actual or simulated High-High containment pressure signal. Start delay times are also verified for the RS System pumps. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The ~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a ~~plant~~ unit 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]~~ 18 month Frequency. Therefore, the Frequency was considered to be acceptable from a reliability standpoint.

(continued)

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6E.7

This SR ensures that each spray nozzle is unobstructed and that spray coverage of the containment will meet its design bases objective. An air or smoke test is performed through each spray header. Due to the passive design of the spray header and its normally dry state, a test at [the first refueling and at] 10 year intervals is considered adequate for detecting obstruction of the nozzles.

REFERENCES

1. FSAR, Section 6.2.
2. 10 CFR 50.49.
3. 10 CFR 50, Appendix K.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

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1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages were made.

2. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to the Bases incorporating information relocated from the CTS.

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

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

6. The North Anna Recirculation Spray (RS) System consists of 2 trains. Each train consists of an inside RS subsystem and outside RS subsystem. The outside RS subsystems are supported by a casing cooling tank. Each subsystem supplies water to a spray header which covers 180° of the containment, for a total of 4 spray headers. The Required Actions when two subsystems are inoperable must consider both the available heat removal capacity and the available spray coverage. The accident analysis assumes that 360° of spray coverage is available. In order to clarify this aspect of the North Anna design, the combination of two inoperable RS subsystems which does provide 360° of containment spray coverage is added to the ACTION for inadequate heat removal. The Bases are enhanced to explain the requirements. The Bases for the acceptable combinations of inoperable equipment (Actions B.1and C.1) are combined and expanded. This deviation reflects the North Anna design and provides ACTIONS for all combinations of inoperable RS subsystems and makes clear which combinations are acceptable and why those combinations are acceptable.

7. Changes are made to reflect those changes made to the ISTS.

8. The Applicable Safety Analysis response time discussion has been revised to state that "...the response time is determined by the delay timers..." to reflect that once an initiating signal is received, the delay timer (195 seconds for IRS and 210 seconds for ORS) determines the total system response time because it encompasses any other system actuation time.

9. The single failure analysis for a LOCA assumes the worst case single active failure for postulated DBAs to be the loss of offsite power and loss of one emergency diesel

generator. References to the worst case single active failure are modified to reflect this plant specific assumption.

10. In ISTS 3.6.6E Background and Action A.1 Bases sections, the word "approximately" is added to "50%" and "150%," respectively. This is in reference to the RS heat removal capability of one RS subsystem and 3 RS subsystems, respectively. The exact capacity for each RS subsystem varies, but is approximately 50%. Adding this change makes the statements more accurate.

BASES

Chemical Addition System 1

BACKGROUND

The ~~Spray Additive System~~ is a subsystem of the ~~Containment~~ Quench Spray System that assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a Design Basis Accident (DBA). 2

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. The NaOH added to the spray also ensures a pH value of between ~~8.5~~ 7.0 and ~~11.0~~ 9.5 of the solution recirculated from the containment sump. This pH band minimizes the evolution of iodine as well as the occurrence of chloride and caustic stress corrosion on mechanical systems and components. 2

~~Eductor Feed Systems Only~~

~~The Spray Additive System consists of one spray additive tank that is shared by the two trains of spray additive equipment. Each train of equipment provides a flow path 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.~~ 2

(continued)

BASES

BACKGROUND (continued)

Gravity Feed Systems Only — Chemical Addition System

The Spray Additive System consists of one spray additive tank, two parallel redundant motor operated valves in the line between the additive tank and the refueling water storage tank (RWST), instrumentation, and recirculation pumps. The NaOH solution is added to the spray water by a balanced gravity feed 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 ≤ 11.0 (10.5)

chemical addition

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 the valves from the spray additive tank after a 5 minute delay. The 28% to 31% NaOH solution is drawn into 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 ≥ 9.0 (7.0) and ≤ 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.

Quench — chemical addition — quench — 12% — 13% — chemical addition tank

APPLICABLE SAFETY ANALYSES

The Spray Additive System is essential to the removal of airborne iodine within containment following a DBA. — Chemical Addition System

Following the assumed release of radioactive materials into containment, the containment is assumed to leak at its design value volume following the accident. The analysis assumes that 100% of containment is covered by the spray (Ref. 1). — analysis

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 3.6.6, "Containment Spray and Cooling Systems." — Chemical Addition — based on the chemical Addition System isolation valves beginning to open 5 minutes after a QS pump start

(continued)

The plant accident dose calculations use an effective containment coverage of 70% of the containment volume. The containment safety analyses implicitly assume that the containment atmosphere is so turbulent following an accidental release of high energy fluids inside containment that, for heat removal purposes, the containment volume is effectively completely covered by spray.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

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

Chemical addition

Chemical Addition

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

LCO

Chemical Addition

Quench

The ~~Spray Additive~~ Chemical addition 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 provide NaOH injection into the spray flow until the ~~Containment~~ Spray System ~~suction path is switched~~ has completed pumping water 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 ~~[7.2 and 11.0]~~ 8.5 and 10.5. 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. In addition, it is essential that valves in the ~~Spray Additive~~ Chemical Addition System flow paths are properly positioned and that automatic valves are capable of activating to their correct positions.

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~~ Chemical Addition System. The ~~Spray Additive~~ Chemical Addition 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~~ Chemical Addition System is not required to be OPERABLE in MODE 5 or 6.

ACTIONS

A.1

If the ~~Spray Additive~~ Chemical Addition System is inoperable, it must be restored to OPERABLE within 72 hours. The pH adjustment of

(continued)

BASES

ACTIONS

A.1 (continued)

Quench

the ~~Containment~~ Spray System flow for ~~corrosion protection~~ ~~and~~ iodine ~~removal~~ enhancement is reduced in this 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 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.

ability of the Quench Spray System to remove iodine at a reduced capability using the

Quench Spray

B.1 and B.2

Chemical Addition

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 pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

unit

unit

Chemical Addition

SURVEILLANCE REQUIREMENTS

SR 3.6.~~7~~.1 8

Chemical Addition

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 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.

chemical addition

Quench

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~7~~ 8.2

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~~ chemical addition 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~~ Chemical Addition 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.~~7~~ 8.3

This SR provides verification, by chemical analysis, of the NaOH concentration in the ~~spray additive~~ chemical addition 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~~ chemical addition tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

SR 3.6.~~7~~ 8.4

This SR provides verification that each automatic valve in the ~~Spray Additive~~ Chemical Addition 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 ~~7~~ 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a ~~plant~~ unit 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 ~~7~~ 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~7~~ 8.5

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.

from

Quench

Chemical Addition

Quench

chemical addition

by draining solution from the RWST and chemical addition tank through the drain lines in the cross connection between the tanks.

REFERENCES

1. ~~FSAR, Chapter [15].~~ None.

1. North Anna Units 1 and 2 utilize subatmospheric containments. Therefore, the NUREG-1431 specifications applicable to that containment design were used in developing the plant-specific Improved Technical Specifications (ITS). Necessary editorial changes to the NUREG-1431 pages, including renumbering of specifications, were made. North Anna also utilizes a Chemical Addition System which is referred to as a Spray Additive System in NUREG-1431. The Chemical Addition System includes a chemical addition tank instead of a spray additive tank. The names have been corrected in the ITS.

2. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Information is moved from the current Technical Specifications to the Bases.

4. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

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

7. Different RS system response times are used for different accident analyses. Therefore, the specific values are not included in the ITS Bases.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8a Hydrogen Recombiners (Atmospheric, Subatmospheric, Ice Condenser, and Dual) (if permanently installed)

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).

Two 100% capacity independent hydrogen recombiner systems are provided. Each consists of controls located in the 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 4.1 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.

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 4.1 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.

(continued)

Rev. 0

BASES

APPLICABLE SAFETY ANALYSES (continued)

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 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 8 days after the LOCA and 4.0 v/o about 2 days later if no recombiner was functioning (Ref. 3). Initiating the hydrogen recombiners when the primary containment hydrogen concentration reaches 3.5 v/o 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. 4). The Hydrogen Purge System is similarly designed such that one of two redundant trains is an adequate backup to the redundant hydrogen recombiners.

The hydrogen recombiners satisfy Criterion 3 of the NRC Policy Statement.

(continued)

Rev. 0

BASES (continued)

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.

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 4.1 v/o following a LOCA, assuming a worst case single failure.

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.

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.

(continued)

Rev. 0

BASES

ACTIONS

A.1 (continued)

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 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.

B.1 and B.2

[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 reasonable time to allow two hydrogen recombiners to be inoperable because the hydrogen control function is

atmosphere cleanup system containment purge blowers

(continued)

Rev. 0

BASES

ACTIONS

B.1 and B.2 (continued)

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.

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.

Unit

Unit

SURVEILLANCE REQUIREMENTS

SR 3.6.9.1

and is maintained for at least 2 hours, and that each hydrogen recombiner purge blower operates for at least 15 minutes

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.

Then, using containment atmospheric air at a flow rate of ≥ 50 scfm, the SR verifies that the heater temperature increases to ≥ 1100°F within 5 hours and is maintained for at least 4 hours.

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.

SR 3.6.9.2

This SR ensures there are no physical problems that could affect recombiner operation. Since the recombiners are mechanically passive, they are not subject to mechanical failure. The only credible failure involves loss of power, blockage of the internal flow, missile impact, etc.

s include fan failure,

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.9.2 (continued)

A visual inspection is sufficient to determine abnormal conditions that could cause such failures (i.e. loose wiring or structural connections, deposits of foreign materials, etc.). The [18] month Frequency for this SR was developed considering the incidence of hydrogen recombiners failing the SR in the past is low.

SR 3.6.9.3

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 after performance of SR 3.6.9.1.

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

REFERENCES

1. 10 CFR 50.44. ULFSAR, Section 3.1.37
2. ~~10 CFR 50, Appendix A, GDC 41~~
3. Regulatory Guide 1.7, ~~Revision [1]~~. dated March 10, 1971
4. FSAR Section ~~15~~. 6.2.5

Rev. 0

1. The headings for ISTS 3.6.1 include the parenthetical expression (Atmospheric, Subatmospheric, Ice Condenser, and Dual). This identifying information is not included in the NAPS ITS. This information is provided in the NUREG to assist in identifying th appropriate specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. Therefore, necessary editorial changes were made. In addition, the specification is renumbered 3.6.9.

2. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Reviewer's Notes are deleted.

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

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

6. North Anna Units 1 and 2 were designed and constructed on the basis of the proposed General Design Criteria, published in 1966. Since February 20, 1971, when the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50, were published, the Company attempted to comply with the intent of the newer criteria to the extent practical, recognizing previous design commitments. The NRC's Safety Evaluation Report for North Anna Units 1 and 2 reviewed the plant against 10 CFR Part 50, Appendix A and concluded that the facility design conforms to the intent of the newer criteria. The North Anna UFSAR contains discussions comparing the design of the plant to the 10 CFR 50, Appendix A, General Design Criteria. Bases references to the 10 CFR 50, Appendix A criteria have been replaced with references to the appropriate section of the UFSAR.

7. Changes are made to the Bases incorporating information relocated from the CTS.

8. A phrase stating that the recombiners are mechanically passive is deleted because the recombiners include fans. The paragraph is modified to make it clear fan failure could occur.

9. The containment purge blowers of the atmosphere cleanup system are identified as being capable of providing alternate hydrogen control capabilities. The containment purge blowers can provide containment purge capability after a LOCA in case the recombiner system fails.

SECTION 3.6 - CONTAINMENT SYSTEMS

CURRENT TECHNICAL SPECIFICATIONS

MARKUP AND DISCUSSION OF CHANGES

UNIT 1

ITS

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 CONTAINMENT

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained* OPERABLE. A.4

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION: Inoperable to OPERABLE status

ACTION A.1 Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. A.4

ACTION B.1
ACTION B.2

SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated OPERABLE. A.4

a. At least once per 31 days by verifying that all penetrations not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves, secured in their positions, except for valves that are open under administrative control as permitted by Specification 3.6.3.1. <see ITS 3.6.3>

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3. A.2

c. After each closing of the equipment hatch, by leak rate testing the equipment hatch seals, with gas at P_a, greater than or equal to 44.1 psig. Results shall be evaluated against the criteria of Specification 3.6.1.2.b as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. <see ITS 5.5.15

d. Each time containment integrity is established after vacuum has been broken by pressure testing the butterfly isolation valves in the containment purge lines and the containment vacuum ejector line. <see ITS 5.5.15>

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* Except valves, blind flanges, and deactivated automatic valves which are located inside the containment and are locked sealed or otherwise sealed in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except that such surveillance need not be performed more often than once per 92 days. <see ITS 3.6.3>

ITS

CONTAINMENT SYSTEMS

CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

3.6.1

3.6.1.2 Containment ~~leakage rates~~ shall be ~~limited to:~~ OPERABLE (A.4)

a. An overall integrated leakage rate of less than or equal to L_a, 0.1 percent by weight of the containment air per 24 hours, at the calculated peak containment pressure P_a, greater than or equal to 44.1 psig.

b. A combined leakage rate of less than or equal to 0.60 L_a for all penetrations and valves subject to Type B and C tests, when pressurized to P_a, greater than or equal to 44.1 psig.

(see ITS 5.5.15)

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

ACTION: Insert Proposed ACTIONS A and B (A.5)

With either (a) the measured overall integrated containment leakage rate exceeding 0.75 L_a or (b) with the measured combined leakage rate for all penetrations and valves subject to Type B and C tests exceeding 0.60 L_a, ~~restore the overall integrated leakage rate to less than 0.75 L_a and the combined leakage rate for all penetrations subject to Type B and C tests to less than or equal to 0.60 L_a prior to increasing the Reactor Coolant System temperature above 200°F.~~ (A.3)

(see ITS 5.5.15)

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

4.6.1.2 The containment and containment penetrations shall be tested by performing leakage rate testing ~~as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable.~~ (A.3)

in accordance with the Containment Leakage Rate Testing Program.

ITS

CONTAINMENT SYSTEMS

CONTAINMENT STRUCTURAL INTEGRITY

LIMITING CONDITIONS FOR OPERATION

OPERABLE

3.6.1.6 The structural integrity of the containment shall be maintained at a level consistent with the acceptance criteria in Specification 4.6.1.6.1. (A.4)

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION: OPERABLE status OPERABLE

ACTION A With the structural integrity of the containment not conforming to the above requirements, restore (A.4)

ACTION B the structural integrity to within the limits within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. (M.1)

1

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1 4.6.1.6.1 Containment Surfaces The structural integrity of the exposed accessible interior and exterior surfaces of the containment, including the liner plate shall be determined by performing visual examinations as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable. (A.3) (A.3)

the Containment Leakage Rate Testing Program

UNIT 2

ITS

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 CONTAINMENT

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1 Primary CONTAINMENT INTEGRITY shall be maintained. OPERABLE A.4

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION: Inoperable

Action A.1 Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. A.4

Action B.1
Action B.2

SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated: OPERABLE A.4

a. At least once per 31 days by verifying that all penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves, secured in their positions, except for valves that are open under administrative control as permitted by Specification 3.6.3.1. <see ITS 3.6.3>

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3. A.2

c. After each closing of the equipment hatch, by leak rate testing the equipment hatch seals, with gas at P_a, greater than or equal to 44.1 psig. Results shall be evaluated against the criteria of Specification 3.6.1.2.b as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. <see ITS 5.5.15>

d. Each time containment integrity is established after vacuum has been broken by pressure testing the butterfly isolation valves in the containment purge lines and the containment vacuum ejector line. <see ITS 5.5.15>

* Except valves, blind flanges and deactivated automatic valves which are located inside the containment and are locked sealed or otherwise sealed in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except that such surveillance need not be performed more often than once per 92 days. <see ITS 3.6.3>

ITS

CONTAINMENT SYSTEMS

CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

3.6.1 3.~~6~~.1.2 Containment ~~leakage rates~~ shall be ~~limited to~~ OPERABLE A.4

a. An overall integrated leakage rate of less than or equal to L_a, 0.1 percent by weight of the containment air per 24 hours, at the calculated peak containment pressure P_a, greater than or equal to 44.1 psig.

b. A combined leakage rate of less than or equal to 0.60 L_a for all penetrations and valves subject to Type B and C tests, when pressurized to P_a, greater than or equal to 44.1 psig.

See ITS 5.5.15

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

Insert Proposed ACTIONS A and B A.5

ACTION:

With either (a) the measured overall integrated containment leakage rate exceeding 0.75 L_a or (b) with the measured combined leakage rate for all penetrations and valves subject to Type B and C tests exceeding 0.60 L_a, ~~restore the overall integrated leakage rate to less than 0.75 L_a and the combined leakage rate for all penetrations subject to Type B and C tests to less than or equal to 0.60 L_a prior to increasing the Reactor Coolant System temperature above 200°F.~~

See ITS 5.5.15 A.3

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1 4.6.1.2 The containment and containment penetrations shall be tested by performing leakage rate testing ~~as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable.~~

in accordance with the Containment Leakage Rate Testing Program.

A.3

A.1

ITS 3.6.1

02-09-96

CONTAINMENT SYSTEMS

ITS

CONTAINMENT STRUCTURAL INTEGRITY

LIMITING CONDITIONS FOR OPERATION

OPERABLE

3.6.1.6 The structural integrity of the containment shall be maintained at a level consistent with the acceptance criteria in Specification 4.6.1.6.1. A.4

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION: OPERABLE status OPERABLE

With the structural integrity of the containment not conforming to the above requirements, restore the structural integrity to within the limits within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. A.4 M.1

Action A

Action B

1

SURVEILLANCE REQUIREMENTS

4.6.1.6.1 Containment Surfaces The structural integrity of the exposed accessible interior and exterior surfaces of the containment, including the liner plate shall be determined by performing visual examinations as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable. A3 A3

SR 3.6.1.1

the Containment Leakage Rate Testing Program

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A.2 CTS 4.6.1.1.b states, "Primary CONTAINMENT INTEGRITY shall be demonstrated...By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3." ITS does not include the reference to CTS 3.6.1.3, which is changed to ITS 3.6.2. This changes the CTS by not including a reference to another LCO that is required in the same Modes of Applicability regardless of the reference.

The purpose of the CTS 4.6.1.1.b is to provide assurance that each containment air lock is performing its function in support of CONTAINMENT INTEGRITY. This change is acceptable because ITS 3.6.2 provides assurance that containment air locks are OPERABLE without the reference in 3.6.1. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 CTS LCO 3.6.1.2, 3.6.1.2 Action, and Surveillance Requirement 4.6.1.6.1 reference specific 10 CFR 50, Appendix J, Option B requirements, and other specific leakage rate criteria. CTS 4.6.1.2 also states, "The provisions of Specification 4.0.2 are not applicable." ITS LCO 3.6.1 requires that containment be Operable, Action A.1 requires the containment be restored to Operable status, and Surveillance Requirement 3.6.1.1 requires performance of visual examinations and leakage rate testing except for containment air lock testing, in accordance with the Containment Leakage Rate Testing Program. ITS 5.5.16 states, "The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program." This changes CTS by referencing the appropriate 10 CFR 50, Appendix J, Option B requirements, stating that SR 3.0.2 (vice CTS 4.0.2) is not applicable, and placing other specific leakage rate criteria in the Containment Leakage Rate Testing Program requirements in ITS 5.5.16.

The purpose of ITS 3.6.1 is to ensure that the structural integrity of the containment will be maintained comparable to the original design standards for the life of the facility. This change is acceptable because the appropriate 10 CFR 50, Appendix J, Option B requirements, and other specific leakage rate criteria are retained in the Technical Specifications as part of ITS 5.5.16, the Containment Leakage Rate Testing Program. This change is designated as administrative because it does not result in technical changes to the CTS.

A.4 CTS 3.6.1.1 states, "Primary CONTAINMENT INTEGRITY shall be maintained." CTS 3.6.1.2 requires containment leakage rates be within specified parameters. CTS 3.6.1.6 requires that the structural integrity of the containment be maintained within specified parameters. ITS 3.6.1 states, "Containment shall be OPERABLE. " This changes the CTS by combining the containment requirements of CTS 3.6.1.1, CTS 3.6.1.2, and CTS 3.6.1.6 into one LCO.

The purpose of CTS 3.6.1.1, CTS 3.6.1.2, and CTS 3.6.1.6 is to provide requirements pertaining for containment OPERABILITY. This change is acceptable because moving these requirements to one LCO, ITS 3.6.1, centralizes the requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

A.5 CTS 3.6.1.2 Action does not state what action to take if specific leakage rate limits are not met while in the MODES of Applicability, and includes a requirement that the limits be met prior to entering the MODES of Applicability. Entry into CTS 3.0.3 is required if CTS 3.6.1.2 is not met while in the MODES of applicability. CTS 3.0.3 allows 1 hour to prepare and requires the unit to be in MODE 3 within 6 hours and MODE 5 within 36 hours. ITS 3.6.1 REQUIRED ACTION A.1 requires that if the containment is inoperable, it must be restored to OPERABLE status within 1 hour. ITS 3.6.1 Required Action A.1 requires that if the Required Action and associated Completion Time are not met, the unit be in MODE 3 within 6 hours, and MODE 5 within 36 hours. This changes CTS by stating the Required Actions rather than deferring to CTS 3.0.3.

The purpose of CTS 3.0.3 is to place the unit outside the MODE of Applicability within a reasonable amount of time in a controlled manner. CTS 3.6.1.2 is silent on these actions, deferring to CTS 3.0.3 for the actions to accomplish this. This change is acceptable because the Required Actions specified in ITS 3.6.1 adopt standard ITS structure for placing the unit outside the MODE of Applicability without changing the time specified to enter MODE 3 and MODE 5. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.6.1.6 Action states that if containment structural integrity does not meet specified requirements, the structural integrity must be restored to within limits within 24 hours. ITS 3.6.1 A.1 states that the containment shall be restored to OPERABLE status within 1 hour. This changes CTS by requiring the structural integrity aspect of containment OPERABILITY be restored to OPERABLE status within 1 hour instead of 24 hours.

The purpose of CTS 3.6.1.6 is to ensure action is taken expeditiously to restore containment structural integrity if it is not within limits. This change is acceptable

because a 1 hour Completion Time is representative of the importance to take action expeditiously. Containment structural integrity problems once confirmed are unlikely to be corrected in as short a period of time as 1 or 24 hours. The 1 hour time frame is consistent with the ITS 3.0.3 requirement to make preparations to place the unit outside the MODE of Applicability. This change is considered more restrictive because the completion time for an action in the CTS is reduced.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

UNIT 1

CONTAINMENT SYSTEMS

CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

3.6.2 3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and

b. An overall air lock leakage rate of less than or equal to 0.05 L_a at P_a greater than or equal to 44.1 psig.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one containment air lock door inoperable:

Action A.1 1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.

Action A.2 2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed at least once per 31 days.

Action A.3 3. Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Action D.1 Action D.2 4. The provisions of Specification 3.0.4 are not applicable.

Action C.1 Action C.2 Action C.3 Action D.1 Action D.2 b. With containment air lock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed, restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each containment air lock shall be demonstrated OPERABLE:

SR 3.6.2.1 a. By performing leakage rate testing as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable.

SR 3.6.2.2 b. At least once per refueling outage by verifying that only one door in each air lock can be opened at a time.

Actions NOTE 1 c. Entry to repair the inner air lock door, if inoperable, is allowed.

UNIT 2

ITS

CONTAINMENT SYSTEMS

CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

A.1

3.6.2 3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and — LA.1

b. An overall air lock leakage rate of less than or equal to 0.05 L_a at P_a greater than or equal to 44.1 psig. — A.8

APPLICABILITY: MODES 1, 2, 3 and 4. Add proposed Condition A Note 1 + Note 2 — A.7 L.3

ACTION: — A.5

a. With one containment air lock door inoperable: — M.1

Action A.1 / Act. on A.2

1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed. — A.2 A.1

2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed at least once per 31 days. Add proposed Action A.3 NOTE — A.4 L.4

Action A.3

3. Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. — A.3

Action D.1 / Action D.2

4. The provisions of Specification 3.0.4 are not applicable. — M.1

Add proposed Condition B

b. With containment air lock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. — within 1 hour — interlock mechanism or — L.2 M.2 A.5

Add proposed Action C.1 / Action C.2 / Action C.3 / Action D.1 / Action D.2

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each containment air lock shall be demonstrated OPERABLE:

SR 3.6.2.1 — A.8

a. By performing leakage rate testing as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995. The provisions of Specification 4.0.2 are not applicable. — the Containment Leakage Rate Testing Program — L.5

b. At least once per refueling outage by verifying that only one door in each air lock can be opened at a time. — 24 months — L.6

SR 3.6.2.2

Actions NOTE 1 — L.1

a. Entry to repair the inner air lock door, if inoperable, is allowed. — and exit — affected — components — A.5

Add proposed Actions NOTE 2

Add proposed Actions NOTE 3 — A.6

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A.2 CTS 3.6.1.3 Action a.1 includes an Action requirement that states, "...and either restore the inoperable air lock to OPERABLE status..." ITS 3.6.2 Condition A does not include such an Action Requirement. This changes CTS by not explicitly stating that correcting the cause of Condition entry allows the Condition to be exited.

The purpose of the statement in CTS 3.6.1.3 Action a.1 is to make it clear that one option for exiting a Condition is to meet the LCO. This change is acceptable because the concept is stated in ITS 3.0.2. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 CTS 3.6.1.3.a.4 states, "The provisions of Specification 3.0.4 are not applicable." CTS 3.0.4 states, "Entry into an OPERATIONAL MODE or other specified applicability condition shall not be made unless the conditions of the Limiting Condition for Operation are met without reliance on provision contained in the ACTION statements unless otherwise excepted." ITS 3.6.2 does not contain the exception to ITS 3.0.4. ITS 3.0.4 states, "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time." This changes CTS by deleting a reference to a requirement which is changed in ITS in such a way that the reference is no longer required.

The purpose of CTS 3.6.1.3.a.4 is to provide an exception to the CTS 3.0.4. This change is considered acceptable because ITS 3.0.4 is structured such that these exceptions are not required. ITS 3.6.2 Actions allow continued operation for an unlimited period of time, which together with ITS 3.0.4 result in the same technical requirements as the CTS Actions. This change is designated as administrative because it does not result in technical changes to the CTS.

A.4 CTS 3.6.1.3 Action a.2 includes an Action requirement that states, "Operation may then continue until performance of the next required overall air lock leakage test provided that..." but does not include a requirement to perform such a test in response to entering the Condition. ITS 3.6.2 does not include such a statement. This changes CTS by deleting an exclusion for an Action that is not required.

This change is acceptable because operating until performance of the next required overall air lock leakage test is allowed without the deleted reference, if the specified Actions are taken. This change is designated as administrative because it does not result in technical changes to the CTS.

A.5 CTS 3.6.1.3 states, "Each containment air lock shall be OPERABLE..." CTS 3.6.1.3 Action a states, "With one containment air lock door inoperable:" and specifies Actions to be taken. CTS 3.6.1.3 Action b states, "With a containment air lock inoperable, except as a result of an inoperable air lock door," and specifies Actions to be taken. ITS Actions NOTE 2 states, "Separate Condition entry is allowed for each air lock." ITS Condition A states, "One or more containment air locks with one containment air lock door inoperable," and ITS Condition C states, "One or more containment air locks inoperable for reasons other than Condition A or B." This changes CTS by clarifying the current intent of applying the Actions to each air lock separately.

The purpose of CTS 3.6.1.3 is to ensure containment air locks meet their requirements for containment OPERABILITY. One OPERABLE air lock door in each containment air lock provides a pressure boundary, and applying the Actions for one inoperable air lock door to each of the air locks separately is appropriate. ITS 3.6.2 Actions NOTE 2 clearly states this. The Required Actions for each Condition provide appropriate compensatory action for each inoperable air lock. This change is acceptable because it clarifies existing requirements and better describes how the requirements are currently used. This change is designated as administrative because it does not result in technical changes to the CTS.

A.6 CTS 3.6.1.3 does not include a reference to entering applicable Conditions and Required Actions of the Containment OPERABILITY LCO (CTS 3.6.1.1). ITS 3.6.2 Actions NOTE 3 states, "Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when air lock leakage results in exceeding the overall containment leakage rate." This changes CTS by explicitly requiring the Containment Conditions be entered when the Containment LCO is not met as a result of air lock leakage exceeding limits.

This change is acceptable because it reinforces the requirement in ITS 3.6.1 to meet overall containment leakage limits. This change is designated as administrative because it does not result in technical changes to the CTS.

A.7 CTS 3.6.1.3 Action a addresses one inoperable containment air lock door, and CTS Action b addresses an inoperable containment air lock for reasons other than an inoperable air lock door, which includes both air lock doors in one air lock being inoperable. Either Action a or b would be taken. ITS 3.6.2 NOTE 1 of Required Actions A and B directs entry into Condition C when both doors in the same air lock are inoperable. This changes CTS by adding a NOTE to clarify that entry into

Condition C is required when both doors in the same air lock are inoperable, consistent with the CTS requirement.

This change is acceptable because the CTS requirement to enter one Action for one inoperable door in an air lock, and another Action for two inoperable doors in an air lock, is retained in ITS using ITS usage rules. This change is designated as administrative because it does not result in technical changes to the CTS.

A.8 CTS LCO 3.6.1.3 and Surveillance Requirement 4.6.1.3 reference specific 10 CFR 50, Appendix J, Option B requirements, and other specific leakage rate criteria. ITS LCO 3.6.2 requires that containment air locks be Operable and Surveillance Requirement 3.6.2.1 requires performance of containment air lock leakage rate testing, in accordance with the Containment Leakage Rate Testing Program. This changes CTS by referencing the appropriate 10 CFR 50, Appendix J, Option B requirements, and other specific leakage rate criteria in the Containment Leakage Rate Testing Program requirements in ITS 5.5.15.

The purpose of CTS 3.6.2 is to ensure that the structural integrity of the containment air locks will be maintained comparable to the original design standards for the life of the facility. This change is acceptable because the appropriate 10 CFR 50, Appendix J, Option B requirements, and other specific leakage rate criteria are retained in the Technical Specifications as part of ITS 5.5.15, the Containment Leakage Rate Testing Program. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.6.1.3.a.1 and CTS 3.6.1.3.b do not include a Completion Time for the action to maintain at least one containment air lock closed when a containment air lock door or a containment air lock is inoperable. ITS 3.6.2 Required Actions A.1, B.1, and C.2 require verifying the OPERABLE Containment air lock door closed in the affected air lock within 1 hour when the Conditions are entered. This changes CTS by specifying a Completion Time of 1 hour for verifying an OPERABLE air lock door is closed in an inoperable air lock.

The purpose of CTS 3.6.1.3.a.1 and CTS 3.6.1.3.b is to ensure that at least one air lock door is closed in the affected air lock when an air lock door or air lock is inoperable. This change is acceptable because it provides a specific Completion Time within which to perform the Action, which is consistent with the Completion Time to restore an inoperable containment to OPERABLE status. This change is considered more restrictive because it provides a new Completion Time for an Action.

M.2 CTS 3.6.1.3 does not contain an Action to, "initiate action to evaluate overall containment leakage rate." ITS 3.6.2 Required Action C.1 requires initiation of

action to evaluate overall containment leakage rate per ITS 3.6.1 immediately when one or more containment air locks are inoperable for reasons other than Condition A or B. This changes CTS by adding a new Required Action.

The purpose of ITS 3.6.2 Required Action C.1 is to verify that the overall leakage rate aspect of containment OPERABILITY is met in the event an airlock is inoperable for a reason other than one door or an interlock mechanism being inoperable. This change is acceptable because if the inoperability is something that could cause the overall containment leakage rate limits to be exceeded, this should be evaluated immediately, commensurate with the importance of the limits. One door or the interlock mechanism is not expected to result in exceeding these limits, and such action is not warranted for those conditions. This change is considered more restrictive because it provides a new Required Action.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS LCO 3.6.1.3 parts a and b state what constitutes an OPERABLE containment air lock. ITS LCO 3.6.2 does not include this level of detail. Part a of this detail is moved to the Bases of the ITS. This changes the CTS by moving details concerning what constitutes an OPERABLE containment air lock to the Bases.

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

LESS RESTRICTIVE CHANGES

L.1 *(Category 4 – Relaxation of Required Action)* CTS 3.6.1.3 footnote "+" allows entry to the air lock to repair the inner air lock door, if inoperable. ITS 3.6.2 contains an Action NOTE that allows entry and exit to perform repairs on the affected air lock

components. This changes CTS 3.6.1.3 by stating that exiting is allowed in addition to entry, and the entry can be for repairs on any affected air lock components, not just the inner air lock door.

The purpose of CTS 3.6.1.3 note is to allow entry to an air lock with an inoperable inner door for repairs to restore air lock OPERABILITY. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. This change allows more flexibility for entry and exit to an inoperable air lock for repairs to any air lock component. This change is acceptable because of the low probability of an event that could pressurize the containment during the short time the containment air lock is being accessed from the barrel side. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.2 *(Category 4 – Relaxation of Required Action)* CTS 3.6.1.3 does not contain a specific Action addressing an inoperable air lock interlock mechanism. CTS 3.6.1.3 Action b states, "With a containment air lock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed, restore the inoperable air lock to OPERABLE status within 24 hours, or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." ITS 3.6.2 Condition B requires that with a containment air lock interlock mechanism inoperable, an OPERABLE door is verified closed in the affected air lock within 1 hour, an OPERABLE door is closed in the affected air lock, and an OPERABLE door is verified locked closed in the affected air lock once per 31 days. Required Action NOTES indicate that these Required Actions are not applicable if both doors in the same air lock are inoperable and Condition C is entered, and entry and exit of containment is permissible under the control of a dedicated individual. This changes the CTS by allowing indefinite operation with an inoperable air lock interlock mechanism, and allows entry and exit of containment under the control of a dedicated individual.

The purpose of ITS 3.6.2 Condition B is to take appropriate Actions in response to inoperability of the air lock interlock mechanism. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of

required features, and the low probability of a DBA occurring during the repair period. This change provides additional allowances for the air lock interlock mechanism which does not determine whether or not the air lock can perform its function. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.3 *(Category 4 – Relaxation of Required Action)* CTS 3.6.1.3 does not provide an allowance for entry or exit through an air lock except for repair to the inner air lock door, if inoperable. ITS 3.6.2 Required Action A NOTE 2 states, "Entry and exit is permissible for 7 days under administrative controls if both air locks are inoperable." ITS 3.6.2 Required Action B NOTE 2 states, "Entry and exit of containment is permissible under the control of a dedicated individual." This changes CTS by allowing entry and exit of containment under specified criteria for any reason if both air locks are inoperable.

The purpose of ITS 3.6.2 NOTE 2 of Actions A and B is provide reasonable access to containment when both air locks are inoperable. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Actions for safe operation of the air lock must still be taken, and controls are placed on the use of the air lock commensurate with the importance of the air lock being able to perform its safety function. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.4 *(Category 4 – Relaxation of Required Action)* CTS 3.6.1.3 does not address how to verify locked closed air lock doors in high radiation areas. ITS 3.6.2 Required Actions A.3 and B.3 contain NOTES that provide an allowance for air lock doors in high radiation areas to be verified locked closed by administrative means when a containment air lock door or containment air lock interlock mechanism is inoperable. This changes CTS by allowing an air lock door in a high radiation area to be verified closed by administrative means.

The purpose of the note in ITS 3.6.2 Required Actions A.3 and B.3 is to provide reasonable assurance in a safe manner that air lock doors in high radiation areas are locked closed. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant

systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. The air lock doors are still required to be verified locked closed in the affected air lock. Considering the doors are locked and located in high radiation areas whose entry is closely controlled, verifying the doors closed administratively is reasonable. This avoids the risks and potential exposure associated with additional entries into high radiation areas. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.5 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS 4.6.1.3, which requires containment air lock leakage rate testing, states that the provisions of Specification 4.0.2 are not applicable. ITS SR 3.6.2.1 does not include this provision. This changes CTS by allowing ITS LCO SR 3.0.2 to be applied, which states that the specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

The purpose of ITS SR 3.6.2.1 is to provide assurance that the containment air locks are OPERABLE based on leakage rate testing. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. This change allows an additional 25% interval to be added to the Surveillance frequency, consistent with other Surveillances and NUREG-1431. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.6 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS 4.6.1.3.b, which requires testing of the containment airlock interlock once per refueling outage. For North Anna, a refueling outage testing frequency is equivalent to 18 months. ITS SR 3.6.2.2 requires testing of the containment airlock interlock every 24 months. This changes the CTS by decreasing the Frequency for the containment airlock interlock test from every 18 months to every 24 months.

The purpose of ITS SR 3.6.2.2 is to ensure that the containment airlock interlock prevents more than one of the containment airlock doors from opening at a time. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Performance of this Surveillance at power is undesirable because a failure of the SR during testing would lead to a loss of containment integrity and, for a subatmospheric containment, risk of personnel injury. In addition, the interlock is not normally challenged during containment airlock use as administrative procedures require strict adherence to single door opening. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

UNIT 1

A.1

ITS 3.6.3

ITS

3/4.6.3 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.3 3.6.3.1 Each containment isolation valve shall be OPERABLE.*

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

ACTION: Insert proposed Action Note 3 A.2
Insert proposed Action Note 4 A.3

Action Note 2 With one or more of the isolation valves inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and: A.8

a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or A.4

Action A.1 Action C.1 b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or 72 L.3

Action A.1 Action C.1 c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange; or

Insert proposed Condition B

Action D.1 Action D.2 d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. A.5

~~The provisions of Specification 3.0.4 do not apply.~~ A.6

SURVEILLANCE REQUIREMENTS

Insert proposed ACTIONS A.2 and C.2 M.1

4.6.3.1.1 Each containment isolation valve shall be demonstrated OPERABLE:

a. At least once per 92 days by cycling each weight or spring loaded check valve testable during plant operation, through one complete cycle of full travel and verifying that each check valve remains closed when the differential pressure in the direction of flow is less than 1.2 psid and opens when the differential pressure in the direction of flow is greater than or equal to 1.2 psid but less than 5.0 psid. A.10

except for 36 inch purge and exhaust valves, 18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction flowpaths, M.2

Action Note 1 * Locked or sealed closed valves may be opened on an intermittent basis under administrative control.

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ITS SURVEILLANCE REQUIREMENTS (Continued)

b. Prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of the applicable cycling test and verification of isolation time. L.1

4.6.3.1.2 Each containment isolation valve shall be demonstrated OPERABLE during the COLD SHUTDOWN or REFUELING MODE at least once per 18 months by: LA.1

SR 3.6.3.4

a. Verifying that on a Phase A containment isolation test signal, each Phase A isolation valve actuates to its isolation position.

b. Verifying that on a Phase B containment isolation test signal, each Phase B isolation valve actuates to its isolation position.

c. Verifying that on a Containment Purge and Exhaust isolation signal, each Purge and Exhaust valve actuates to its isolation position. <see ITS 3.9.4>

SR 3.6.3.5 d. Cycling each weight or spring loaded check valve not testable during plant operation, through one complete cycle of full travel and verifying that each check valve remains closed when the differential pressure in the direction of flow is less than 1.2 psid and opens when the differential pressure in the direction of flow is greater than or equal to 1.2 psid but less than 5.0 psid.

SR 3.6.3.3 4.6.3.1.3 The isolation time of each power operated or automatic containment isolation valve shall be determined to be within its limit when tested pursuant to Specification 4.0.5.

in accordance with the Inservice Testing Program

A.7

ITS

CONTAINMENT SYSTEMS

3/4.6.5 SUBATMOSPHERIC PRESSURE CONTROL SYSTEM

STEAM JET AIR EJECTOR

LIMITING CONDITION FOR OPERATION

isolate the affected penetration flowpath by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured (L.4)

3.6.3 ~~3.6.5.1~~ The inside and outside isolation valves in the steam jet air ejector suction line shall be closed.

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

Insert proposed Action Note 3 (A.2)

Insert proposed Action Note 4 (A.3)

ACTION: (A.8)

Action NOTE 2

Action A.1 With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position within ~~1~~ 4 hour or be in HOT SHUTDOWN within the next ~~12~~ 5 hours. (L.2)

MODE 3 within 6 hours and MODE 5 within 36 hours (M.3)

Action A.1
Action A.2

INSERT proposed Action A.2 (M.1)

INSERT proposed Condition B (A.5)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1 ~~4.6.5.1.1~~ The steam jet air ejector suction line outside isolation valve shall be determined to be in the closed position by a visual inspection prior to increasing the Reactor Coolant System temperature above 200°F and at least once per 31 days thereafter if the valve is not locked, sealed or otherwise secured in the closed position. (LA.2) (A.9)

SR 3.6.3.2 ~~4.6.5.1.2~~ The steam jet air ejector suction line inside isolation valve shall be determined to be in the closed position prior to increasing the Reactor Coolant System temperature above 200°F.

A.1

ITS 3.6.3

02-09-96

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 CONTAINMENT

ITS

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

<See ITS 3.6.1>

SURVEILLANCE REQUIREMENTS

<see ITS 3.6.1>

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

SR 3.6.3.1

INSERT Proposed SR 3.6.3.1 Note

a. At least once per 31 days by verifying that all penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves, secured in their positions, except for valves that are open under administrative control as permitted by Specification 3.6.3.1. are locked, sealed, or otherwise secured, or

L.5

L.6

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3.

<see ITS 3.6.1>

c. After each closing of the equipment hatch, by leak rate testing the equipment hatch seals, with gas at P_a, greater than or equal to 44.1 psig. Results shall be evaluated against the criteria of Specification 3.6.1.2.b as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995.

<see ITS 5.5.15>

d. Each time containment integrity is established after vacuum has been broken by pressure testing the butterfly isolation valves in the containment purge lines and the containment vacuum ejector line.

<see ITS 5.5.15>

SR 3.6.3.1

* Except valves, blind flanges, and deactivated automatic valves which are located inside the containment and are locked sealed or otherwise sealed in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except that such surveillance need not be performed more often than once per 92 days.

SR 3.6.3.2

INSERT Proposed SR 3.6.3.2 Note

L.5

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UNIT 2

A.1

ITS 3.6.3

ITS

3/4.6.3 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.3

3.6.3.1 Each containment isolation valve shall be OPERABLE.*

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

ACTION: Insert proposed Action Note 3 A.2

Insert proposed Action Note 4 A.3

Action NOTE 2 With one or more of the isolation valves inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and: A.8

a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or A.4

Action A.1 Action C.1 b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or

Action A.1 Action C.1 c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange; or 72 L.3

INSERT proposed Condition B A.5

Action D.1 Action D.2 d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The provisions of Specification 3.0.4 do not apply. A.6

SURVEILLANCE REQUIREMENTS Insert proposed ACTIONS A.2 and C.2 M.1

4.6.3.1.1 Each containment isolation valve shall be demonstrated OPERABLE:

a. At least once per 92 days by cycling each weight or spring loaded check valve testable during plant operation, through one complete cycle of full travel and verifying that each check valve remains closed when the differential pressure in the direction of flow is less than 1.2 psid and opens when the differential pressure in the direction of flow is greater than or equal to 1.2 psid but less than 5.0 psid. A.10

b. Prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of the applicable cycling test and verification of isolation time. L.1

Action Note 1 * Locked or sealed closed valves may be opened on an intermittent basis under administrative control.

except for 36 inch purge and exhaust valve, 18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction flowpaths. M.2

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ITS

SURVEILLANCE REQUIREMENTS (Continued)

4.6.3.1.2 Each containment isolation valve shall be demonstrated OPERABLE during the COLD SHUTDOWN or REFUELING MODE at least once per 18 months by: (L.1)

SR 3.6.3.4

a. Verifying that on a Phase A containment isolation test signal, each Phase A isolation valve actuates to its isolation position.

b. Verifying that on a Phase B containment isolation test signal, each Phase B isolation valve actuates to its isolation position.

c. Verifying that on a Containment Purge and Exhaust isolation signal, each Purge and Exhaust valve actuates to its isolation position. <See ITS 3.9.4>

SR 3.6.3.5 d. Cycling each weight or spring loaded check valve not testable during plant operation, through one complete cycle of full travel and verifying that each check valve remains closed when the differential pressure in the direction of flow is less than 1.2 psid and opens when the differential pressure in the direction of flow is greater than or equal to 1.2 psid but less than 5.0 psid.

SR 3.6.3.3 4.6.3.1.3 The isolation time of each power operated or automatic containment isolation valve shall be determined to be within its limit when tested pursuant to Specification 4.0.5.

in accordance with the Inservice Testing Program

(A.7)

isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured

L.4

ITS

CONTAINMENT SYSTEMS

3/4.6.5 SUBATMOSPHERIC PRESSURE CONTROL SYSTEM

STEAM JET AIR EJECTOR

LIMITING CONDITION FOR OPERATION

3.6.3 3.6.5.1 The inside and outside isolation valves in the steam jet air ejector suction line shall be closed.

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

Insert proposed Action Note 3 A.3

ACTION: Insert proposed Action Note 4 A.8

Action NOTE 2 Action A.1 With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position within 2 hour or be in HOT SHUTDOWN within the next 12 hours. L.2

4 5

Action D.1 Action D.2 MODE 3 within 6 hours and MODE 5 within 36 hours M.3

Insert proposed Action A.2 M.1

Insert proposed Condition B A.5

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1 4.6.5.1.1 The steam jet air ejector suction line outside isolation valve shall be determined to be in the closed position by a visual inspection prior to increasing the Reactor Coolant System temperature above 200°F and at least once per 31 days thereafter if the valve is not locked, sealed or otherwise secured in the closed position. LA.2 A.9

SR 3.6.3.2 4.6.5.1.2 The steam jet air ejector suction line inside isolation valve shall be determined to be in the closed position prior to increasing the Reactor Coolant System temperature above 200°F.

A.1

ITS 3.6.3

02-09-96

ITS

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 CONTAINMENT

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

<See ITS 3.6.1>

SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

<See ITS 3.6.1>

SR 3.6.3.1

INSERT Proposed SR 3.6.3.1 Note

a. At least once per 31 days by verifying that all penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves, secured in their positions, except for valves that are open under administrative control as permitted by Specification 3.6.3.1. locked, sealed, or otherwise secured, or

L.5

L.6

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3.

<See ITS 3.6.1>

c. After each closing of the equipment hatch, by leak rate testing the equipment hatch seals, with gas at P_a, greater than or equal to 44.1 psig. Results shall be evaluated against the criteria of Specification 3.6.1.2.b as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide 1.163, dated September 1995.

<See ITS 5.5.15>

d. Each time containment integrity is established after vacuum has been broken by pressure testing the butterfly isolation valves in the containment purge lines and the containment vacuum ejector line.

<See ITS 5.5.15>

SR 3.6.3.1

* Except valves, blind flanges and deactivated automatic valves which are located inside the containment and are locked sealed or otherwise sealed in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except that such surveillance need not be performed more often than once per 92 days.

SR 3.6.3.2

Insert proposed SR 3.6.3.2 Note

L.5

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A.2 CTS 3.6.3.1 and CTS 3.6.5.1 do not specifically require Conditions be entered for systems supported by containment isolation valves. OPERABILITY of supported systems is addressed through the definition of OPERABILITY for each system, and appropriate LCO Actions are taken. ITS 3.6.3 Action Note 3 states, "Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves." ITS 3.0.6 provides an exception to LCO 3.0.2, stating, "When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered." LCO 3.0.6 goes on to describe how the Safety Function Determination Program is used to evaluate support-supported system relationships. This changes CTS by requiring a specific statement to require supported system Conditions and Required Actions be entered, whereas in CTS this would be done without the NOTE.

This change is acceptable because the addition of the NOTE reflects the CTS requirement to take applicable Actions for inoperable systems. The NOTE is required because of the addition of LCO 3.0.6, and because the requirement to declare supported systems inoperable is being retained. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 CTS 3.6.3.1 and CTS 3.6.5.1 do not include a reference to entering applicable Conditions and Required Actions of the Containment OPERABILITY LCO (CTS 3.6.1.1). ITS 3.6.3 Action NOTE 4 states, "Enter applicable Conditions and Required Actions of LCO 3.6.1, "Containment," when leakage for a penetration flow path results in exceeding the overall containment leakage rate." This changes CTS by explicitly stating an existing requirement that the containment Actions be taken when the containment LCO is not met as a result of air lock leakage exceeding limits.

This change is acceptable because it reinforces the existing CTS requirement to meet overall containment leakage limits. This change is designated as administrative because it does not result in technical changes to the CTS.

A.4 CTS 3.6.3.1.a requires restoring the inoperable valve(s) to OPERABLE status within 4 hours with one or more of the isolation valves inoperable, or take one of the other

specified actions. ITS 3.6.3 does not state the requirement to restore an inoperable isolation valve to OPERABLE status, but includes other Actions to take within 4 hours. ITS LCO 3.0.2 states, "If the LCO is met or no longer applicable prior to the expiration of the specified Completion time(s), completion of the Required Actions(s) is not required unless otherwise stated." This changes CTS by including the requirement as part of LCO 3.0.2, rather than explicitly stating the allowance.

This change is acceptable because it retains an existing allowance in ITS format with ITS usage rules. This change is designated as administrative because it does not result in technical changes to the CTS.

A.5 CTS 3.6.3.1 and CTS 3.6.5.1 do not include any Condition and Required Actions for one or more penetration flow paths with two containment isolation valves inoperable. CTS 3.0.3 would be entered for this Condition. ITS 3.6.3 Condition B states, "One or more penetration flow paths with two containment isolation valves inoperable." ITS Required Action B.1 states, "Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange," within 1 hour. ITS 3.6.3 Condition D requires the unit be placed in MODE 3 in 6 hours, and MODE 5 in 36 hours if the Required Action and associated Completion Time is not met. This changes CTS by stating the Actions to be taken for two containment isolation valves inoperable, rather than relying on CTS 3.0.3, which contains the same Completion Times for placing the unit outside its MODE of Applicability.

This change is acceptable because it places CTS 3.0.3 requirements in ITS format. This change is designated as administrative because it does not result in technical changes to the CTS.

A.6 CTS 3.6.3.1 Action states, "The provisions of Specification 3.0.4 do not apply." CTS 3.0.4 states, "Entry into an OPERATIONAL MODE or other specified applicability condition shall not be made unless the conditions of the Limiting Condition for Operation are met without reliance on provision contained in the ACTION statements unless otherwise excepted." ITS 3.6.2 does not contain the exception to ITS 3.0.4. ITS 3.0.4 states, "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time." This changes CTS by incorporating an allowance into ITS LCO 3.0.4.

This change is considered acceptable because LCO 3.0.4 is changed in ITS such that the NOTE is not required to retain the same CTS requirement. ITS 3.6.2 Actions allow continued operation for an unlimited period of time, which together with ITS 3.0.4 result in the same technical requirements as the CTS. This change is designated as administrative because it does not result in technical changes to the CTS.

A.7 CTS 4.6.3.1.3 requires the isolation time of each power operated or automatic containment isolation valve be determined to be within its limit when tested pursuant to Specification 4.0.5. ITS SR 3.6.3.3 requires verifying the isolation time of each automatic power operated containment isolation valve is within limits, with a Frequency in accordance with the Inservice Testing Program. This changes the CTS by stating that the Frequency is in accordance with the Inservice Testing Program.

The purpose of CTS 4.6.3.1.3 is to verify the isolation time of each power operated or automatic containment isolation valve is tested in accordance with the Inservice Testing Program. This change is acceptable because the test requirements regarding the power operated or automatic containment isolation valves remain the same. The ITS SR 3.6.3.3 Frequency remains unchanged. The inservice testing requirements of CTS 4.0.5 have been relocated to the Inservice Testing Program contained in Section 5.5 of the ITS. This change is designated as administrative because it does not result in technical changes to the CTS.

A.8 CTS 3.6.3.1 Action states, "With one or more of the isolation valves inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open..." CTS 3.6.5.1 Action states, "With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position..." ITS 3.6.3 Actions NOTE 2 states, "Separate Condition entry is allowed for each penetration flow path." This changes CTS by stating an existing allowance in ITS format.

The purpose of CTS 3.6.3.1 Action is to provide guidance on how to address isolation valve inoperabilities for individual penetrations. CTS 3.6.5.1 addresses a specific penetration. ITS 3.6.3 Actions NOTE 2 provides similar guidance in ITS format, using ITS usage rules. This change is designated as administrative because it does not result in technical changes to the CTS.

A.9 CTS 4.6.5.1.1 states, "The steam jet air ejector suction line outside isolation valve shall be determined to be in the closed position by visual observation prior to increasing the Reactor Coolant System temperature above 200°F and..." ITS SR 3.6.5.1 does not include a reference to verification prior to increasing the Reactor Coolant System temperature above 200°F. ITS SR 3.0.1 states, " SRs shall be met during the MODES or other specified conditions in the Applicability for individual LCOs..." This changes CTS by not including a statement for a requirement that is already addressed in the ITS 3.0 Section.

This change is acceptable because it incorporates a CTS requirement into the general rules for use of the ITS in the 3.0 section. This change is designated as administrative because it does not result in technical changes to the CTS.

A.10 CTS 4.6.3.1.1.a requires testing of each containment isolation valve that is a weight or spring loaded check valve testable during unit operation every 92 days. The ITS does not contain this Surveillance. This changes the CTS by eliminating this Surveillance.

This change is acceptable because the technical requirements have not changed. North Anna does not contain any containment isolation valves that are weight or spring loaded check valves which are testable during unit operation. Therefore, this surveillance is never performed. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M.1 CTS 3.6.3.1 and CTS 3.6.5.1 do not contain a requirement to periodically verify an affected penetration flow path is isolated after it is isolated due to one inoperable containment isolation valve. ITS 3.6.3 Required Action A.2 requires the affected penetration flow path be verified 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. ITS 3.6.3, Required Action C.2, requires the affected penetration flow path to be verified isolated every 31 days. ITS 3.6.3 Required Actions A.2 and C.2 include two NOTES. These NOTES allow isolation devices in high radiation areas and isolation devices that are locked, sealed, or otherwise secured to be verified by administrative means. This changes CTS by a adding new Required Actions to the Actions.

The purpose of CTS 3.6.3.1 Actions is to ensure that containment penetrations required to be isolated following an accident, but are no longer capable of being automatically isolated, are isolated in case an event occurs. This change is acceptable because the added Required Action provides additional assurance that the flow paths required to be isolated are isolated. This change is considered more restrictive because a new Required Action is added.

M.2 CTS 3.6.3.1 footnote "*" states, "Locked or sealed closed valves may be opened on an intermittent basis under administrative control." ITS 3.6.3 Action Note 1 states, " Penetration flow paths, except for 36 inch purge and exhaust valve, 18 inch containment vacuum breaking valve, 8 inch purge bypass valve, and steam jet air ejector suction flow paths, may be unisolated on an intermittent basis under administrative control." This changes CTS by not allowing the valves in the specified flow paths to be included as containment isolation valves allowed to be opened intermittently under administrative control.

The purpose of CTS 3.6.3.1 footnote "*" is to allow the opening of those valves that are normally locked or sealed closed valves for maintenance or testing purpose during power operations. This change is acceptable because opening of valves in the specified flow paths potentially exposes a large containment opening, and

maintenance is not performed on these valves in MODES 1, 2, 3, and 4. This change is designated more restrictive because it removes an allowance in the CTS.

M.3 CTS 3.6.5.1 Action states, "With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position within 1 hour or be in HOT SHUTDOWN within the next 12 hours." ITS 3.6.3 requires that with the Required Action and associated Completion Time for containment isolation valves not met, the unit be in MODE 3 in 6 hours, and MODE 5 in 36 hours. This changes CTS by requiring the unit be in MODE 3 in 6 hours, and MODE 5 in 36 hours, instead of only HOT SHUTDOWN (MODE 4) in 12 hours.

The purpose of CTS 3.6.5.1 Action is to place the unit in a safer condition, HOT SHUTDOWN, when only one inside or outside isolation valve in the steam jet air ejector suction line is OPERABLE. This change is acceptable because it places the unit outside the MODE of Applicability, which is a better condition for this case, and is consistent with ISTS Actions for similar cases. This change is designated more restrictive because it requires additional Actions for an inoperable inside or outside isolation valve in the steam jet air ejector suction line.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.3.1.2 states, "Each containment isolation valve shall be demonstrated OPERABLE during COLD SHUTDOWN or REFUELING MODE at least once per 18 months..." by means that include actuation of specified automatic valves and cycling of weight or spring loaded check valves not testable during unit operation. ITS Frequency of SR 3.6.3.5 and SR 3.6.3.6 is 18 months, and does not include the phrase, "...during COLD SHUTDOWN and REFUELING MODE..." This changes the CTS by moving the reference to the 18 month Frequency being based on the need to perform this Surveillance under the conditions that apply during a unit outage to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement to test appropriate automatic valve actuation and check valve cycling on an 18 month Frequency. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled

by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.2 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.5.1.1 states, "The steam jet air ejector suction line outside isolation valve shall be determined to be in the closed position by visual observation..." ITS SR 3.6.3.1 does not include the reference to visual inspection. This changes the CTS by moving the detail of how the verification is performed to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to perform the verification that the valves are closed. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.6.3.1.1.b describes tests that must be performed prior to returning a valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit. The ITS does not include these testing requirements.

The purpose of CTS 4.6.3.1.1.b is to verify OPERABILITY of containment isolation valves following their maintenance, repair or replacement. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. Any time the OPERABILITY of a system or component has been affected by repair, maintenance, modification, or replacement of a component, post maintenance testing is required to demonstrate the OPERABILITY of the system or component. This is described in the Bases for ITS SR 3.0.1 and required under SR 3.0.1. The OPERABILITY requirements for the containment isolation valves are described in the Bases for Specification 3.6.3. In addition, the requirements of 10 CFR 50,

Appendix B, Section XI (Test Control) provide adequate controls for test programs to ensure that testing incorporates applicable acceptance criteria. Compliance with 10 CFR 50, Appendix B is required under the unit operating license. As a result, post-maintenance testing will continue to be performed and an explicit requirement in the Technical Specifications is not necessary. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.2 *(Category 3 – Relaxation of Completion Time)* CTS 3.6.5.1 Action states, "With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position within 1 hour..." ITS 3.6.3 Action A.1 requires that with one or more penetration flow paths with one containment isolation valve inoperable, the affected isolation flow path be isolated by one of the specified methods within 4 hours. This changes CTS by increasing the time within which to take the Required Action from 1 hour to 4 hours.

The purpose of CTS 3.6.5.1 Action is to provide assurance that the affected penetration flow path is isolated. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. ITS 3.6.3 Action A.1 still requires actions to ensure that the penetration flow path is isolated within a reasonable time frame. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.3 *(Category 3 – Relaxation of Completion Time)* CTS 3.6.3.1 states, "With one or more of the (containment) isolation valves inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and: isolate each affected penetration within 4 hours" by one of the means specified. ITS 3.6.3 Condition C includes a Note stating that Condition C only applies to penetration flow paths with only one containment isolation valve and a closed system. Action C.1 requires that with one or more penetration flow paths with one containment isolation valve inoperable, the penetration flow path be isolated by one of the means specified within 72 hours. This changes the CTS by extending the Completion Time from 4 hours to 72 hours when the inoperable valve is used in conjunction with a closed system.

The purpose of ITS 3.6.3 Required Action C.1 is to provide a degree of assurance that the penetration flow path with an inoperable isolation valve maintains the containment penetration isolation boundary. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. In the case of a penetration with an inoperable valve

and a closed system, 72 hours is a reasonable time period considering the relative stability of a closed system to act as a penetration isolation boundary. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.4 *(Category 4 – Relaxation of Required Action)* CTS 3.6.5.1 Action states, "With the inside or outside isolation valve in the steam jet air ejector suction line not closed, restore the valve to the closed position..." ITS 3.6.3 Action A.1 requires that with one or more penetration flow paths with one containment isolation valve inoperable, the affected isolation flow path be isolated by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. This changes CTS by only requiring the flow path be isolated by one of the specified methods, rather than requiring both valves be closed.

The purpose of CTS 3.6.5.1 Action is to provide assurance that the affected penetration flow path is isolated. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. This change requires that the flow path be isolated by one of the specified methods, rather than specifying both inside and outside isolation valves in the steam jet air ejector suction line be closed. The flow path is still required to be isolated in a manner similar to that specified for other containment isolation valves. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.5 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.1.1.a requires verification that specified containment penetrations are closed. ITS SR 3.6.3.1 and ITS SR 3.6.3.2 include similar requirements, but contain a Note that allows valves and blind flanges in high radiation areas to be verified administratively. This changes the CTS by allowing certain valves and blind flanges to not require physical verification.

The purpose of ITS SR 3.6.3.1 and SR 3.6.3.2 is to provide assurance that containment penetrations are closed when necessary. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. The position of containment isolation valves and blind flanges in high radiation areas that are required to be closed can be verified administratively, not requiring physical verification. Access to high radiation areas is limited, making access to the valves and blind flanges more difficult, and

mispositioning less likely. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.6 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.1.1 states, "Primary CONTAINMENT INTEGRITY shall be demonstrated: a. At least once per 31 days by verifying that all penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves, secured in their positions except for valves that are open under administrative control as permitted by Specification 3.6.3.1." The "*" refers to exceptions for valves inside containment and provides a different Frequency. ITS SR 3.6.3.1 states, "Verify each 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," every 31 days. SR 3.6.3.2 has similar controls for valves inside containment, but a different Frequency. This changes the CTS by adding the phrase, "and not locked, sealed or otherwise secured," providing additional flexibility regarding how the valves are secured in position.

The purpose of CTS 4.6.1.1 is to provide assurance that valves required to be closed are closed. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Valves are verified in position prior to being locked, sealed, or otherwise secured, and are not expected to change position because other controls are placed on them by the means of securing their position. Such an allowance is already provided in CTS 4.6.1.1.a "*" and ITS SR 3.6.3.2, not requiring valves inside containment be verified closed every 31 days, one reason for which is that access to containment is under strict access control. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

UNIT 1

ITS

CONTAINMENT SYSTEMS

INTERNAL PRESSURE

LIMITING CONDITION FOR OPERATION

3.6.4

3.6.1.4 Primary containment internal air partial pressure shall be maintained > 9.0 psia and within the acceptable operation region on Figure 3.6-1.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A.1

Action B.1

Action B.2

With the containment internal air partial pressure < 9.0 psia or above the applicable limit shown on Figure 3.6-1, restore the internal air partial pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

4.6.1.4 The primary containment internal air partial pressure shall be determined to be within the limits at least once per 12 hours.

ITS

Figure 3.6.4-1

A.1

ITS 3.6.4

12-14-88

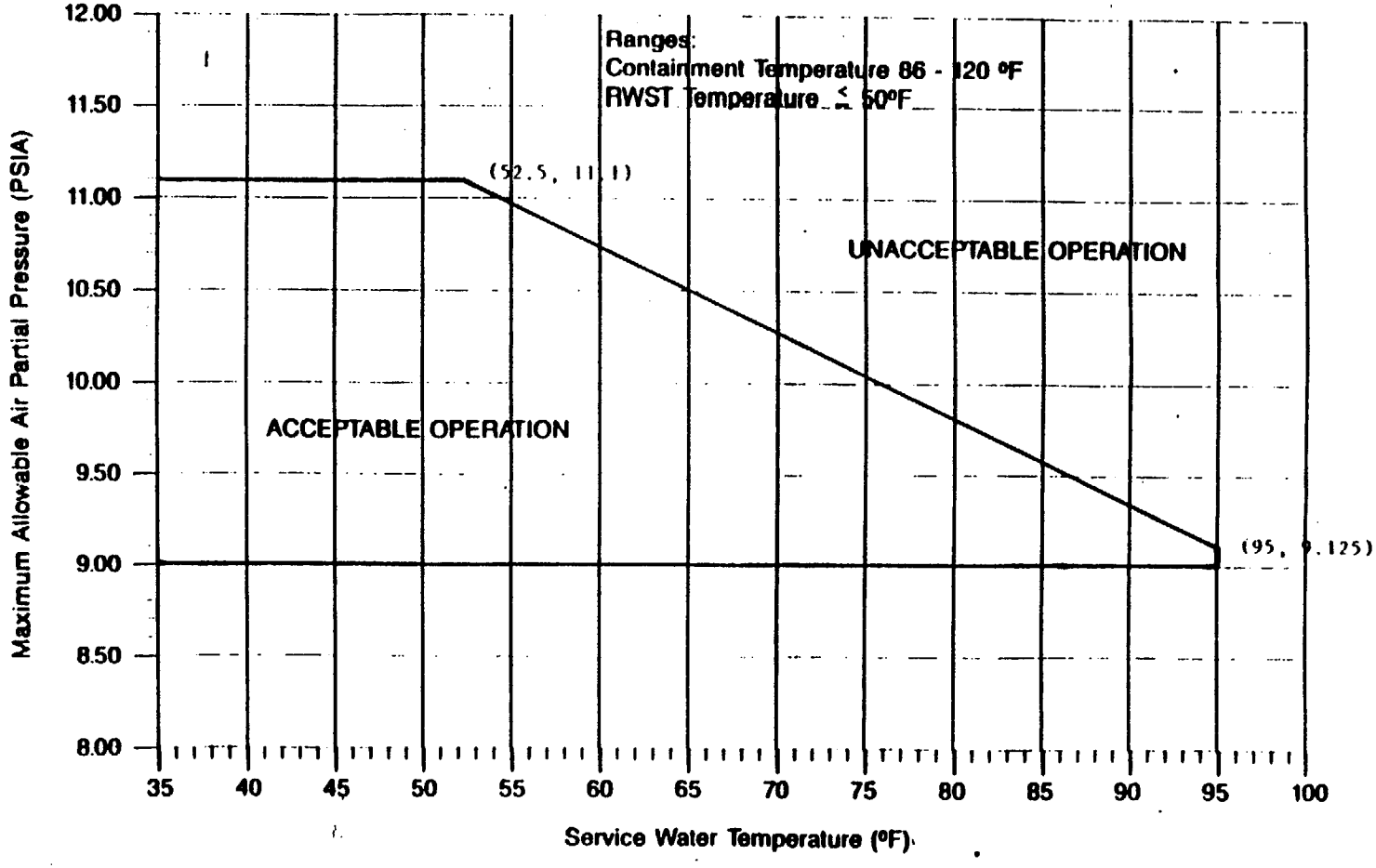

Figure 3.6-1 Containment Air Partial Pressure Versus Service Water Temperature

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UNIT 2

CONTAINMENT SYSTEMS

ITS

INTERNAL PRESSURE

LIMITING CONDITION FOR OPERATION

3.6.4 3.6.1.4 Primary containment internal air partial pressure shall be maintained greater than or equal to 9.0 psia and within the acceptable operation on Figure 3.6-1.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A.1 With the containment internal air partial pressure less than 9.0 psia or above the applicable limit shown on Figure 3.6-1, restore the internal air partial pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Action B.1
Action B.2

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1 4.6.1.4 The primary containment internal air partial pressure shall be determined to be within the limits at least once per 12 hours.

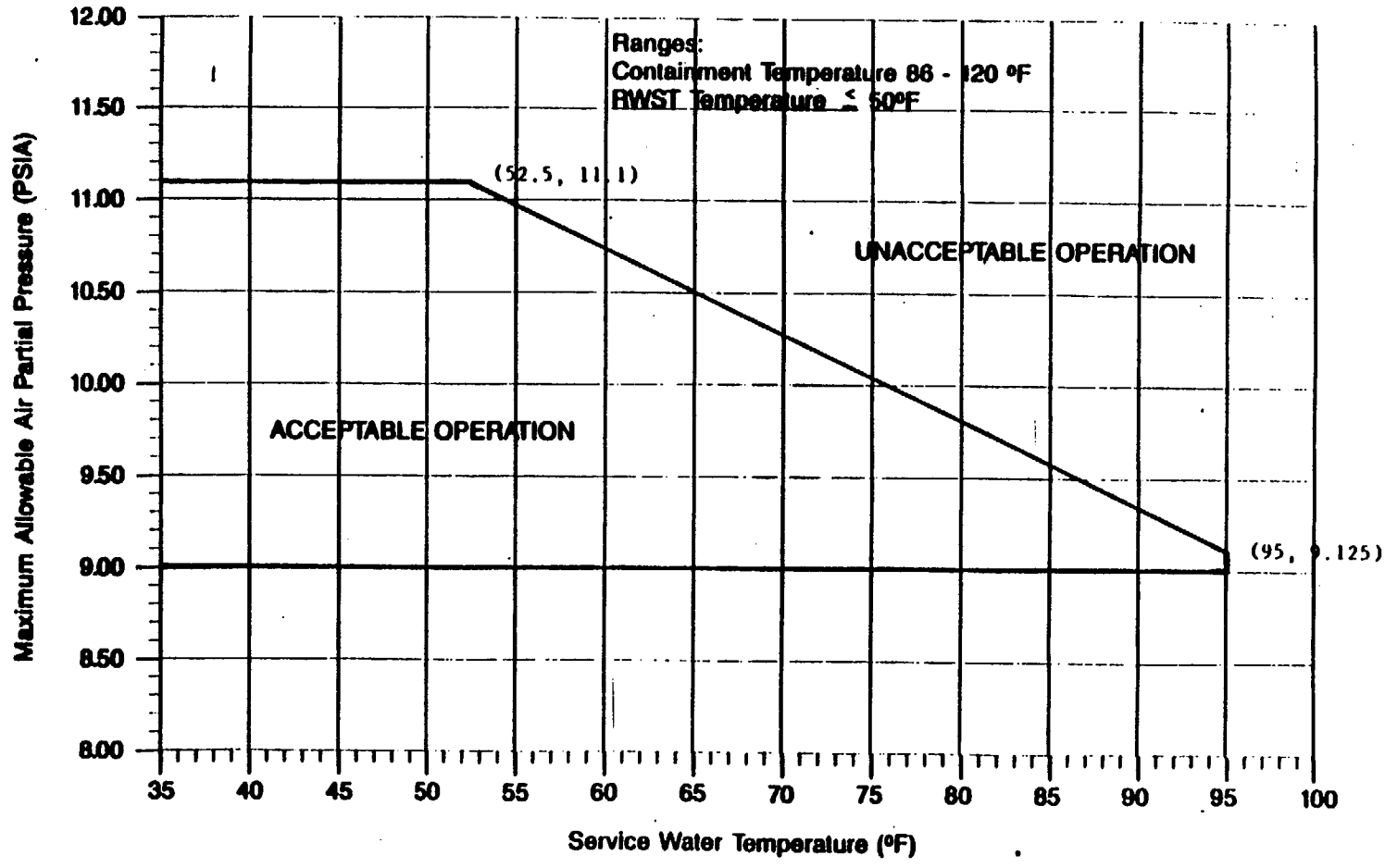

Figure 3.6-1 Containment Air Partial Pressure Versus Service Water Temperature

A.1

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

MORE RESTRICTIVE CHANGES

None.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

UNIT 1

A.1

12-14-88

ITS

CONTAINMENT SYSTEMS

AIR TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.6.5

3.6.1.5 Primary containment average air temperature shall be maintained ≥ 86°F and ≤ 120°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A.1
Action B.1
Action B.2

With the containment average air temperature > 120°F or < 86°F, restore the average air temperature to within the limit within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

4.6.1.5.1 The primary containment average air temperature shall be within limits the weighted average of at least the minimum number of temperatures at the following locations and shall be determined at least once per 24 hours: LA.1

Location			Weight Factor(WF)	Min. No. of Temperature
a.	Containment dome	Elev. ~ 390	0.09604	1
b.	Inside crane wall	Elev. ~ 329	0.04846	2
c.	Annulus	Elev. ~ 329	0.02256	2
d.	Annulus	Elev. ~ 238	0.04972	1
e.	Cubicles	Elev. ~ 268	0.06785 (.07513)*	2

LA.1

4.6.1.5.2 The average containment air temperature shall be determined by the following relationship:

$$T_{containment} = \frac{1.0}{\left[\sum_{i=1}^{n} \frac{WF_i}{T_i}\right]} \text{ where}$$

WF_i is the weight factor for the temperature T_i, of the ith temperature measurement.

*Weight factor to be used for pressurizer cubicle at Elev. 268.

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UNIT 2

CONTAINMENT SYSTEMS

ITS

AIR TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.6.5

3.6.1.5 Primary containment average air temperature shall be maintained greater than or equal to 86°F and less than or equal to 120°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A.1
Action B.1
Action B.2

With the containment average air temperature greater than 120°F or less than 86°F, restore the average air temperature to within the limit within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

(within limits)

4.6.1.5.1 The primary containment average air temperature shall be the weighted average of at least the minimum number of temperatures at the following locations and shall be determined at least once per 24 hours:

LA.1

LA.1

Location			Weight Factor(WF)	Min. No. of Temperature Detectors
a.	Containment dome	Elev. ~ 390	0.04789	1
b.	Inside crane wall	Elev. ~ 329	0.09373	2
c.	Annulus	Elev. ~ 329	0.02283 (0.02935)*	2
d.	Annulus	Elev. ~ 238	0.08309	1
e.	Cubicles	Elev. ~ 268	**	1

4.6.1.5.2 The average containment air temperature shall be determined by the following relationship:

$$T_{containment} = \frac{1.0}{\sum_{i=1}^{n} \frac{WF_i}{T_i}}$$ where

WF_i is the weight factor for the temperature T_i, of the ith temperature measurement.

* Weight factor to be used for pressurizer cubicle at Elev. 268.

**Weight factor to be used for cubicles A=0.03932, B=0.03597., C=0.03619

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.1.5.1 includes specific locations where containment temperatures are to be measured and describes how the temperature used for the LCO is calculated. ITS SR 3.6.5.1 does not include these details. This changes the CTS by moving the description of how compliance with the Technical Specification LCO is determined to the UFSAR.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to maintain temperature within the specified range and the same surveillance Frequency. Also, this change is acceptable because these types of procedural details will be adequately controlled in the UFSAR. The UFSAR is controlled under 10 CFR 50.59 which ensures changes are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

None

UNIT 1

A.1

ITS 3.6.6

11-26-77

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

ITS

CONTAINMENT QUENCH SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.6

3.6.2.1 Two ~~independent~~ containment quench spray subsystems shall be OPERABLE. LA.1

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A

Action B

With one containment quench spray subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment quench spray subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days by:

SR 3.6.6.1

1. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position. (See ITS 3.5.4)

2. Verifying the temperature of the borated water in the refueling water storage tank is within the limits shown on Figure 3.6-1. LA.5

SR 3.6.6.2

b. Verifying ~~that on recirculation flow~~ each pump develops a discharge ~~pressure of~~ ≥ ~~135 psig~~ head when tested pursuant to Specification 4.0.5. LA.2

the required developed head at the flow test point

c. At least once per 18 months during shutdown, by:

SR 3.6.6.3

1. Verifying that each automatic valve in the flow path actuates to its correct position on ~~a containment high-high~~ signal. LA.3

SR 3.6.6.4

2. Verifying that each spray pump starts automatically on ~~a containment high-high~~ signal. LA.3

an actual or simulated actuation L.2

That is not locked, sealed, or otherwise secured in position L.1

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SURVEILLANCE REQUIREMENTS (Continued)

SR 3.6.6.5 d. At least once per 10 years by ~~performing an air or smoke flow test through each spray header and~~ verifying each spray nozzle is unobstructed. | LA.4

UNIT 2

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

ITS

CONTAINMENT QUENCH SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.6 3.6.2.1 Two ~~independent~~ containment quench spray subsystems shall be OPERABLE. LA.1

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A / Action B With one containment quench spray subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment quench spray subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days by:

SR 3.6.6.1

1. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

2. Verifying the temperature of the borated water in the refueling water storage tank is within the limits shown on Figure 3.6-1. (See ITS 3.5.4)

SR 3.6.6.2

b. Verifying ~~that on recirculation flow,~~ each pump develops a discharge ~~pressure~~ head of greater than or equal to ~~123 psig~~ the required developed head at the flow test point when tested pursuant to Specification 4.0.5. LA.5 LA.2

c. At least once per 18 months during shutdown, by: LA.3

SR 3.6.6.3

1. Verifying that each automatic valve in the flow path actuated to its correct position on ~~a Containment Pressure – high-high~~ an actual or simulated actuation signal.

SR 3.6.6.4

2. Verifying that each spray pump starts automatically on ~~a Containment Pressure – high-high~~ an actual or simulated actuation signal. L.2

SR 3.6.6.5

d. At least once per 10 years by ~~performing an air or smoke flow test through each spray header and~~ verifying each spray nozzle is unobstructed. LA.3 LA.4

that is not locked, sealed, or otherwise secured in position L.1

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS LCO 3.6.2.1 states that two independent containment quench spray subsystems shall be OPERABLE. ITS 3.6.6 also requires two quench spray trains (i.e., subsystems) to be OPERABLE. This changes the CTS by moving the detail that the trains must be independent to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that two containment Quench Spray subsystems shall be OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA.2 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS SR 4.6.2.1.b states, "Verifying that on recirculation flow, each pump develops a discharge pressure of ≥ 123 psig when tested pursuant to

Specification 4.0.5." ITS SR 3.6.6.2 states, "Verify each QS pump's developed head at the flow test point is greater than or equal to the required developed head." This changes the CTS by moving the required developed head limit from the Technical Specifications to the Inservice Test Program. The change to the description of the test being performed using recirculation flow is discussed in LA.5.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify each QS pump's developed head at the flow test point is greater than or equal to the required developed head under the Inservice Test Program. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ISI/IST Program. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.3 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillances 4.6.2.1.c.1 and 4.6.2.1.c.2 require verification of the automatic actuation of QS components on a containment high-high pressure signal. ITS SR 3.6.6.3 and SR 3.6.6.4 do not specify the name of the signal, but only specify an actuation signal. This changes the CTS by moving the type of actuation signal to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that appropriate QS pumps and valves start or actuate on an actuation signal. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.4 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance 4.6.2.1.d states, "At least once per 10 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed." ITS SR 3.6.6.5 states, "Verify each spray nozzle is unobstructed." This changes the CTS by moving the details of the test to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not

necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that spray nozzles are verified unobstructed. Also, this change is acceptable because these types of procedural details will be adequately controlled the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.5 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS SR 4.6.2.1.b states, "Verifying that on recirculation flow, each pump develops a discharge pressure of ≥ 123 psig when tested pursuant to Specification 4.0.5." ITS SR 3.6.6.2 states, "Verify each QS pump's developed head at the flow test point is greater than or equal to the required developed head." This changes the CTS by moving the description that the test is performed using recirculation flow to the Bases of the Surveillance. The change moving the required developed head limit from the Technical Specifications is discussed in LA.2.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify each QS pump's developed head at the flow test point is greater than or equal to the required developed head. Also, this change is acceptable because these types of procedural details will be adequately controlled the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS Surveillance 4.6.2.1.c.1 requires verification that each automatic valve in the flow path actuates to its correct position on a containment - high-high pressure signal. ITS SR 3.6.6.3 requires verification that each automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to its correct position on an actual or simulated actuation signal. This changes the CTS by excluding those valves that are locked, sealed, or otherwise secured in position from this test. Removal of the containment - high-high pressure signal reference and addition of the actual or

simulated actuation signal reference are addressed by Removed Detail and Less Restrictive changes respectively.

The purpose of CTS 4.6.2.1.c.1 is to ensure that the Quench Spray valves which are required to actuate and which receive an actuation signal actuate to their correct position. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Those automatic valves that are locked, sealed, or otherwise secured in position are not required to actuate on a containment - high-high pressure signal in order to perform their safety function because they are already in the required position. Testing such valves would not provide any additional assurance of OPERABILITY. Valves that are required to actuate will continue to be tested. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.2 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS Surveillances 4.6.2.1.c.1 and 4.6.2.1.c.2 require verification of the automatic actuation of QS components on a containment high-high pressure signal. ITS SR 3.6.6.3 and SR 3.6.6.4 specify that the testing may be performed with an actual or simulated actuation signal. This changes the CTS by explicitly allowing the use of either an actual or simulated signal for the test. The change from "containment high-high signal" to "actuation signal" is discussed in LA.3.

The purpose of CTS 4.6.2.1.c.1 is to ensure that the Quench Spray valves which are required to actuate and which receive an actuation signal actuate to their correct position. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Equipment can not discriminate between an "actual" or "simulated" signal and, therefore, the results of the testing are unaffected by the type of signal used to initiate the test. This change allows taking credit for unplanned actuations if sufficient information is collected to satisfy the surveillance test requirements. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

UNIT 1

A.1

CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SPRAY SYSTEM

ITS

LIMITING CONDITION FOR OPERATION

Four subsystems

A.2

LCO 3.6.7

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of:

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

LA.1

b. One casing cooling tank (shared with both trains) shall be OPERABLE with:

LA.2

SR 3.6.7.2 1. Contained borated water volume of at least 116,500 gallons.

SR 3.6.7.3 2. Between 2300 and 2400 ppm boron concentration.

SR 3.6.7.1 3. A solution temperature ≥ 35°F and ≤ 50° F.

Verify

A.3

Applicability

APPLICABILITY: Modes 1, 2, 3 and 4

ACTION:

Action A, Action E

a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

Actions B,C, Action E

b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Insert 1

L.1

Action D, Action E

c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Insert 2

L.2

Insert proposed Action F

A.4

INSERT 1

or two inside RS subsystems inoperable,

INSERT 2

; restore at least one inoperable subsystem to OPERABLE status within the next 48 hours or be

ITS

CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SPRAY SYSTEM

SURVEILLANCE REQUIREMENTS

4.6.2.2.1 Each containment recirculation spray subsystem and casing cooling subsystem shall be demonstrated OPERABLE:

SR 3.6.7.4 a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

SR 3.6.7.5 b. Verify each RS and casing cooling pump's developed head at the flow test point is greater than or equal to the required developed head. The frequency shall be in accordance with the Inservice Testing Program.

c. At least once per 18 months by:

SR 3.6.7.6 1. Verifying that on a ~~Containment Pressure High-High~~ signal each casing cooling pump starts automatically ~~without time delay~~ and each recirculation spray pump starts automatically with the following ~~time delays:~~ inside ~~195~~ ± 9.75 seconds, outside 210 ± 21 seconds. (L.3) (LA.4) (LA.3)

an actual or simulated actuation signal

Insert

SR 3.6.7.7 2. Verifying that each automatic valve in the flow path actuates to its correct position on a ~~containment pressure high-high~~ test signal. (L.4) (L.3) (LA.4)

d. At least once per 10 years by ~~performing~~ an air ~~or smoke flow test~~ through ~~each spray header and~~ verifying each spray nozzle is unobstructed. (LA.5)

4.6.2.2.2 The casing coolant tank shall be demonstrated OPERABLE:

SR 3.6.7.2 a. At least once per 7 days by:

1. Verifying the contained borated water volume in the tank, and is ≥ 116,500 gallons (A.3)

SR 3.6.7.3 2. Verifying the boron concentration of the water. is ≥ 2300 ppm and ≤ 2400 ppm (A.3)

SR 3.6.7.1 b. At least once per 24 hours by verifying the casing cooling tank temperature. is ≥ 35°F and ≤ 50°F (A.3)

INSERT

that is not locked, sealed, or otherwise secured in position,

UNIT 2

A.1

Four subsystems

CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SPRAY SYSTEM

ITS

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two trains of containment recirculation spray shall be OPERABLE. Each train shall consist of: A.2

3.6.7

a. 1. One inside containment recirculation spray subsystem composed of an inside containment recirculation spray pump, associated heat exchanger and flow path, and LA.1

2. One outside containment recirculation spray subsystem composed of an outside containment recirculation spray pump, associated heat exchanger and flow path, and a casing cooling pump and a flow path capable of transferring fluid from the casing cooling tank to the suction of the outside recirculation spray pump.

b. One casing cooling tank (shared with both trains) shall be OPERABLE with: LA.2

SR 3.6.7.2 1. Contained borated water volume of at least 116,500 gallons.

SR 3.6.7.3 verify 2. Between 2300 and 2400 ppm boron concentration. A.3

SR 3.6.7.1 3. A solution temperature ≥ 35°F and ≤ 50° F.

APPLICABILITY: Modes 1, 2, 3 and 4

ACTION:

Action A, Action E — a. With one containment recirculation spray subsystem inoperable in one containment recirculation spray train, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours; restore the inoperable subsystem to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours.

Actions B, C, Action E — b. With two containment recirculation spray subsystems inoperable in one containment recirculation spray train, restore one inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Insert 1 L.1

Action D, Action E — c. With the casing cooling tank inoperable, restore the tank to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Insert 2 L.2

Action F (Add proposed Action F) A.4

SURVEILLANCE REQUIREMENTS

4.6.2.2.1 Each containment recirculation spray subsystem and casing cooling subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position. SR 3.6.7.4

INSERT 1

or two inside RS subsystems inoperable,

INSERT 2

; restore at least one inoperable subsystem to OPERABLE status within the next 48 hours or be

A.1

ITS 3.6.7

ITS

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CONTAINMENT SYSTEMS

CONTAINMENT RECIRCULATION SPRAY SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.6.7.5

b. Verify each RS and casing cooling pump's developed head at the flow test point is greater than or equal to the required developed head. The frequency shall be in accordance with the Inservice Testing Program.

c. At least once per 18 months by:

SR 3.6.7.6

an actual or simulated actuation signal

1. Verifying that on a ~~Containment Pressure–High-High signal~~ each casing cooling pump starts automatically ~~without time delay~~ and each recirculation spray pump starts automatically ~~with the following time delays: inside 195 ± 9.75 seconds, outside 210 ± 21 seconds~~ LA.4 L.3 LA.3 L.4

Insert

2. Verifying that each automatic valve in the flow path actuates to its correct position on a ~~Containment Pressure – high-high test signal~~ LA.4 L.3

d. At least once per 10 years ~~by performing an air or smoke flow test through each spray header and~~ verifying each spray nozzle is unobstructed. LA.5

4.6.2.2.2 The casing coolant tank shall be demonstrated OPERABLE:

SR 3.6.7.2
SR 3.6.7.3
SR 3.6.7.1

a. At least once per 7 days by:

1. Verifying the contained borated water volume in the tank is ≥ 116,500 gallons, and
2. Verifying the boron concentration of the water is ≥ 2300 ppm and ≤ 2400 ppm

b. At least once per 24 hours by verifying the casing cooling tank temperature is ≥ 35°F and ≤ 50°F

A.3

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INSERT

that is not locked, sealed, or otherwise secured in position,

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A.2 CTS 3.6.2.2 states two trains of containment recirculation spray shall be OPERABLE. ITS 3.6.7 states four Recirculation Spray (RS) subsystems shall be OPERABLE. This changes the CTS by specifying that the four subsystems that make up the two RS trains be OPERABLE.

The purpose of CTS 3.6.2.2 is to have the required equipment available for two RS trains to be OPERABLE. This change is acceptable because a train of RS is made up of two subsystems, so requiring the four RS subsystems to be OPERABLE is equal to requiring two RS trains to be OPERABLE. This change is designated as administrative because it does not result in technical changes to the CTS.

A.3 CTS LCO 3.6.2.2.b states the casing cooling tank solution requirements that must be met for the casing cooling tank to be OPERABLE. ITS LCO 3.6.7 requires the casing cooling tank to be OPERABLE, but the specific solution requirements are moved to the Surveillance Requirements (SRs). This changes the CTS by moving specific parameter requirements that must be met for OPERABILITY from the LCO to the SRs.

The purpose of CTS 3.6.2.2.b is to have the casing cooling tank OPERABLE with the solution parameters within the required limits. This change is acceptable because ITS SR 3.0.1 states that failure to meet a SR is failure to meet the LCO. The movement of this information from the LCO to the SR results in no change to the OPERABILITY requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

A.4 CTS 3.6.2.2 does not contain an ACTION for one inside RS subsystem and one outside RS subsystem inoperable not in the same train, or for two outside RS subsystems inoperable, or for three or more RS subsystems inoperable. In these conditions CTS 3.0.1 would be entered. ITS 3.6.7 CONDITION G includes a REQUIRED ACTION to enter ITS 3.0.3 for these conditions.

CTS 3.6.2.2 implicitly requires enter into CTS 3.0.3 for one inside RS subsystem and one outside RS subsystem inoperable not in the same train, or for two outside RS subsystems inoperable, or for three or more RS subsystems inoperable, by omitting

ACTIONS for these conditions. This change is acceptable because it provides explicit direction to enter LCO 3.0.3 instead of relying on the Section 3.0 usage rules to imply LCO 3.0.3 entry. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.2.2 states that two trains of containment RS shall be OPERABLE and contains a description of subsystems that each train consists of. ITS 3.6.7 states that four RS subsystems shall be OPERABLE, but the details of what constitutes an OPERABLE subsystem are moved to the Bases. This changes the CTS by moving the details of what constitutes a subsystem to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to have four RS subsystems OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA.2 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS LCO 3.6.2.2.b states that one casing cooling tank shared with both trains of RS shall be OPERABLE. ITS 3.6.7 states a casing cooling tank shall be OPERABLE, but the details regarding both trains sharing the tank are moved to the Bases. This changes the CTS by moving the detail that that a casing cooling tank is shared by both trains of RS to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement for one OPERABLE casing cooling tank. Also, this change is acceptable because the removed information will

be adequately controlled in the ITS Bases. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA.3 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.2.2.1.c.1 requires each containment RS subsystem and casing cooling subsystem be demonstrated OPERABLE by verifying that the casing cooling pump, and inside and outside RS pumps start automatically after a specified time delay. ITS SR 3.6.7.6 requires verification that the RS System pumps start automatically on an actuation signal, and does not contain the specific delay times. This changes CTS 4.6.2.2.1.c.1 by moving the specific delay times to the Bases.

The removal of these details for surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify the pumps start automatically on an actuation signal. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.4 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.2.2.1.c.1 and 4.6.2.2.1.c.2 require verification of the automatic actuation of RS components on a containment high-high pressure signal. ITS SR 3.6.7 does not specify the signal, but only specifies an actuation signal. This changes CTS by moving the designated actuation signal to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify that appropriate equipment actuates upon receipt of an actuation signal. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA.5 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.2.2.1.d requires each containment RS subsystem and casing cooling subsystem be demonstrated OPERABLE, "At least once per 10 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed." ITS SR 3.6.7.7 states, "Verify each spray nozzle is unobstructed." This changes the CTS by moving the details regarding the test method to the Bases.

The removal of these details for surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify each spray nozzle is unobstructed. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 4 – Relaxation of Required Action)* CTS 3.6.2.2 ACTION b states that with two containment RS subsystems inoperable in one RS train, restore one inoperable subsystem to OPERABLE status within 72 hours. ITS 3.6.7 Condition C addresses two inside RS subsystems inoperable, allowing a COMPLETION TIME of 72 hours. This changes the CTS by allowing 72 to hours to restore one RS subsystem to OPERABLE status when two inside RS subsystems are inoperable instead of entering LCO 3.0.3.

The purpose of CTS 3.6.2.2, ACTION b, is to provide a limited period of time to restore the RS system to OPERABLE status. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. The 72 hour COMPLETION TIME is considered appropriate given that 100% of the heat removal capacity and 360° containment spray coverage remains with both inside spray systems inoperable. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.2 *(Category 3 – Relaxation of Completion Time)* CTS 3.6.2.2, ACTION b states that with two RS subsystems inoperable in one RS train, one inoperable subsystem must be restored to OPERABLE status within 72 hours, or the unit be placed in HOT STANDBY within the next 6 hours, and COLD SHUTDOWN within the next 30 hours. ITS 3.6.7 REQUIRED ACTION F.2 states that 84 hours is allowed to place the unit in MODE 5. This changes CTS by allowing 48 hours more before requiring the unit to be brought to MODE 5.

The purpose of CTS 3.6.2.2 ACTION b and ITS 3.6.7 REQUIRED ACTION F.2 is to allow time to place the unit in a safe condition expeditiously without excessive stress on unit components. ITS 3.6.7 REQUIRED ACTION F.2 also allows an additional 48 hours in MODE 3 to restore an RS subsystem to OPERABLE status. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the allowed Completion Time. Two of the four RS subsystems remain OPERABLE and capable of providing all of the cooling capacity and 360° containment spray as assumed in the safety analysis, even with the reduced driving force in the RCS associated with MODE 3. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

L.3 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.2.2.1.c.1 and 4.6.2.2.1.c.2 require verification of the automatic actuation of RS components on a containment high-high pressure signal. ITS SR 3.6.7.6 states that automatic actuation of RS components may be performed with an actual or simulated actuation signal. This changes the CTS by explicitly allowing the use of either an actual or simulated signal for the test. The change from "containment high-high signal" to "actuation signal" is discussed in LA.4.

The purpose of CTS 4.6.2.2.1.c.1 and 4.6.2.2.1.c.2 is to verify that the specified RS components automatically actuate properly in response to an actuation signal. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. The equipment does not perform differently when actuated by an "actual" or "simulated" signal and, therefore, the results of the testing are unaffected by the type of signal used to initiate the test. This change allows taking credit for unplanned actuations if sufficient information is collected to satisfy the surveillance test requirements. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.4 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.2.2.1.c.2 requires verification that each automatic valve in the RS flow path actuates to its correct position on an actuation signal. ITS SR 3.6.7.6.a requires verification that each RS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to its correct position on an actuation signal. This changes the CTS by specifying that the verification applies only to automatic RS valves that are not locked, sealed, or otherwise secured in position.

The purpose of CTS 4.6.2.2.1.c.2 is to verify that appropriate valves automatically actuate when they receive an actuation signal. This change is acceptable because it

has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Proper position of valves is verified before they are locked, sealed, or otherwise secured in position. Administrative controls verify these valves are in their correct position before being locked, sealed, or otherwise secured, so they are not required to actuate on an actuation signal, and verification of their actuation is not required. The verification is to test that they actuate to their correct position, but these valves already are in their correct position. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

UNIT 1

ITS

CONTAINMENT SYSTEMS

CHEMICAL ADDITION SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.8

3.6.2.3 The chemical addition system shall be OPERABLE with:

a. A chemical addition tank containing a volume of between 4800 and 5500 gallons of between 12 and 13 percent by weight NaOH solution, and

b. A chemical addition flow path capable of adding NaOH solution from the chemical addition tank to both containment quench spray system pumps via the RWST.

(A.2)

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A
Action B

With the chemical addition system inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the spray addition system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 The chemical addition system shall be demonstrated OPERABLE:

SR 3.6.8.1

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

SR 3.6.8.2

b. At least once per 6 months by:

1. Verifying the contained solution volume in the tank is ≥ 4800 gallons and ≤ 5500 gallons, and (A.2)

SR 3.6.8.3

2. Verifying the concentration of the NaOH solution ~~by chemical~~ analysis is ≥ 12% and ≤ 13% (A.2) (LA.1)

A.1

ITS

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.6.8.4

c. At least once per 18 months, ~~during shutdown,~~ by verifying that each automatic valve in the flow path actuates to its correct position on a containment pressure high-high test signal. an actual or simulated actuation

LA.2

LA.3

L.1

SR 3.6.8.5

d. At least once per 5 years by verifying individual flow from the RWST and the chemical addition tank thru the drain lines in the cross connection between the respective tanks.

LA.4

that is not locked, sealed, or otherwise secured in position

L.2

UNIT 2

A.1

CONTAINMENT SYSTEMS

CHEMICAL ADDITION SYSTEM

ITS

LIMITING CONDITION FOR OPERATION

3.6.8

3.6.2.3 The chemical addition system shall be OPERABLE with:

a. A chemical addition tank containing a volume of between 4800 and 5500 gallons of between 12 and 13 percent by weight NaOH solution, and

b. A chemical addition flow path capable of adding NaOH solution from the chemical addition tank to both containment quench spray system pumps via the RWST.

A.2

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Action A
Action B

With the chemical addition system inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the chemical addition system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 The chemical addition system shall be demonstrated OPERABLE:

SR 3.6.8.1

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

SR 3.6.8.2

1. Verifying the contained solution volume in the tank is ≥ 4800 gallons and ≤ 5500 gallons, and (A.2)

SR 3.6.8.3

2. Verifying the concentration of the NaOH solution is ≥ 12% and ≤ 13% ~~by chemical analysis~~. (LA.1)

SR 3.6.8.4

c. At least once per 18 months ~~during shutdown~~ by verifying that each automatic valve in the flow path actuates to its correct position on a ~~Containment Pressure -- high-high test~~ an actual or simulated actuation signal. (A.2) (LA.2) (L.1) (LA.3)

SR 3.6.8.5

d. At least once per 5 years by verifying individual flow from the RWST and the chemical addition tank thru the drain lines in the cross connection between the respective tanks. (LA.4)

that is not locked, sealed, or otherwise secured in position (L2)

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

A.2 CTS LCO 3.6.2.3 contains a list of requirements that must be met for the Chemical Addition System to be OPERABLE. ITS LCO 3.6.8 still requires the Chemical Addition System to be OPERABLE, but the requirements for OPERABILITY are moved to Surveillances.

This change is acceptable because ITS SR 3.0.1 states that failure to meet a Surveillance is failure to meet the LCO. The movement of this information from the LCO to the Surveillances results in no change to the OPERABILITY requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance 4.6.2.3.b.2 requires verification of the concentration of NaOH solution in the chemical addition tank by chemical analysis. ITS SR 3.6.8.3 also requires verification of the NaOH solution concentration but does not specify how that verification is performed. This changes the CTS by moving the method of verification to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains requirement to verify

concentration of NaOH solution in the chemical addition tank. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.2 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance 4.6.2.3.c requires verification of the automatic actuation of the Chemical Addition System automatic valves every 18 months during shutdown. ITS SR 3.6.8.4 requires this testing every 18 months. This changes the CTS by moving the requirement that this testing be performed during shutdown to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify the automatic actuation of the Chemical Addition System automatic valves every 18 months. The method of testing requires the conditions that exist during a unit shutdown. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.3 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance 4.6.2.3.c requires verification of the automatic actuation of the Chemical Addition System automatic valves on a containment high-high pressure test signal. ITS SR 3.6.8.4 will not specify the name of the signal, but will only specify an actuation signal. This changes the CTS by moving the type of actuation signal to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement that appropriate Chemical Addition System automatic valves actuate on an actuation signal. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS,

which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.4 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance 4.6.2.3.d requires verification of flow from the RWST and the chemical addition tank every 5 years using the drain lines in the cross connection between the tanks. ITS SR 3.6.8.5 also requires verification of the flow from each solution's flow path every 5 years. This changes CTS by moving the specific requirement to verify the flow through the drain lines in the cross connection between the respective tanks to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to verify the flow from each solution's flow path. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program, described in Chapter 5 of the ITS, which provides for control of changes to the Bases and ensures that any changes to the Bases are properly evaluated. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS Surveillance 4.6.2.3.c requires verification of the automatic actuation of Chemical Addition System automatic valves on a containment high-high test signal. ITS SR 3.6.8.4 specifies that the testing may be performed with an actual or simulated (i.e., test) actuation signal. This changes the CTS by explicitly allowing the use of either an actual or simulated signal for the test. The change from "containment high-high signal" to "actuation signal" is discussed in LA.3.

The purpose of CTS 4.6.2.3.c is to ensure that each automatic valve in the flow path which is required to actuate and which receives an actuation signal actuates to its correct position. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Equipment can not discriminate between an "actual" or "simulated" signal and, therefore, the results of the testing are unaffected by the type of signal used to initiate the test. This change allows taking credit for unplanned actuations if sufficient information is collected to satisfy the surveillance test requirements. This

change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.2 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS Surveillance 4.6.2.3.c requires verification that each automatic valve in the flow path actuates to its correct position on a containment high-high test signal. ITS SR 3.6.8.4 requires verification that each automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to its correct position on an actual or simulated actuation signal. This changes the CTS by excluding those valves that are locked, sealed, or otherwise secured in position from this test. Removal of the containment - high-high pressure signal reference and addition of the actual or simulated actuation signal reference are addressed by Removed Detail and Less Restrictive changes respectively.

The purpose of CTS 4.6.2.3.c is to ensure that the valves which are required to actuate and which receive an actuation signal actuate to their correct position. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Those automatic valves that are locked, sealed, or otherwise secured in position are not required to actuate on a containment - high-high pressure signal in order to perform their safety function because they are already in the required position. Testing such valves would not provide any additional assurance of OPERABILITY. Valves that are required to actuate will continue to be tested. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

UNIT 1

A.1

ITS 3.6.9

05-12-95

ITS

CONTAINMENT SYSTEMS

ELECTRIC HYDROGEN RECOMBINERS

LIMITING CONDITION FOR OPERATION

3.6.9 3.6.4.2 Two separate and independent containment hydrogen recombiner systems (shared with Unit 2) shall be OPERABLE. LA.1

APPLICABILITY: MODES 1 and 2.

ACTION:

A.1 C.1 a. With one hydrogen recombiner system inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours.

INSERT Proposed Actions B.1 and B.2 L.2

A.1 NOTE b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.6.4.2 Each hydrogen recombiner system shall be demonstrated OPERABLE once per 18 months by:

3.6.9.1 a. Verifying, during a recombiner system functional test, that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes and is maintained for at least 2 hours and that each hydrogen recombiner purge blower operates for at least 15 minutes. LA.2

3.6.9.1 b. Verifying, during a recombiner system functional test using containment atmospheric air at a flow rate of greater than or equal to 50 scfm, that the heater temperature increases to greater than or equal to 1100°F within 5 hours and is maintained for at least 4 hours. LA.2

3.6.9.3 c. Verifying the integrity of all heater electrical circuits by performing a resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms. LA.2

3.6.9.2 d. Verifying, through a visual examination, that there is no evidence of abnormal conditions within the recombiner enclosure (i.e., loose wiring or structural connections, deposits of foreign materials, etc.). LA.2

e. Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits. L.1

UNIT 2

A.1

ITS 3.6.9
05-12-95

CONTAINMENT SYSTEMS

ITS

ELECTRIC HYDROGEN RECOMBINERS

LIMITING CONDITION FOR OPERATION

3.6.9 3.6.4.2 Two separate and independent containment hydrogen recombiner systems (shared with Unit 1) shall be OPERABLE. LA.1

APPLICABILITY: MODES 1 and 2.

ACTION:

A.1 C.1 a. With one hydrogen recombiner system inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours.

INSERT Proposed Actions B.1 and B.2

A.1 NOTE b. The provisions of Specification 3.0.4 are not applicable. L.2

SURVEILLANCE REQUIREMENTS

4.6.4.2 Each hydrogen recombiner system shall be demonstrated OPERABLE once per 18 months by:

SR 3.6.9.1 a. Verifying, during a recombiner system functional test, that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes and is maintained for at least 2 hours and that each hydrogen recombiner purge blower operates for at least 15 minutes. LA.2

SR 3.6.9.1 b. Verifying, during a recombiner system functional test using containment atmospheric air at a flow rate of greater than or equal to 50 scfm, that the heater temperature increases to greater than or equal to 1100°F within 8 hours and is maintained for at least 4 hours. LA.2

SR 3.6.9.3 c. Verifying the integrity of all heater electrical circuits by performing a resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms. LA.2

SR 3.6.9.2 d. Verifying, through a visual examination, that there is no evidence of abnormal conditions within the recombiner enclosure (i.e., loose wiring or structural connections, deposits of foreign materials, etc.). LA.2

e. Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits. L.1

ADMINISTRATIVE CHANGES

A.1 In the conversion of the North Anna Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 1, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

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

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA.1 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.4.2 states, 'Two separate and independent containment hydrogen recombiner systems," shared with Unit 2 or Unit 1 for the Unit 1 or Unit CTS, respectively, "shall be OPERABLE." ITS 3.6.9 states, "Two hydrogen recombiners shall be OPERABLE." This changes the CTS by moving the detail, "separate and independent," and the reference to the sharing of the systems between units to the Bases.

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

LA.2 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 4.6.4.2.a, CTS 4.6.4.2.b, CTS 4.6.4.2.c, and CTS 4.6.4.2.d include detail for performance of a functional test, resistance to ground test, and visual examination. ITS SR 3.6.9.1, ITS SR 3.6.9.2, and ITS SR 3.6.9.3 together require that each of these three tests be performed. This changes CTS by moving the detail of how these tests are performed to the Bases.

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to perform the functional test, visual examination, and resistance to ground test. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L.1 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.6.4.2.E requires performing a CHANNEL CALIBRATION of all instrumentation and control circuits on each hydrogen recombiner once per 18 months. ITS does not include this requirement. This changes the CTS by deleting a Surveillance Requirement.

The purpose of CTS 4.6.4.2.e is to verify that the hydrogen recombiner instrumentation and control circuits respond correctly to known inputs. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. The requirement to perform the functional test, visual examination, and resistance to ground test is retained and is adequate to verify that each hydrogen recombiner will perform its function when required. The hydrogen recombiners are manually initiated since flammable limits would not be reached until several days after a Design Basis Accident. A CHANNEL CALIBRATION is still required as part of ITS LCO 3.3.3 for the hydrogen analyzers, which are used to determine when to manually initiate the hydrogen recombiners. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.2 *(Category 3 – Relaxation of Completion Time)* CTS 3.6.4.2 states, "With one hydrogen recombiner system inoperable, restore the inoperable system to OPERABLE status within 30 days or be in at least HOT STANDBY within the next 6 hours." ITS 3.6.9 Condition A requires one inoperable hydrogen recombiner be restored to OPERABLE status within 30 days. ITS 3.6.9 Condition B requires that with two hydrogen recombiners inoperable, "Verify by administrative means that the hydrogen control function is maintained," within one hour and once per 12 hours thereafter, and, "Restore one hydrogen recombiner to OPERABLE status," within 7 days. This changes the CTS by allowing both hydrogen recombiners to be inoperable for 7 days if the Required Actions are met, instead of entering CTS LCO 3.0.3.

The purpose of CTS 3.6.4.2 is to provide the capability for controlling bulk hydrogen concentration in containment to less than the lower flammable concentration following a Design Basis Accident. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the allowed Completion Time. The change allows 7 days to restore at least one inoperable hydrogen recombiner to OPERABLE status when both hydrogen recombiners are inoperable, instead of entering LCO 3.0.3. The criteria for allowing this additional restoration time verifies that an alternate means of performing the hydrogen control function is available. Seven days is a reasonable time to allow two hydrogen recombiners to be inoperable because the hydrogen control function is maintained and because of the low probability of a LOCA that would generate hydrogen in the amounts capable of exceeding the flammability limit. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

SECTION 3.6 - CONTAINMENT SYSTEMS

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS

GENERIC NSHCs

10 CFR 50.92 EVALUATION
FOR
ADMINISTRATIVE CHANGES

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve reformatting, renumbering, and rewording of Technical Specifications with no change in intent. These changes, since they do not involve technical changes to the Technical Specifications, are administrative.

This type of change is connected with the movement of requirements within the current requirements, or with the modification of wording that does not affect the technical content of the current Technical Specifications. These changes will also include nontechnical modifications of requirements to conform to the Writer's Guide or provide consistency with the Improved Standard Technical Specifications in NUREG-1431. Administrative changes are not intended to add, delete, or relocate any technical requirements of the current Technical Specifications.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change involves reformatting, renumbering, and rewording the existing Technical Specifications. The reformatting, renumbering, and rewording process involves no technical changes to the existing Technical Specifications. As such, this change is administrative in nature and does not affect initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

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

3. Does this change involve a significant reduction in a margin of safety?

The proposed change will not reduce a margin of safety because it has no effect on any safety analyses assumptions. This change is administrative in nature. Therefore, the change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
MORE RESTRICTIVE CHANGES

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve adding more restrictive requirements to the existing Technical Specifications by either making current requirements more stringent or by adding new requirements that currently do not exist.

These changes include additional commitments that decrease allowed outage times, increase the frequency of surveillances, impose additional surveillances, increase the scope of specifications to include additional plant equipment, increase the applicability of specifications, or provide additional actions. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change provides more stringent requirements for operation of the facility. These more stringent requirements do not result in operation that will increase the probability of initiating an analyzed event and do not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements continue to ensure process variables, structures, systems, and components are maintained consistent with the safety analyses and licensing basis. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or changes in methods governing normal plant operation. The proposed change does impose different requirements. However, these changes are consistent with the assumptions in the safety analyses and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The imposition of more restrictive requirements either has no effect on or increases the margin of plant safety. As provided in the discussion of change, each change in this category is, by definition, providing additional restrictions to enhance plant safety. The change maintains requirements within the safety analyses and licensing basis. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
RELOCATED SPECIFICATIONS

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve relocating existing Technical Specification LCOs to licensee controlled documents.

The the Company has evaluated the current Technical Specifications using the criteria set forth in 10 CFR 50.36. Specifications identified by this evaluation that did not meet the retention requirements specified in the regulation are not included in the Improved Technical Specifications (ITS) submittal. These specifications have been relocated from the current Technical Specifications to the Technical Requirements Manual.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change relocates requirements and surveillances for structures, systems, components or variables that do not meet the criteria of 10 CFR 50.36 (c)(2)(ii) for inclusion in Technical Specifications as identified in the Application of Selection Criteria to the North Anna Technical Specifications. The affected structures, systems, components or variables are not assumed to be initiators of analyzed events and are not assumed to mitigate accident or transient events. The requirements and surveillances for these affected structures, systems, components or variables will be relocated from the Technical Specifications to the Technical Requirements Manual, which will be maintained pursuant to 10 CFR 50.59. In addition, the affected structures, systems, components or variables are addressed in existing surveillance procedures which are also controlled by 10 CFR.50.59 and subject to the change control provisions imposed by plant administrative procedures, which endorse applicable regulations and standards. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

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

3. Does this change involve a significant reduction in a margin of safety?

The proposed change will not reduce a margin of safety because it has no significant effect on any safety analyses assumptions, as indicated by the fact that the requirements do not meet the 10 CFR 50.36 criteria for retention. In addition, the relocated requirements are moved without change and any future changes to these requirements will be evaluated per 10 CFR 50.59.

NRC prior review and approval of changes to these relocated requirements, in accordance with 10 CFR 50.92, will no longer be required. This review and approval does not provide a specific margin of safety which can be evaluated. However, since the proposed change is consistent with the Westinghouse Standard Technical Specifications, NUREG-1431 issued by the NRC, revising the Technical Specifications to reflect the approved level of detail gives assurance that this relocation does not result in a significant reduction in the margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES - REMOVED DETAIL

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve moving details out of the Technical Specifications and into the Technical Specifications Bases, the UFSAR, the TRM or other documents under regulatory control such as the Quality Assurance Program Topical Report. The removal of this information is considered to be less restrictive because it is no longer controlled by the Technical Specification change process. Typically, the information moved is descriptive in nature and its removal conforms with NUREG-1431 for format and content.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change relocates certain details from the Technical Specifications to other documents under regulatory control. The Bases, UFSAR, and Technical Requirement Manual will be maintained in accordance with 10 CFR 50.59. In addition to 10 CFR 50.59 provisions, the Technical Specification Bases are subject to the change control provisions in the Administrative Controls Chapter of the Technical Specifications. The UFSAR is subject to the change control provisions of 10 CFR 50.71(e). Other documents are subject to controls imposed by Technical Specifications or regulations. Since any changes to these documents will be evaluated, no significant increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operations. The proposed change will not impose or eliminate any requirements, and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does this change involve a significant reduction in a margin of safety?**

   The proposed change will not reduce a margin of safety because it has no effect on any safety analysis assumptions. In addition, the details to be moved from the Technical Specifications to other documents are not being changed. Since any future changes to these details will be evaluated under the applicable regulatory change control mechanism,

no significant reduction in a margin of safety will be allowed. A significant reduction in the margin of safety is not associated with the elimination of the 10 CFR 50.92 requirement for NRC review and approval of future changes to the relocated details. The proposed change is consistent with the Westinghouse Standard Technical Specifications, NUREG-1431, issued by the NRC Staff, revising the Technical Specifications to reflect the approved level of detail, which indicates that there is no significant reduction in the margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 1
RELAXATION OF LCO REQUIREMENTS

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve relaxation of the current Technical Specification (CTS) Limiting Conditions for Operation (LCOs) by the elimination of specific items from the LCO or Tables referenced in the LCO, or the addition of exceptions to the LCO.

These changes reflect the ISTS approach to provide LCO requirements that specify the protective conditions that are required to meet safety analysis assumptions for required features. These conditions replace the lists of specific devices used in the CTS to describe the requirements needed to meet the safety analysis assumptions. The ITS also includes LCO Notes which allow exceptions to the LCO for the performance of testing or other operational needs. The ITS provides the protection required by the safety analysis and provides flexibility for meeting the conditions without adversely affecting operations since equivalent features are required to be OPERABLE. The ITS is also consistent with the plant current licensing basis, as may be modified in the discussion of individual changes. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change provides less restrictive LCO requirements for operation of the facility. These less restrictive LCO 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 in that the requirements continue to ensure process variables, structures, systems, and components are maintained consistent with the current safety analyses and licensing basis. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change does impose different requirements. However, the change is consistent with the assumptions in the current safety analyses and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The imposition of less restrictive LCO requirements does not involve a significant reduction in the margin of safety. As provided in the discussion of change, this change has been evaluated to ensure that the current safety analyses and licensing basis requirements are maintained. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 2
RELAXATION OF APPLICABILITY

The North Anna Nuclear Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve relaxation of the applicability of current Technical Specification (CTS) Limiting Conditions for Operation (LCOs) by reducing the conditions under which the LCO requirements must be met.

Reactor operating conditions are used in CTS to define when the LCO features are required to be OPERABLE. CTS Applicabilities can be specific defined terms of reactor conditions or more general such as, "all MODES" or "any operating MODE." Generalized applicability conditions are not contained in ITS, therefore the ITS eliminates CTS requirements such as "all MODES" or "any operating MODE," replacing them with ITS defined MODES or applicable conditions that are consistent with the application of the plant safety analysis assumptions for operability of the required features.

CTS requirements may also be eliminated during conditions for which the safety function of the specified safety system is met because the feature is performing its intended safety function. Deleting applicability requirements that are indeterminate or which are inconsistent with application of accident analyses assumptions is acceptable because when LCOs cannot be met, the TS may be satisfied by exiting the applicability which takes the plant out of the conditions that require the safety system to be OPERABLE.

This change provides the protection required by the safety analysis and provides flexibility for meeting limits by restricting the application of the limits to the conditions assumed in the safety analyses. The ITS is also consistent with the plant current licensing basis, as may be modified in the discussion of individual changes. The change is generally made to conform with NUREG-1431 and has been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change relaxes the conditions under which the LCO requirements for operation of the facility must be met. These less restrictive applicability requirements for the LCOs 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 in that the requirements continue to ensure that process variables, structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. Therefore, this change

does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The proposed change does impose different requirements. However, the requirements are consistent with the assumptions in the safety analyses and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does this change involve a significant reduction in a margin of safety?**

The relaxed applicability of LCO requirements does not involve a significant reduction in the margin of safety. As provided in the discussion of change, this change has been evaluated to ensure that the LCO requirements are applied in the MODES and specified conditions assumed in the safety analyses and licensing basis. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 3
RELAXATION OF COMPLETION TIME

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve relaxation of the Completion Times for Required Actions in the current Technical Specifications (CTS).

Upon discovery of a failure to meet an LCO, the ITS specifies times for completing Required Actions of the associated TS Conditions. Required Actions of the associated Conditions are used to establish remedial measures that must be taken within specified Completion Times (referred to as Allowed Outage Times (AOTs) in the CTS). These times define limits during which operation in a degraded condition is permitted. Adopting Completion Times from the ITS is acceptable because the Completion Times take into account the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. In addition, the ITS provides consistent Completion Times for similar conditions. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change relaxes the Completion Time for a Required Action. Required Actions and their associated Completion Times are not initiating conditions for any accident previously evaluated and the accident analyses do not assume that required equipment is out of service prior to the analyzed event. Consequently, the relaxed Completion Time does not significantly increase the probability of any accident previously evaluated. The consequences of an analyzed accident during the relaxed Completion Time are the same as the consequences during the existing AOT. As a result, the consequences of any accident previously evaluated are not significantly increased. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the method governing normal plant operation. The Required Actions and associated Completion Times in the ITS have been evaluated to ensure that no new accident initiators are introduced. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The relaxed Completion Time for a Required Action does not involve a significant reduction in the margin of safety. As provided in the discussion of change, the change has been evaluated to ensure that the allowed Completion Time is consistent with safe operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 4
RELAXATION OF REQUIRED ACTION

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve relaxation of the Required Actions in the current Technical Specifications (CTS).

Upon discovery of a failure to meet an LCO, the ITS specifies Required Actions to complete for the associated Conditions. Required Actions of the associated Conditions are used to establish remedial measures that must be taken in response to the degraded conditions. These actions minimize the risk associated with continued operation while providing time to repair inoperable features. Some of the Required Actions are modified to place the plant in a MODE in which the LCO does not apply. Adopting Required Actions from the ISTS is acceptable because the Required Actions take into account the operability status of redundant systems of required features, the capacity and capability of the remaining features, and the compensatory attributes of the Required Actions as compared to the LCO requirements. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change relaxes Required Actions. Required Actions and their associated Completion Times are not initiating conditions for any accident previously evaluated and the accident analyses do not assume that required equipment is out of service prior to the analyzed event. Consequently, the relaxed Required Actions do not significantly increase the probability of any accident previously evaluated. The Required Actions in the ITS have been developed to provide appropriate remedial actions to be taken in response to the degraded condition considering the operability status of the redundant systems of required features, and the capacity and capability of remaining features while minimizing the risk associated with continued operation. As a result, the consequences of any accident previously evaluated are not significantly increased. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The Required Actions and associated Completion Times in the ITS have been evaluated to ensure that no new accident initiators are introduced. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The relaxed Required Actions do not involve a significant reduction in the margin of safety. As provided in the discussion of change, this change has been evaluated to minimize the risk of continued operation under the specified Condition, considering the operability status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 5
DELETION OF SURVEILLANCE REQUIREMENT

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve deletion of Surveillance Requirements in the current Technical Specifications (CTS).

The CTS require safety systems to be tested and verified Operable prior to entering applicable operating conditions. The ITS eliminates unnecessary CTS Surveillance Requirements that do not contribute to verification that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change deletes Surveillance Requirements. Surveillances are not initiators to any accident previously evaluated. Consequently, the probability of an accident previously evaluated is not significantly increased. The equipment being tested is still required to be Operable and capable of performing the accident mitigation functions assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly affected. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. The remaining Surveillance Requirements are consistent with industry practice and are considered to be sufficient to prevent the removal of the subject Surveillances from creating a new or different type of accident. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The deleted Surveillance Requirements do not result in a significant reduction in the margin of safety. As provided in the discussion of change, the change has been evaluated to ensure that the deleted Surveillance Requirements are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 6
RELAXATION OF SURVEILLANCE REQUIREMENT ACCEPTANCE CRITERIA

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve the relaxation of Surveillance Requirements acceptance criteria in the current Technical Specifications (CTS).

The CTS require safety systems to be tested and verified Operable prior to entering applicable operating conditions. The ITS eliminates or relaxes the Surveillance Requirement acceptance criteria that do not contribute to verification that the equipment used to meet the LCO can perform its required functions. For example, the ITS allows some Surveillance Requirements to verify Operability under actual or test conditions. Adopting the ITS allowance for "actual" conditions is acceptable because required features cannot distinguish between an "actual" signal or a "test" signal. Also included are changes to CTS requirements that are replaced in the ITS with separate and distinct testing requirements which, when combined, include Operability verification of all TS required components for the features specified in the CTS. Adopting this format preference in the ISTS is acceptable because Surveillance Requirements that remain include testing of all previous features required to be verified OPERABLE. Changes which provide exceptions to Surveillance Requirements to provide for variations which do not affect the results of the test are also included in this category. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change relaxes the acceptance criteria of Surveillance Requirements. Surveillances are not initiators to any accident previously evaluated. Consequently, the probability of an accident previously evaluated is not significantly increased. The equipment being tested is still required to be Operable and capable of performing the accident mitigation functions assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly affected. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

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

3. Does this change involve a significant reduction in a margin of safety?

The relaxed acceptance criteria for Surveillance Requirements do not result in a significant reduction in the margin of safety. As provided in the discussion of change, the relaxed Surveillance Requirement acceptance criteria have been evaluated to ensure that they are sufficient to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner that gives confidence that the equipment can perform its assumed safety function. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 7
RELAXATION OF SURVEILLANCE FREQUENCY

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve the relaxation of Surveillance Frequencies in the current Technical Specifications (CTS).

CTS and ITS Surveillance Frequencies specify time interval requirements for performing surveillance testing. Increasing the time interval between Surveillance tests in the ITS results in decreased equipment unavailability due to testing which also increases equipment availability. In general, the ITS contain test frequencies that are consistent with industry practice or industry standards for achieving acceptable levels of equipment reliability. Adopting testing practices specified in the ITS is acceptable based on similar design, like-component testing for the system application and the availability of other Technical Specification requirements which provide regular checks to ensure limits are met. Relaxation of Surveillance Frequency can also include the addition of Surveillance Notes which allow testing to be delayed until appropriate unit conditions for the test are established, or exempt testing in certain MODES or specified conditions in which the testing can not be performed.

Reduced testing can result in a safety enhancement because the unavailability due to testing is reduced and; in turn, reliability of the affected structure, system or component should remain constant or increase. Reduced testing is acceptable where operating experience, industry practice or the industry standards such as manufacturers' recommendations have shown that these components usually pass the Surveillance when performed at the specified interval, thus the frequency is acceptable from a reliability standpoint. Surveillance Frequency changes to incorporate alternate train testing have been shown to be acceptable where other qualitative or quantitative test requirements are required which are established predictors of system performance. Surveillance Frequency extensions can be based on NRC-approved topical reports. The NRC staff has accepted topical report analyses that bound the plant-specific design and component reliability assumptions. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed change relaxes Surveillance Frequencies. The relaxed Surveillance Frequencies have been established based on achieving acceptable levels of equipment reliability. Consequently, equipment which could initiate an accident previously evaluated will continue to operate as expected and the probability of the initiation of any accident previously evaluated will not be significantly increased. The equipment being

tested is still required to be Operable and capable of performing any accident mitigation functions assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly affected. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

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

3. Does this change involve a significant reduction in a margin of safety?

The relaxed Surveillance Frequencies do not result in a significant reduction in the margin of safety. As provided in the discussion of change, the relaxation in the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Thus, appropriate equipment continues to be tested at a Frequency that gives confidence that the equipment can perform its assumed safety function when required. Therefore, this change does not involve a significant reduction in a margin of safety.

10 CFR 50.92 EVALUATION
FOR
LESS RESTRICTIVE CHANGES – CATEGORY 8
DELETION OF REPORTING REQUIREMENTS

The North Anna Power Station is converting to the Improved Technical Specifications (ITS) as outlined in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." Some of the proposed changes involve the deletion of requirements in the current Technical Specifications (CTS) to send reports to the NRC.

The CTS includes requirements to submit reports to the NRC under certain circumstances. However, the ITS eliminates these requirements for many such reports and, in many cases, relies on the reporting requirements of 10 CFR 50.73 or other regulatory requirements. The ITS changes to reporting requirements are acceptable because the regulations provide adequate reporting requirements, or the reports do not affect continued plant operation. Therefore, this change has no effect on the safe operation of the plant. These changes are generally made to conform with NUREG-1431 and have been evaluated to not be detrimental to plant safety.

In accordance with the criteria set forth in 10 CFR 50.92, the Company has evaluated these proposed Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change deletes reporting requirements. Sending reports to the NRC is not an initiator to any accident previously evaluated. Consequently, the probability of any accident previously evaluated is not significantly increased. Sending reports to the NRC has no effect on the ability of equipment to mitigate an accident previously evaluated. As a result, the consequences of any accident previously evaluated is not significantly affected. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

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

3. Does this change involve a significant reduction in a margin of safety?

The deletion of reporting requirements does not result in a significant reduction in the margin of safety. The ITS eliminates the requirements for many such reports and, in many cases, relies on the reporting requirements of 10 CFR 50.73 or other regulatory requirements. The change to reporting requirements does not affect the margin of safety because the regulations provide adequate reporting requirements, or the reports do not affect continued plant operation. Therefore, this change does not involve a significant reduction in a margin of safety.

This proposed Technical Specification change has been evaluated against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. It has been determined that the proposed change meets the criteria for categorical exclusion as provided for under 10 CFR 51.22(c)(9). The following is a discussion of how the proposed Technical Specification change meets the criteria for categorical exclusion.

10 CFR 51.22(c)(9): Although the proposed change involves changes to requirements with respect to inspection or surveillance requirements,

(i) proposed change involves No Significant Hazards Considerations (refer to the Determination of No Significant Hazards Considerations section of this Technical Specification Change Request);

(ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite since the proposed changes do not affect the generation of any radioactive effluents nor do they affect any of the permitted release paths; and

(iii) there is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Based on the aforementioned and pursuant to 10 CFR 51.22 (b), no environmental assessment or environmental affect statement need be prepared in connection with issuance of an amendment to the Technical Specifications incorporating the proposed change of this request.

SECTION 3.6 - CONTAINMENT SYSTEMS

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS

SPECIFIC NSHCs

There are no specific NSHC discussions for this Section.