DISCUSSION OF CHANGES
ITS 3.6.7, SHIELD BUILDING

~~repair inoperable features. This change provides an ACTION that allows 24 hours to restore the shield building to OPERABLE status. The Required Actions and associated 24 hour Completion Time are reasonable considering the limited leakage design of containment and the low probability of DBA occurring during this period. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.~~

CET003

Not used

L02 ~~*(Category 7 – Relaxation Of Surveillance Frequency)* CTS 4.6.1.8.d.4 requires a drawdown of the shield building annulus by each Emergency Gas Treatment System (EGTS) train to within limits at least once per 18 months. ITS SR 3.6.7.4 requires a drawdown of the shield building annulus to within limits "In accordance with the Surveillance Frequency Control Program." The specified Surveillance Frequency that is being moved to the Surveillance Frequency Control Program is "18 months on a STAGGERED TEST BASIS for each Emergency Gas Treatment System train." This changes the CTS by allowing the drawdown test for each EGTS train to be performed less frequently. Moving the specified Surveillance Frequency to the Surveillance Frequency Control Program is discussed in DOC LA03.~~

~~The purpose of CTS 4.6.1.8.d.4 is to verify the integrity of the shield building boundary by ensuring the shield building annulus can be rapidly drawn to a negative pressure of at least 0.5 inches water gauge. Therefore, this is a test of shield building integrity and does not need to be performed every 18 months using each EGTS train. Staggering use of the EGTS trains every 18 months will ensure both trains are capable of performing the test. This change is acceptable because performing the drawdown test using one train of EGTS every 18 months will adequately verify shield building integrity. OPERABILITY of EGTS will be maintained through the application of the requirements of ITS 3.6.10. This change is designated as less restrictive, because the shield building annulus drawdown Surveillance will be performed less frequently with each EGTS train under the ITS than under the CTS.~~

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

CTS

Shield Building (Dual and Ice Condenser) 3.6.8 7 (1)

3.6 CONTAINMENT SYSTEMS

3.6.8 7 Shield Building (Dual and Ice Condenser) (1) (3)

3.6.1.7 LCO 3.6.8 7 The shield building shall be OPERABLE.

INSERT 1

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

CET003

ACTIONS

A02

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. Shield building inoperable.	A.1 Restore shield building to OPERABLE status.	24 hours 1 hour (7)
DOC A02 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
DOC M01 SR 3.6.8.1 7 [Verify annulus negative pressure is > [5] inches water gauge. ≥	[12 hours OR In accordance with the Surveillance Frequency Control Program] (1) (4) (5) (8) (5)

3

INSERT 1

annulus

CET003

--NOTE--

1.30.a The access doors may be opened for normal transit entry and exit.

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CTS

Shield Building (Dual and Ice Condenser)
3.6.8 7 1

CET003

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
DOC M01	SR 3.6.8.2 (7) (1) — Verify ~~one shield building~~ [the] access door [annulus] ~~in each access opening~~ is closed.	[31 days OR In accordance with the Surveillance Frequency Control Program]	8 1 6 5 5
4.6.1.7	SR 3.6.8.3 (7) (2) — [Verify shield building structural integrity by performing a visual inspection of the [accessible] exposed interior and exterior surfaces of the shield building.	During shutdown for SR 3.6.1.1 Type A tests]	1 8 4
~~4.6.1.8.d.4~~	~~SR 3.6.8.4~~ (7) — ~~Verify the shield building can be maintained at a pressure equal to or more negative than [-0.5] inch water gauge in the annulus by one Shield Building Air Cleanup System train with final flow ≤ [ ] cfm within [22] seconds after a start signal.~~ [Emergency Gas Treatment System] [60]	~~[[18] months on a STAGGERED TEST BASIS for each Shield Building Air Cleanup System train OR In accordance with the Surveillance Frequency Control Program]~~	~~1 4 2 7 4 5 5~~ 9

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CTS

1

3.6 CONTAINMENT SYSTEMS

3.6.8 7 Shield Building (Dual and Ice Condenser)

3.6.1.7 LCO 3.6.8 7 The shield building shall be OPERABLE. INSERT 1

1 3

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

CET003

ACTIONS

A02	CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01	A. Shield building inoperable.	A.1 Restore shield building to OPERABLE status.	24 hours 1 hour (7)
DOC A02	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
DOC M01	SR 3.6.8.1 7 [Verify annulus negative pressure is > [5] inches water gauge. ≥	[12 hours OR In accordance with the Surveillance Frequency Control Program]

1 4 5 8 5

2 1

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~~CTS~~ 3.6.7

3

INSERT 1

annulus

--NOTE--

1.30.a The access doors may be opened for normal transit entry and exit. CET003

CTS

Shield Building (Dual and Ice Condenser)
3.6.8 7 (1)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M01 CET003	SR 3.6.8.2 (1) (7)	Verify (the) one shield building (annulus) access door in each access opening is closed.	[31 days OR In accordance with the Surveillance Frequency Control Program]	(8) (1) (6) (5) (5)
4.6.1.7	SR 3.6.8.3 (7) (2)	[Verify (accessible) shield building structural integrity by performing a visual inspection of the exposed interior and exterior surfaces of the shield building.	During shutdown for SR 3.6.1.1 Type A tests]	(1) (8) (4)
4.6.1.8.d.4	SR 3.6.8.4 (7)	Verify the shield building can be maintained at a pressure equal to or more negative than [-0.5] inch water gauge in the annulus by one Shield Building Air Cleanup System (Emergency Gas Treatment System) train with final flow ≤ [ ] cfm within [22] (60) seconds after a start signal.	[[18] months on a STAGGERED TEST BASIS for each Shield Building Air Cleanup System train OR In accordance with the Surveillance Frequency Control Program]	(1) (4) (2) (7) (4) (5) (9) (5)

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.7, SHIELD BUILDING

1. The heading and title for ISTS 3.6.8 include the parenthetical expression (Dual and Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7). Therefore, ISTS 3.6.7 is not included in the SQN ITS and ISTS 3.6.8 is renumbered as ITS 3.6.7.

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. There is no allowance in ISTS 3.6.8 for when ~~a shield building~~ the annulus access door is open for normal transit entry and exit, thereby requiring entry into Condition A. Therefore, an exception to the requirement that the annulus access opening door~~s~~ be closed is made to allow for normal transit entry and exit. The basis of this exception is the assumption that the transit time during which ~~a~~ the door is open will be short (i.e., shorter than the Completion Time for Condition A). This change is consistent with the current licensing basis as defined in CTS 1.30, definition of SHIELD BUILDING INTEGRITY, which provides this exception to the requirement for the door in each access opening to be closed. CET003

4. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

5. ISTS ~~SR 3.6.8.1,~~ SR 3.6.8.2~~, and SR 3.6.8.4~~ provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance ~~Frequencies~~ Frequency for ITS SR 3.6.7.1~~, SR 3.6.7.2, and SR 3.6.7.4~~ under the Surveillance Frequency Control Program.

6. ISTS SR 3.6.8.2 requires verification that ~~"~~one~~"~~ access door in each shield building access opening is closed. ~~However,~~ SQN design consists of one door for ~~each~~ one shield building access opening. Therefore, the Surveillance is changed to verify ~~"the" shield building~~ annulus access door ~~in each access opening~~ closed, thereby reflecting the plant-specific design.

7. The Completion Time associated with ISTS 3.6.8, Required Action A.1 is modified from 24 hours to 1 hour to reflect the SQN current licensing basis as described in Discussion of Change A02. ~~ISTS SR 3.6.8.4 requires verification that the Shield Building can be maintained at a negative pressure relative to the annulus by one train within a specified time and flow rate after a start signal. ITS SR 3.6.7.4 will require a similar test, but will not specify a flow rate for the EGTS train. The current licensing basis for this acceptance criteria is derived from the license amendment requested by TVA and approved by the NRC on December 23, 1982.~~

8. ISTS SR 3.6.8.1 is not included in SQN ITS 3.6.7 because this Surveillance is not included in the SQN current Technical Specifications. As a result, ISTS SRs 3.6.8.2 and 3.6.8.3 are renumbered to ITS SRs 3.6.7.1 and 3.6.7.2.

9. ISTS SR 3.6.8.4 verifies that the Shield Building Air Cleanup System can maintain a negative pressure within the shield building following a start signal. In the SQN ITS, this Surveillance is moved to ITS 3.6.10, "Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem," (ISTS 3.6.13) consistent with the SQN current Technical Specifications.

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

1

7

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 Shield Building (Dual and Ice Condenser)

7

1

BASES

BACKGROUND

The shield building is a concrete structure that surrounds the steel containment vessel. Between the containment vessel and the shield building inner wall is an annular space that collects containment leakage that may occur following a loss of coolant accident (LOCA). This space also allows for periodic inspection of the outer surface of the steel containment vessel.

CET003

Insert 3

Emergency Gas Treatment System (EGTS)

The Shield Building Air Cleanup System (SBACS) establishes a negative pressure in the annulus between the shield building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment. The shield building is required to be OPERABLE to ensure retention of containment leakage and proper operation of the SBACS.

2

INSERT 1

EGTS

Air Cleanup Subsystem

APPLICABLE SAFETY ANALYSES

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

Air Cleanup Subsystem

The shield building satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Shield building OPERABILITY must be maintained to ensure proper operation of the SBACS and to limit radioactive leakage from the containment to those paths and leakage rates assumed in the accident analyses.

EGTS

2

INSERT 2

2

APPLICABILITY

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

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

2

INSERT 1

The isolation devices for the penetrations in the shield building boundary are a part of the shield building leak tight barrier. To maintain the shield building boundary leak tight, the sealing mechanism associated with each penetration (e.g., welds, bellows, or O-rings) are required to be OPERABLE.

CET003

3

INSERT 2

The LCO is modified by a Note to allow the ~~shield building~~ annulus access door~~s~~ to be opened to allow normal transit entry and exit. The basis of this exception is the assumption that, for normal transit, the time during which ~~a~~ the door is open will be short (i.e., shorter than the Completion Time for Condition A).

Access to the annulus area of the shield building is provided via the reactor building access room door and the water tight annulus access door located on 690 ft. elevation. During normal operation, these doors provide personnel and equipment access to the shield building annulus area and are equipped with electrical interlocks to assure that one door is always closed.

INSERT 3

is a system consisting of two subsystems:

a. annulus vacuum control subsystem, and

b. air cleanup subsystem.

The annulus vacuum control subsystem is used during normal operation to establish and maintain a negative pressure in the annulus space. The annulus vacuum control subsystem does not perform any safety function.

The air cleanup subsystem operates during a LOCA to establish and maintain a negative annulus pressure of at least 0.5 inches water gauge. Filters in the subsystem then control the release of radioactive contaminates to the environment. The EGTS air cleanup subsystem OPERABILITY requirements are specified in LCO 3.6.10, "Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem."

BASES

ACTIONS

CET003

A.1

In the event shield building OPERABILITY is not maintained, shield building OPERABILITY must be restored within 24 hours. Twenty-four hours 1 hour. One hour is a reasonable Completion Time considering the limited leakage design of containment and the low probability of a Design Basis Accident occurring during this time period. This specified time period is also consistent with the ACTIONS of LCO 3.6.1, "Containment," which requires the containment be restored to OPERABLE status within 1 hour.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

[SR 3.6.8.1

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

OR

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

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.2 1 7

1 3

Maintaining shield building OPERABILITY requires verifying one door in the access opening closed. [An access opening may contain one inner and one outer door, or in some cases, shield building access openings are shared such that a shield building barrier may have multiple inner or multiple outer doors. The intent is to not breach the shield building boundary at any time when the shield building boundary is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times.] However, all shield building access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. [The 31 day Frequency of this SR is based on engineering judgment and is considered adequate in view of the other indications of door status that are available to the operator.

the

s

The

The annulus

is

4

7

5

CET003

OR

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

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

6

2

7

[SR 3.6.8.3

A visual inspection of the accessible shield building interior and exterior surfaces and verification that no apparent changes in the concrete surface appearance or other abnormal degradation will

4 1

8

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

4

BASES

SURVEILLANCE REQUIREMENTS (continued)

3

CET003

SR 3.6.8.4 7 1

The Shield Building Air Cleanup System EGTS produces a negative pressure to prevent leakage from the building. SR 3.6.8.4 7 verifies that the shield building can be rapidly drawn down to [-0.5] inch water gauge in the annulus. This test is used to ensure shield building boundary integrity. Establishment of this pressure is confirmed by SR 3.6.8.4 7, which demonstrates that the shield building can be drawn down to ≤ [-0.5] inches of vacuum water gauge in the annulus ≤ [22] 60 seconds using one Shield Building Air Cleanup System EGTS train. The time limit ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. Since this SR is a shield building boundary integrity test, it does not need to be performed with each Shield Building Air Cleanup System EGTS train. [The Shield Building Air Cleanup System train used for this Surveillance is staggered to ensure that in addition to the requirements of LCO 3.6.8.4, either train will perform this test.] The primary purpose of this SR is to ensure shield building integrity. The secondary purpose of this SR is to ensure that the Shield Building Air Cleanup System EGTS train being tested functions as designed. The inoperability of the Shield Building Air Cleanup System EGTS train does not necessarily constitute a failure of this Surveillance relative to the shield building OPERABILITY. [The 18 month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage.

OR

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

--------------------------------REVIEWER'S NOTE--------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 6

REFERENCES None.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.8 Shield Building (Dual and Ice Condenser)

7 1

BASES

BACKGROUND

The shield building is a concrete structure that surrounds the steel containment vessel. Between the containment vessel and the shield building inner wall is an annular space that collects containment leakage that may occur following a loss of coolant accident (LOCA). This space also allows for periodic inspection of the outer surface of the steel containment vessel.

CET003

Insert 3

Emergency Gas Treatment System (EGTS)

The Shield Building Air Cleanup System (SBACS) establishes a negative pressure in the annulus between the shield building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment. The shield building is required to be OPERABLE to ensure retention of containment leakage and proper operation of the SBACS. EGTS Air Cleanup Subsystem

INSERT 1

2

APPLICABLE SAFETY ANALYSES

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

Air Cleanup Subsystem

The shield building satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Shield building OPERABILITY must be maintained to ensure proper operation of the EGTS SBACS and to limit radioactive leakage from the containment to those paths and leakage rates assumed in the accident analyses. INSERT 2

2 2

APPLICABILITY

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

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

2 **INSERT 1**

The isolation devices for the penetrations in the shield building boundary are a part of the shield building leak tight barrier. To maintain the shield building boundary leak tight, the sealing mechanism associated with each penetration (e.g., welds, bellows, or O-rings) are required to be OPERABLE.

CET003

3 **INSERT 2**

The LCO is modified by a Note to allow the ~~shield building~~ annulus access door~~s~~ to be opened to allow normal transit entry and exit. The basis of this exception is the assumption that, for normal transit, the time during which ~~a~~ the door is open will be short (i.e., shorter than the Completion Time for Condition A).

Access to the annulus area of the shield building is provided via the reactor building access room door and the water tight annulus access door located on 690 ft. elevation. During normal operation, these doors provide personnel and equipment access to the shield building annulus area and are equipped with electrical interlocks to assure that one door is always closed.

INSERT 3

is a system consisting of two subsystems:

a. annulus vacuum control subsystem, and

b. air cleanup subsystem.

The annulus vacuum control subsystem is used during normal operation to establish and maintain a negative pressure in the annulus space. The annulus vacuum control subsystem does not perform any safety function.

The air cleanup subsystem operates during a LOCA to establish and maintain a negative annulus pressure of at least 0.5 inches water gauge. Filters in the subsystem then control the release of radioactive contaminates to the environment. The EGTS air cleanup subsystem OPERABILITY requirements are specified in LCO 3.6.10, “Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem.”

BASES

ACTIONS

A.1

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

1 hour. One hour

3

This specified time period is also consistent with the ACTIONS of LCO 3.6.1, "Containment," which requires the containment be restored to OPERABLE status within 1 hour.

CET003

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

[SR 3.6.8.1

7

3

4 1

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

OR

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

5

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

6

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.2 ← 1 7

1 3

Maintaining shield building OPERABILITY requires verifying one door in the access opening closed. [An access opening may contain one inner and one outer door, or in some cases, shield building access openings are shared such that a shield building barrier may have multiple inner or multiple outer doors. The intent is to not breach the shield building boundary at any time when the shield building boundary is required. This is achieved by maintaining the inner or outer portion of the barrier closed at all times.] However, all shield building access doors are normally kept closed, except when the access opening is being used for entry and exit or when maintenance is being performed on an access opening. [The 31 day Frequency of this SR is based on engineering judgment and is considered adequate in view of the other indications of door status that are available to the operator.

(Markup insertions: "the", "s", "The", "The annulus", "is", "Stet", "Stet", "CET003") 4 7 5

OR

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

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

6

2

[SR 3.6.8.3 7

A visual inspection of the accessible shield building interior and exterior surfaces and verification that no apparent changes in the concrete surface appearance or other abnormal degradation will

4 1 8

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

4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.8.4 7 1

The Shield Building Air Cleanup System EGTS produces a negative pressure to prevent leakage from the building. SR 3.6.8.4 7 verifies that the shield building can be rapidly drawn down to [-0.5] inch water gauge in the annulus. This test is used to ensure shield building boundary integrity. Establishment of this pressure is confirmed by SR 3.6.8.4 7, which demonstrates that the shield building can be drawn down to ≤ [-0.5] inches of vacuum water gauge in the annulus ≤ [22] 60 seconds using one Shield Building Air Cleanup System EGTS train. The time limit ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. Since this SR is a shield building boundary integrity test, it does not need to be performed with each Shield Building Air Cleanup System EGTS train. [The Shield Building Air Cleanup System train used for this Surveillance is staggered to ensure that in addition to the requirements of LCO 3.6.8.4, either train will perform this test.] The primary purpose of this SR is to ensure shield building integrity. The secondary purpose of this SR is to ensure that the Shield Building Air Cleanup System EGTS train being tested functions as designed. The inoperability of the Shield Building Air Cleanup System EGTS train does not necessarily constitute a failure of this Surveillance relative to the shield building OPERABILITY. [The 18 month Frequency is based on the need to perform this Surveillance under conditions that apply during a plant outage.

OR

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

3 CET003 2 4 1 5 6

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

REFERENCES None.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.7 BASES, SHIELD BUILDING

1. The heading and title for ISTS 3.6.8 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7). Therefore, ISTS 3.6.7 is not included in the SQN ITS and ISTS 3.6.8 is renumbered as ITS 3.6.7.

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

3. Changes have been made to be consistent with changes made to the Specification.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

CET003

5. ISTS ~~SR 3.6.8.1,~~ SR 3.6.8.2~~, and SR 3.6.8.4~~ provide s two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance ~~Frequencies~~ Frequency for ITS SR 3.6.7.1~~, SR 3.6.7.2, and SR 3.6.7.4~~ under the Surveillance Frequency Control Program.

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

7. There are no allowances in the LCO for a shield building access opening door to be open when maintenance is being performed on an access opening.

8. Changes are made to include details moved from the Current Technical Specifications to the Bases.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.7, SHIELD BUILDING

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 8

ITS 3.6.8, HYDROGEN MITIGATION SYSTEM

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

A01

ITS ITS 3.6.8

CONTAINMENT SYSTEMS

HYDROGEN MITIGATION SYSTEM

LIMITING CONDITION FOR OPERATION

two trains A02

LCO 3.6.8 3.6.4.3 The ~~primary containment~~ hydrogen mitigation system shall be operable. A01

Applicability APPLICABILITY: MODES 1 and 2.

ACTION:

ACTION A With one train of hydrogen mitigation system inoperable, restore the inoperable train to OPERABLE status within 7 days or increase the surveillance interval of S.R. 4.6.4.3 from 92 days to 7 days on the operable train ~~until the inoperable train is returned to OPERABLE status~~. A03

Add proposed ACTIONS B and C L01

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program LA01

4.6.4.3 The hydrogen mitigation system shall be demonstrated OPERABLE:

M01

SR 3.6.8.1, SR 3.6.8.2 a. ~~At least once per 92 days~~ by energizing the supply breakers and verifying that at least ~~66 of 68~~ 33 igniters are energized in each train.*

LA02

SR 3.6.8.3 b. ~~At least once per 18 months~~ by verifying the temperature of each igniter is a minimum of 1700°F.

In accordance with the Surveillance Frequency Control Program LA01

~~LCO 3.6.8,~~ SR 3.6.8.2 * Inoperable igniters must not be on corresponding redundant circuits which provide coverage for the same region. CSS-035

A01

ITS ITS 3.6.8

CONTAINMENT SYSTEMS

HYDROGEN MITIGATION SYSTEM

LIMITING CONDITION FOR OPERATION

LCO 3.6.8 3.6.4.3 The ~~primary containment~~ [two] hydrogen mitigation system [trains] shall be operable. A02 A01

Applicability APPLICABILITY: MODES 1 and 2.

ACTION

ACTION A With one train of hydrogen mitigation system inoperable, restore the inoperable train to OPERABLE status within 7 days or increase the surveillance interval of S.R. 4.6.4.3 from 92 days to 7 days on the operable train ~~until the inoperable train is returned to OPERABLE status~~. A03

[Add proposed ACTIONS B and C] L01

SURVEILLANCE REQUIREMENTS

4.6.4.3 The hydrogen mitigation system shall be demonstrated OPERABLE: [In accordance with the Surveillance Frequency Control Program] LA01

SR 3.6.8.1, SR 3.6.8.2 a. ~~At least once per 92 days~~ by energizing the supply breakers and verifying that at least ~~66 of 68~~ [33] igniters are energized [in each train].* M01 LA02

SR 3.6.8.3 b. ~~At least once per 18 months~~ [In accordance with the Surveillance Frequency Control Program] by verifying the temperature of each igniter is a minimum of 1700°F. LA01

~~LCO 3.6.8,~~ SR 3.6.8.2 * Inoperable igniters must not be on corresponding redundant circuits which provide coverage for the same region. CSS-035

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DISCUSSION OF CHANGES
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.6.4.3 states "The primary containment hydrogen mitigation system shall be operable." ITS LCO 3.6.8 states "Two hydrogen mitigation system trains shall be OPERABLE." This changes the CTS by stating the number of trains required for operation.

The purpose of CTS 3.6.4.3 is to ensure that combustible gas generated from a metal-water reaction is controlled so that there is no loss of the containment structure integrity. Changing from a system basis to a train basis does not change the requirements for OPERABILITY but adds clarification. This change is designated as an administrative change since it does not result in a technical change to the CTS.

A03 CTS 3.6.4.3 ACTION requires, in part, when one train of hydrogen mitigation system is inoperable to increase the surveillance Frequency of SR 4.6.4.3 from 92 days to 7 days on the operable train until the inoperable train is returned to OPERABLE status. ITS 3.6.8 requires, in part, when one train of hydrogen mitigation system is inoperable to perform SR 3.6.8.1 on the OPERABLE train once per 7 days. This changes the CTS by not including the detail that the Surveillance Requirement must be performed until the inoperable train is restored to OPERABLE status.

The purpose of the CTS 3.6.4.3 ACTION is to ensure the Surveillance Requirement is performed once per 7 days as long as the unit is operating in the ACTION. ITS LCO 3.0.2 states if the LCO is met prior to expiration of the specified Completion Time(s), completion of the Required Action is not required unless otherwise stated. Since the requirement of the CTS 3.6.4.3 ACTION is stated in ITS LCO 3.0.2 and it is applicable to ITS 3.6.8, the explicit statement "until the inoperable train is returned to OPERABLE status" is not necessary in the ITS Required Action. This change is designated as administrative because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.6.4.3.a requires, in part, verification that 66 hydrogen mitigation system ignitors are energized. ITS SR 3.6.8.1 requires, in part, verification that 33 hydrogen mitigation system ignitors are energized in each train. This changes the CTS by specifying that of the required 66 hydrogen mitigation system

DISCUSSION OF CHANGES
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

ignitors, 33 hydrogen mitigation system ignitors are required to be energized in each train.

The purpose of CTS 3.6.4.3 is to ensure that combustible gas generated from a metal-water reaction is controlled so that there is no loss of the containment structure integrity. This change is acceptable, because it will ensure that sufficient ignitors are available in each train, so that redundancy between the trains is maintained. Specifying that each hydrogen mitigation system train consists of at least 33 ignitors is consistent with the current licensing basis as described in the UFSAR. This change is designated as more restrictive because new requirements related to the hydrogen mitigation system are being included in the ITS that are not required in the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 - Removal of SR Requirement to the Surveillance Frequency Control Program)* CTS 4.6.4.3.a requires energizing the supply breakers and verifying that at least 66 of 68 igniters are energized at least once per 92 days. Additionally, CTS 4.6.4.3.a contains footnote * which states that inoperable igniters must not be on corresponding redundant circuits which provide coverage for the same region. CTS 4.6.4.3.b requires verification that the temperature of each igniter is a minimum of 1700 ^{o}F at least once per 18 months. ITS SR 3.6.8.1, SR 3.6.8.2, and SR 3.6.8.3 require similar Surveillances and specify the periodic Frequency as "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for the Surveillance Requirements and the Bases for the Frequencies to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

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DISCUSSION OF CHANGES
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 4.6.4.3.a requires, in part, the verification that at least 66 of 68 igniters are energized. ITS 3.6.8.1 requires, in part, verification that greater than or equal to 33 ignitors are energized in each train. This changes the CTS by moving the total number of ignitors to the Bases. The change to the number of ignitors on a train basis is in DOC A02.

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 at least 66 ignitors (33 per train) are energized. 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.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.6.4.3 ACTION does not state what follow up ACTION to take when it cannot be met or when one containment region does not have an OPERABLE hydrogen ignitor. Thus, entry into CTS 3.0.3 is required. For this Specification, CTS 3.0.3 allows one hour to take action and 7 hours to place the unit in HOT STANDBY (MODE 3). ITS 3.6.8 ACTION B requires that when one containment region has no OPERABLE hydrogen ignitor to restore one hydrogen ignitor in the affected containment region to OPERABLE status within 7 days. ITS 3.6.8 ACTION C requires that when the Required Action and associated Completion Time of Condition A or B is not met, to be in MODE 3 within 6 hours. This changes the CTS by allowing 7 days to restore one hydrogen ignitor in the affected containment region to OPERABLE status. Additionally, it allows 6 hours to be in MODE 3 when one train of hydrogen mitigation can't be restored to OPERABLE status within 7 days or when the surveillance interval on the operable train cannot be met.

The change from CTS 3.0.3 to ITS 3.6.8 ACTION B is acceptable because the Required Action is used to establish remedial measures that must be taken in response to the degraded condition in order to minimize risk associated with continued operation while providing time to repair the inoperable feature. The 7 day Completion Time is based on the low probability of the occurrence of a degraded core event that would generate hydrogen in amounts equivalent to a metal water reaction of 75% of the core cladding, the length of time after the event that operator action would be required to prevent hydrogen accumulation from exceeding this limit, and the low probability of failure of the OPERABLE hydrogen mitigation system (HMS) train. Furthermore, the adjacent containment regions would provide flame propagation for the region without an OPERABLE ignitor. The addition of ITS 3.6.8 ACTION C is acceptable because when the Required Action or associated Completion Time of Condition A or B cannot be met, the ACTION will place the unit in a MODE which is outside of the

DISCUSSION OF CHANGES
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

Applicability. The 6 hour Completion Time is acceptable because it is based on operating experience and is a reasonable time to reach MODE 3 from full power. This change is designated as less restrictive because a less stringent Required Actions are being applied in the ITS than were applied in the CTS.

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

CTS

HIS (Ice Condenser) HMS 1
3.6.10 8

3.6 CONTAINMENT SYSTEMS

3.6.10 8 Hydrogen Ignition Mitigation System (HIS HMS) (Ice Condenser) 1

3.6.4.3 LCO 3.6.10 8 Two HIS HMS trains shall be OPERABLE. 1

INSERT 1 CSS-035 5

Applicability APPLICABILITY: MODES 1 and 2.

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
ACTION	A. One HIS HMS train inoperable.	A.1	Restore HIS HMS train to OPERABLE status.	7 days	1
		OR			
		A.2	Perform SR 3.6.10 8.1 on the OPERABLE train.	Once per 7 days	1
DOC L01	B. One containment region with no OPERABLE hydrogen ignitor.	B.1	Restore one hydrogen ignitor in the affected containment region to OPERABLE status.	7 days	
DOC L01	C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours	

CTS 3.6.8

5 **INSERT 1**

AND

Footnote * Each containment region shall have at least one OPERABLE hydrogen ignitor. CSS-035

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CTS

HIS (Ice Condenser) HMS 1
3.6.10 8

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.6.4.3.a	SR 3.6.10.1 8	Energize each HIS HMS train power supply breaker and verify ≥ [32] 33 ignitors are energized in each train.	[92 days OR In accordance with the Surveillance Frequency Control Program] 1 3 4 4
Footnote *	SR 3.6.10.2 8	Verify at least one hydrogen ignitor is OPERABLE in each containment region.	[92 days OR In accordance with the Surveillance Frequency Control Program] 1 4 4
4.6.4.3.b	SR 3.6.10.3 8	Energize each hydrogen ignitor and verify temperature is ≥ [1700]°F.	[[18] months OR In accordance with the Surveillance Frequency Control Program] 1 3 4 4

CTS

HIS (Ice Condenser) HMS
3.6.10 8 (1)

3.6 CONTAINMENT SYSTEMS

3.6.10 8 Hydrogen Ignition Mitigation System (HIS HMS) (Ice Condenser) (1)

3.6.4.3 LCO 3.6.10 8 Two HIS HMS trains shall be OPERABLE. (1)

INSERT 1 CSS-035 (5)

Applicability APPLICABILITY: MODES 1 and 2.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION	A. One HIS HMS train inoperable.	A.1 Restore HIS HMS train to OPERABLE status. OR A.2 Perform SR 3.6.10 8.1 on the OPERABLE train.	7 days Once per 7 days	(1) (1)
DOC L01	B. One containment region with no OPERABLE hydrogen ignitor.	B.1 Restore one hydrogen ignitor in the affected containment region to OPERABLE status.	7 days	
DOC L01	C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours	

CTS 3.6.8

5 **INSERT 1**

AND

Footnote * Each containment region shall have at least one OPERABLE hydrogen ignitor. CSS-035

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CTS

HIS (Ice Condenser) HMS
3.6.10 8 (1)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.4.3.a	SR 3.6.10.1 (8)	Energize each HIS HMS train power supply breaker and verify ≥ [32] (33) ignitors are energized in each train.	[92 days OR In accordance with the Surveillance Frequency Control Program]	(3) (1) (4) (4)
Footnote *	SR 3.6.10.2 (8)	Verify at least one hydrogen ignitor is OPERABLE in each containment region.	[92 days OR In accordance with the Surveillance Frequency Control Program]	(1) (4) (4)
4.6.4.3.b	SR 3.6.10.3 (8)	Energize each hydrogen ignitor and verify temperature is ≥ [1700]°F.	[[18] months OR In accordance with the Surveillance Frequency Control Program]	(3) (1) (4) (4)

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JUSTIFICATION FOR DEVIATIONS
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

1. The ISTS 3.6.10 title "Hydrogen Ignition System" has been changed to "Hydrogen Mitigation System" consistent with the Sequoyah Nuclear Plant (SQN) site specific terminology. The headings for ISTS 3.6.10 include the parenthetical expression (Ice Condenser). This identifying information is not included in the SQN ITS. This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.10 is renumbered as ITS 3.6.8.

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. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. ISTS SR 3.6.10.1, SR 3.6.10.2, and SR 3.6.10.3 (ITS SR 3.6.8.1, SR 3.6.8.2, and SR 3.6.8.3, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequencies for ITS SR 3.6.8.1, SR 3.6.8.2, and SR 3.6.8.3 are "In accordance with the Surveillance Frequency Control Program."

5. ~~The second part of the LCO has been added to ensure consistency between the LCO, ACTIONS, and Surveillance Requirements. The ISTS LCO, ACTIONS, and do not match up since there is no explicit statement in the LCO requiring at least one hydrogen ignitor to be OPERABLE in each containment region. LCO 3.0.1 requires LCOs to be met during the MODES or other specified conditions in the Applicability. LCO 3.0.2 states that upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met. Currently, if one ignitor is inoperable in each train and the inoperable ignitors are in the same containment region, then the LCO is still met. Thus, ACTION B is not required to be entered since the LCO is still met. Therefore, the inclusion of the second portion of the LCO ensures consistency between the LCO, ACTIONS, and Surveillance Requirements.~~ CSS-035

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.10 Hydrogen Ignition System (HIS) (Ice Condenser)
Mitigation 8 HMS 1

BASES

BACKGROUND

HMS

The HIS reduces the potential for breach of primary containment due to a hydrogen oxygen reaction in post accident environments. The HIS is required by 10 CFR 50.44, "Standards for Combustible Gas Control Systems in Light-Water-Cooled Reactors" (Ref. 1), and Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 2), to reduce the hydrogen concentration in the primary containment following a degraded core accident. The HIS must be capable of handling an amount of hydrogen equivalent to that generated from a metal water reaction involving 75% of the fuel cladding surrounding the active fuel region (excluding the plenum volume).
HMS 1 HMS 3 HMS 1

10 CFR 50.44 (Ref. 1) requires units with ice condenser containments to install suitable hydrogen control systems that would accommodate an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water. The HIS provides this required capability. This requirement was placed on ice condenser units because of their small containment volume and low design pressure (compared with pressurized water reactor dry containments). Calculations indicate that if hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water were to collect in the primary containment, the resulting hydrogen concentration would be far above the lower flammability limit such that, if ignited from a random ignition source, the resulting hydrogen burn would seriously challenge the containment and safety systems in the containment.
HMS 1

HMS

The HIS is based on the concept of controlled ignition using thermal ignitors, designed to be capable of functioning in a post accident environment, seismically supported, and capable of actuation from the control room. A total of [64] ignitors are distributed throughout the various regions of containment in which hydrogen could be released or to which it could flow in significant quantities. The ignitors are arranged in two independent trains such that each containment region has at least two ignitors, one from each train, controlled and powered redundantly so that ignition would occur in each region even if one train failed to energize.
1 68 2 INSERT 1 3

HMS

When the HIS is initiated, the ignitor elements are energized and heat up to a surface temperature ≥ [1700]°F. At this temperature, they ignite the hydrogen gas that is present in the airspace in the vicinity of the ignitor. The HIS depends on the dispersed location of the ignitors so that local pockets of hydrogen at increased concentrations would burn before
1 2 HMS 1

3

INSERT 1

Additional information regarding containment regions and the distribution of hydrogen igniters within each region is contained in UFSAR Section 6.2.5A.

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BASES

BACKGROUND (continued)

reaching a hydrogen concentration significantly higher than the lower flammability limit. Hydrogen ignition in the vicinity of the ignitors is assumed to occur when the local hydrogen concentration reaches [8.0] volume percent (v/o) and results in [85]% of the hydrogen present being consumed. 2 9

APPLICABLE SAFETY ANALYSES

The HMS HIS causes hydrogen in containment to burn in a controlled manner as it accumulates following a degraded core accident (Ref. 2 3). Burning occurs at the lower flammability concentration, where the resulting temperatures and pressures are relatively benign. Without the system, hydrogen could build up to higher concentrations that could result in a violent reaction if ignited by a random ignition source after such a buildup. 1 3

The hydrogen ignitors are not included for mitigation of a Design Basis Accident (DBA) because an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water is far in excess of the hydrogen calculated for the limiting DBA loss of coolant accident (LOCA). The hydrogen ignitors have been shown by probabilistic risk analysis to be a significant contributor to limiting the severity of accident sequences that are commonly found to dominate risk for units with ice condenser containments. The hydrogen Mitigation System ignitors satisfies satisfy Criterion 4 of 10 CFR 50.36(c)(2)(ii). 1 8

LCO

Two HMS HIS trains must be OPERABLE with power from two independent, safety related power supplies. 1

For this unit, an OPERABLE HMS HIS train consists of 33 32 of 34 33 ignitors energized on the train. 1 3

Operation with at least one HMS HIS train ensures that the hydrogen in containment can be burned in a controlled manner. Unavailability of both HMS HIS trains could lead to hydrogen buildup to higher concentrations, which could result in a violent reaction if ignited. The reaction could take place fast enough to lead to high temperatures and overpressurization of containment and, as a result, breach containment or cause containment leakage rates above those assumed in the safety analyses. Damage to safety related equipment located in containment could also occur. INSERT 2 1 4

APPLICABILITY

Requiring OPERABILITY in MODES 1 and 2 for the HMS HIS ensures its immediate availability after safety injection and scram actuated on a LOCA initiation. In the post accident environment, the two HMS HIS trains subsystems are required to control the hydrogen concentration within containment to near its flammability limit of 4.1 volume percent v/o assuming a worst case single failure. This prevents overpressurization of containment and damage to safety related equipment and instruments located within containment. 1 1 7 9

4 **INSERT 2**

Each containment region must contain at least one OPERABLE hydrogen ignitor. This ensures that, assuming a single failure, there is still ignition capability in an adjacent region.

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BASES

APPLICABILITY (continued)

In MODES 3 and 4, both the hydrogen production rate and the total hydrogen production after a LOCA would be significantly less than that calculated for the DBA LOCA. Also, because of the limited time in these MODES, the probability of an accident requiring the ~~HIS~~ HMS is low. Therefore, the ~~HIS~~ HMS is not required in MODES 3 and 4. 1

In MODES 5 and 6, the probability and consequences of a LOCA are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ~~HIS~~ HMS is not required to be OPERABLE in MODES 5 and 6. 1

ACTIONS

A.1 and A.2

With one ~~HIS~~ HMS train inoperable, the inoperable train must be restored to OPERABLE status within 7 days or the OPERABLE train must be verified OPERABLE frequently by performance of SR 3.6.~~10~~ 8 .1. The 7 day Completion Time is based on the low probability of the occurrence of a degraded core event that would generate hydrogen in amounts equivalent to a metal water reaction of 75% of the core cladding, the length of time after the event that operator action would be required to prevent hydrogen accumulation from exceeding this limit, and the low probability of failure of the OPERABLE ~~HIS~~ HMS train. Alternative Required Action A.2, by frequent surveillances, provides assurance that the OPERABLE train continues to be OPERABLE. 1 1 1

B.1

Condition B is one containment region with no OPERABLE hydrogen ignitor. Thus, while in Condition B, or in Conditions A and B simultaneously, there would always be ignition capability in the adjacent containment regions that would provide redundant capability by flame propagation to the region with no OPERABLE ignitors.

Required Action B.1 calls for the restoration of one hydrogen ignitor in each region to OPERABLE status within 7 days. The 7 day Completion Time is based on the same reasons given under Required Action A.1.

C.1

The unit must be placed in a MODE in which the LCO does not apply if the ~~HIS~~ HMS subsystem(s) cannot be restored to OPERABLE status within the associated Completion Time. This is done by placing the unit in at least MODE 3 within 6 hours. The allowed Completion Time of 6 hours is 1

BASES

ACTIONS (continued)

reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.10.1 (8) (1)

This SR confirms that ≥ [32] (33) of 33 (34) hydrogen ignitors can be successfully energized in each train. The ignitors are simple resistance elements. Therefore, energizing provides assurance of OPERABILITY. The allowance of one inoperable hydrogen ignitor is acceptable because, although one inoperable hydrogen ignitor in a region would compromise redundancy in that region, the containment regions are interconnected so that ignition in one region would cause burning to progress to the others (i.e., there is overlap in each hydrogen ignitor's effectiveness between regions). [The Frequency of 92 days has been shown to be acceptable through operating experience. (2) (3) (5)

OR

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

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] (6) (5)

SR 3.6.10.2 (8) (1)

INSERT 3 This SR confirms that the two inoperable hydrogen ignitors allowed by SR 3.6.10.1 (i.e., one in each train) are not in the same containment region. [The Frequency of 92 days is acceptable based on the Frequency of SR 3.6.10.1, which provides the information for performing this SR. (7) (5)

OR

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

7 **INSERT 3**

~~This SR confirms that each containment region contains at least one OPERABLE hydrogen igniter.~~ CSS-036

This SR confirms that the two inoperable hydrogen ignitors allowed by SR 3.6.8.1 (i.e., one in each train) are not in the same containment region which ensures that each containment region contains at least one OPERABLE hydrogen ignitor.

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.6.10.3

A more detailed functional test is performed to verify system OPERABILITY. Each glow plug is visually examined to ensure that it is clean and that the electrical circuitry is energized. All ignitors (glow plugs), including normally inaccessible ignitors, are visually checked for a glow to verify that they are energized. Additionally, the surface temperature of each glow plug is measured to be ≥ [1700]°F to demonstrate that a temperature sufficient for ignition is achieved. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

OR

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

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

REFERENCES

1. 10 CFR 50.44.

2. 10 CFR 50, Appendix A, GDC 41.

3. U FSAR, Section [6.2].

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~10~~ 8 Hydrogen ~~Ignition~~ Mitigation System (~~HIS~~ HMS) ~~(Ice Condenser)~~ 1

BASES

BACKGROUND

The ~~HIS~~ HMS reduces the potential for breach of primary containment due to a hydrogen oxygen reaction in post accident environments. The ~~HIS~~ HMS is required by 10 CFR 50.44, "Standards for Combustible Gas Control Systems in Light-Water-Cooled Reactors" (Ref. 1), ~~and Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 2),~~ to reduce the hydrogen concentration in the primary containment following a degraded core accident. The ~~HIS~~ HMS must be capable of handling an amount of hydrogen equivalent to that generated from a metal water reaction involving 75% of the fuel cladding surrounding the active fuel region (excluding the plenum volume). 1 3 1

10 CFR 50.44 (Ref. 1) requires units with ice condenser containments to install suitable hydrogen control systems that would accommodate an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water. The ~~HIS~~ HMS provides this required capability. This requirement was placed on ice condenser units because of their small containment volume and low design pressure (compared with pressurized water reactor dry containments). Calculations indicate that if hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water were to collect in the primary containment, the resulting hydrogen concentration would be far above the lower flammability limit such that, if ignited from a random ignition source, the resulting hydrogen burn would seriously challenge the containment and safety systems in the containment. 1

The ~~HIS~~ HMS is based on the concept of controlled ignition using thermal ignitors, designed to be capable of functioning in a post accident environment, seismically supported, and capable of actuation from the control room. A total of ~~[64]~~ 68 ignitors are distributed throughout the various regions of containment in which hydrogen could be released or to which it could flow in significant quantities. The ignitors are arranged in two independent trains such that each containment region has at least two ignitors, one from each train, controlled and powered redundantly so that ignition would occur in each region even if one train failed to energize. INSERT 1 1 2 3

When the ~~HIS~~ HMS is initiated, the ignitor elements are energized and heat up to a surface temperature ≥ ~~[~~1700~~]~~°F. At this temperature, they ignite the hydrogen gas that is present in the airspace in the vicinity of the ignitor. The ~~HIS~~ HMS depends on the dispersed location of the ignitors so that local pockets of hydrogen at increased concentrations would burn before 1 2 1

3 **INSERT 1**

Additional information regarding containment regions and the distribution of hydrogen igniters within each region is contained in UFSAR Section 6.2.5A.

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BASES

BACKGROUND (continued)

reaching a hydrogen concentration significantly higher than the lower flammability limit. Hydrogen ignition in the vicinity of the ignitors is assumed to occur when the local hydrogen concentration reaches ~~[~~8.0~~]~~ volume percent ~~(v/o)~~ and results in ~~[~~85~~]~~% of the hydrogen present being consumed. (2) (9)

APPLICABLE SAFETY ANALYSES

The ~~HIS~~ HMS causes hydrogen in containment to burn in a controlled manner as it accumulates following a degraded core accident (Ref. ~~3~~ 2). Burning occurs at the lower flammability concentration, where the resulting temperatures and pressures are relatively benign. Without the system, hydrogen could build up to higher concentrations that could result in a violent reaction if ignited by a random ignition source after such a buildup. (1) (3)

The hydrogen ignitors are not included for mitigation of a Design Basis Accident (DBA) because an amount of hydrogen equivalent to that generated from the reaction of 75% of the fuel cladding with water is far in excess of the hydrogen calculated for the limiting DBA loss of coolant accident (LOCA). The hydrogen ignitors have been shown by probabilistic risk analysis to be a significant contributor to limiting the severity of accident sequences that are commonly found to dominate risk for units with ice condenser containments. The Hydrogen ~~ignitors~~ Mitigation System satisf~~y~~ies Criterion 4 of 10 CFR 50.36(c)(2)(ii). (1) (8)

LCO

Two ~~HIS~~ HMS trains must be OPERABLE with power from two independent, safety related power supplies. (1)

For this unit, an OPERABLE ~~HIS~~ HMS train consists of ~~32~~ 33 of ~~33~~ 34 ignitors energized on the train. (1) (3)

Operation with at least one ~~HIS~~ HMS train ensures that the hydrogen in containment can be burned in a controlled manner. Unavailability of both ~~HIS~~ HMS trains could lead to hydrogen buildup to higher concentrations, which could result in a violent reaction if ignited. The reaction could take place fast enough to lead to high temperatures and overpressurization of containment and, as a result, breach containment or cause containment leakage rates above those assumed in the safety analyses. Damage to safety related equipment located in containment could also occur. (1)

INSERT 2 (4)

APPLICABILITY

Requiring OPERABILITY in MODES 1 and 2 for the ~~HIS~~ HMS ensures its immediate availability after safety injection and scram actuated on a LOCA initiation. In the post accident environment, the two ~~HIS~~ HMS ~~subsystems~~ trains are required to control the hydrogen concentration within containment to near its flammability limit of 4.1 ~~v/o~~ volume percent assuming a worst case single failure. This prevents overpressurization of containment and damage to safety related equipment and instruments located within containment. (1) (1) (7) (9)

4 **INSERT 2**

Each containment region must contain at least one OPERABLE hydrogen ignitor. This ensures that, assuming a single failure, there is still ignition capability in an adjacent region.

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BASES

APPLICABILITY (continued)

In MODES 3 and 4, both the hydrogen production rate and the total hydrogen production after a LOCA would be significantly less than that calculated for the DBA LOCA. Also, because of the limited time in these MODES, the probability of an accident requiring the ~~HIS~~ HMS is low. Therefore, the ~~HIS~~ HMS is not required in MODES 3 and 4. 1

In MODES 5 and 6, the probability and consequences of a LOCA are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ~~HIS~~ HMS is not required to be OPERABLE in MODES 5 and 6. 1

ACTIONS

A.1 and A.2

With one ~~HIS~~ HMS train inoperable, the inoperable train must be restored to OPERABLE status within 7 days or the OPERABLE train must be verified OPERABLE frequently by performance of SR 3.6.~~10~~ 8.1. The 7 day Completion Time is based on the low probability of the occurrence of a degraded core event that would generate hydrogen in amounts equivalent to a metal water reaction of 75% of the core cladding, the length of time after the event that operator action would be required to prevent hydrogen accumulation from exceeding this limit, and the low probability of failure of the OPERABLE ~~HIS~~ HMS train. Alternative Required Action A.2, by frequent surveillances, provides assurance that the OPERABLE train continues to be OPERABLE. 1

B.1

Condition B is one containment region with no OPERABLE hydrogen ignitor. Thus, while in Condition B, or in Conditions A and B simultaneously, there would always be ignition capability in the adjacent containment regions that would provide redundant capability by flame propagation to the region with no OPERABLE ignitors.

Required Action B.1 calls for the restoration of one hydrogen ignitor in each region to OPERABLE status within 7 days. The 7 day Completion Time is based on the same reasons given under Required Action A.1.

C.1

The unit must be placed in a MODE in which the LCO does not apply if the ~~HIS~~ HMS subsystem(s) cannot be restored to OPERABLE status within the associated Completion Time. This is done by placing the unit in at least MODE 3 within 6 hours. The allowed Completion Time of 6 hours is 1

BASES

ACTIONS (continued)

reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.10.1 8 1

This SR confirms that ≥ [32] 33 of 33 34 hydrogen ignitors can be successfully energized in each train. The ignitors are simple resistance elements. Therefore, energizing provides assurance of OPERABILITY. The allowance of one inoperable hydrogen ignitor is acceptable because, although one inoperable hydrogen ignitor in a region would compromise redundancy in that region, the containment regions are interconnected so that ignition in one region would cause burning to progress to the others (i.e., there is overlap in each hydrogen ignitor's effectiveness between regions). [The Frequency of 92 days has been shown to be acceptable through operating experience. 2 3 5

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 6 5

SR 3.6.10.2 8 1

INSERT 3 This SR confirms that the two inoperable hydrogen ignitors allowed by SR 3.6.10.1 (i.e., one in each train) are not in the same containment region. [The Frequency of 92 days is acceptable based on the Frequency of SR 3.6.10.1, which provides the information for performing this SR. 7 5

OR

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

7

INSERT 3

~~This SR confirms that each containment region contains at least one OPERABLE hydrogen igniter.~~

CSS-036

This SR confirms that the two inoperable hydrogen ignitors allowed by SR 3.6.8.1 (i.e., one in each train) are not in the same containment region which ensures that each containment region contains at least one OPERABLE hydrogen ignitor.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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

6 5

SR 3.6.10.3 8 1

A more detailed functional test is performed to verify system OPERABILITY. Each glow plug is visually examined to ensure that it is clean and that the electrical circuitry is energized. All ignitors (glow plugs), including normally inaccessible ignitors, are visually checked for a glow to verify that they are energized. Additionally, the surface temperature of each glow plug is measured to be ≥ [1700]°F to demonstrate that a temperature sufficient for ignition is achieved. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

7 2 5

OR

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

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

6 5

REFERENCES

1. 10 CFR 50.44.

2. 10 CFR 50, Appendix A, GDC 41. 3

2 U 3. FSAR, Section [6.2]. 3 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.8 BASES, HYDROGEN MITIGATION SYSTEM (HMS)

1. The ISTS 3.6.10 title "Hydrogen Ignition System" has been changed to "Hydrogen Mitigation System" consistent with the Sequoyah Nuclear Plant (SQN) site specific terminology. The headings for ISTS 3.6.10 include the parenthetical expression (Ice Condenser). This identifying information is not included in the SQN ITS. This information is provided in NUREG-1431, Rev. 4, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.10 is renumbered as ITS 3.6.8.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

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

4. Changes are made to be consistent with changes made to the Specification.

5. ISTS SR 3.6.10.1, SR 3.6.10.2, and SR 3.6.10.3 (ITS SR 3.6.8.1, SR 3.6.8.2, and SR 3.6.8.3, respectively) Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency basis description which is being removed will be included in the Surveillance Frequency Control Program.

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

7. Changes are made to be consistent with the Specification.

8. Editorial/grammatical error corrected.

9. The abbreviation (v/o) has been removed from the Bases, as it is not used at SQN.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.8, HYDROGEN MITIGATION SYSTEM (HMS)

There are no specific No Significant Hazards Considerations for this Specification.

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ATTACHMENT 9

ITS 3.6.9, VACUUM RELIEF VALVES

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

ITS A01 ITS 3.6.9

CONTAINMENT SYSTEMS

3/4.6.6 VACUUM RELIEF LINES

LIMITING CONDITION FOR OPERATION

LCO 3.6.9 3.6.6 Three primary containment vacuum relief lines shall be OPERABLE.*

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

ACTION:

ACTION A / ACTION B: With one primary containment vacuum relief line inoperable, restore the line 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

SR 3.6.9.1 4.6.6.1 No additional surveillance requirements other than those required by ~~Specification 4.0.5~~ the Inservice Testing Program. A02

* ~~Refer to LCO 3.6.3 if one or more containment vacuum relief isolation or containment vacuum relief valves are incapable of performing a containment isolation function.~~ A03

CONTAINMENT SYSTEMS

3/4.6.6 VACUUM RELIEF LINES

LIMITING CONDITION FOR OPERATION

LCO 3.6.9 3.6.6 The primary containment vacuum relief lines shall be OPERABLE.*

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

ACTION:

ACTION A
ACTION B

With one primary containment vacuum relief line inoperable, restore the line 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

SR 3.6.9.1 4.6.6.1 No additional surveillance requirements other than those required by ~~Specification 4.0.5~~ the Inservice Testing Program. A02

~~* Refer to LCO 3.6.3 if one or more containment vacuum relief isolation or containment vacuum relief valves are incapable of performing a containment isolation function.~~ A03

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DISCUSSION OF CHANGES
ITS 3.6.9, VACUUM RELIEF VALVES

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 4.6.6.1 requires no additional Surveillance Requirements on the primary containment vacuum relief lines other than those required by Specification 4.0.5. ITS SR 3.6.9.1 requires verification that each vacuum relief line is OPERABLE in accordance with the Inservice Testing Program with a Frequency of in accordance with the Inservice Testing Program. This changes the CTS by stating vacuum relief line testing is performed in accordance with the Inservice Testing Program, and that the Frequency is in accordance with the Inservice Testing Program.

The purpose of CTS 4.6.6.1 is to verify each vacuum relief line is tested in accordance with Specification 4.0.5, which provides the requirements for the Inservice Testing Program. This change is acceptable, because the Frequency regarding the vacuum relief line testing remains the same. The inservice testing requirements of CTS 4.0.5 have been moved 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 a technical change to the CTS.

A03 CTS 3.6.6 LCO contains a footnote * stating "Refer to LCO 3.6.3 if one or more containment vacuum relief isolation or containment vacuum relief valves are incapable of performing a containment isolation function." ITS 3.6.9 does not contain this Note. This changes the CTS by not including a footnote in the ITS that was included in the CTS.

The purpose of CTS footnote * is to alert the user that the vacuum relief isolation valves or the vacuum relief valves also have containment isolation functions. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative as it incorporates an ITS convention with no technical change to the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

DISCUSSION OF CHANGES
ITS 3.6.9, VACUUM RELIEF VALVES

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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

CTS

3.6 CONTAINMENT SYSTEMS

3.6.12 9 Vacuum Relief Valves (Atmospheric and Ice Condenser) 1

3.6.6 LCO 3.6.12 9 [Two] Three vacuum relief lines shall be OPERABLE. 1 2

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A. One vacuum relief line inoperable.	A.1 Restore vacuum relief line 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
4.6.6.1 SR 3.6.12.1 9 Verify each vacuum relief line is OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program 1

3.6 CONTAINMENT SYSTEMS

3.6.~~12~~ 9 Vacuum Relief Valves ~~(Atmospheric and Ice Condenser)~~ 1

3.6.6 LCO 3.6.~~12~~ 9 ~~[Two]~~ Three vacuum relief lines shall be OPERABLE. 1 2

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

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
ACTION	A. One vacuum relief line inoperable.	A.1	Restore vacuum relief line to OPERABLE status.	72 hours
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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.6.1	SR 3.6.~~12~~ 9.1	Verify each vacuum relief line is OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program	1

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.9, VACUUM RELIEF VALVES

1. The headings for ISTS 3.6.12 include the parenthetical expression (Atmospheric and Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7), the Hydrogen Mixing System (ISTS 3.6.9), and the Iodine Cleanup System (ISTS 3.6.11). Therefore, ISTS 3.6.7, ISTS 3.6.9, and ISTS 3.6.11 are not included in the SQN ITS and ISTS 3.6.12 is renumbered as ITS 3.6.9.

2. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. 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.

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

1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.12 Vacuum Relief Valves (Atmospheric and Ice Condenser)

9 1

BASES

BACKGROUND

The purpose of the vacuum relief lines is to protect the containment vessel against negative pressure (i.e., a lower pressure inside than outside). Excessive negative pressure inside containment can occur if there is an inadvertent actuation of containment cooling features, such as the Containment Spray System. Multiple equipment failures or human errors are necessary to cause inadvertent actuation of these systems. 2

, the Air Return System, or both

three

The containment pressure vessel contains two 100% vacuum relief lines that protect the containment from excessive external loading. 3

INSERT 1

[For this facility, the characteristics of the vacuum relief valves and their locations in the containment pressure vessel are as follows:] 4

APPLICABLE SAFETY ANALYSES

Design of the vacuum relief lines involves calculating the effect of inadvertent actuation of containment cooling features, which can reduce the atmospheric temperature (and hence pressure) inside containment (Ref. 1). Conservative assumptions are used for all the relevant parameters in the calculation; for example, for the Containment Spray System, the minimum spray water temperature, maximum initial containment temperature, maximum spray flow, all spray trains operating, etc. The resulting containment pressure versus time is calculated, including the effect of the opening of the vacuum relief lines when their negative pressure setpoint is reached. It is also assumed that one valve fails to open.

0.5

The containment was designed for an external pressure load equivalent to [-2.5] psig. The inadvertent actuation of the containment cooling features was analyzed to determine the resulting reduction in containment pressure. The initial pressure condition used in this analysis was [-0.3] psig. This resulted in a minimum pressure inside containment of [-2.0] psig, which is less than the design load. 4 4

0.49 psi less than annulus pressure

0.1 psi less than annulus pressure

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

The vacuum relief valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

4 **INSERT 1**

containment vessel

vessel vacuum relief

The vacuum relief system has three identical lines located on the dome, at the same elevation, and 120° apart. Each line contains a vacuum relief valve in series with a containment isolation valve, the vacuum relief valve being outside of the isolation valve. The lines are installed such that there is sufficient space between the vacuum relief system and the Shield Building to prevent contact during seismic or pressure transient motion and to allow for an adequate airflow path. CSS-037

Each containment vessel vacuum relief valve is a 24 inch, self-actuated, horizontally installed, swing-disc valve, with an elastomer seat. The seat material will withstand post-LOCA temperature, pressure, and radiation conditions. Each line has a design airflow rate of 28 pounds per second at a pressure differential of 0.5 psid across the entire line. Each normally closed vacuum relief valve is equipped with limit switches so that open and closed positions of the valve are indicated in the main control room. The opening of any of these valves is indicated in the main control room. The valves begin opening at a containment external pressure differential of 0.1 psid and will be fully open in 2.2 seconds for a vacuum relief system design basis event.

Each containment vessel vacuum relief isolation valve is a pneumatically operated butterfly valve with an elastomer seat. The valve, including seat material, will withstand post-LOCA temperature, pressure, and radiation conditions. Two separate trains of control air supplies are available to the two independent solenoid valves which power the isolation valve. The isolation valve, which is normally open, fails open, and will close when containment high pressure reaches the set pressure of 1.5 psid. The high pressure signal is developed from either of two independent sets of three pressure sensors and is completely independent of other containment isolation signals for other systems. Each isolation valve is equipped with a limit switch so that open and closed positions are indicated in the main control room.

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1

BASES

LCO	The LCO establishes the minimum equipment required to accomplish the vacuum relief function following the inadvertent actuation of containment cooling features. Two 100% vacuum relief lines are required to be OPERABLE to ensure that at least one is available, assuming one or both valves in the other line fail to open. [Three] [two are] [vacuum relief valve fails] 3
APPLICABILITY	In MODES 1, 2, 3, and 4, the containment cooling features, such as the Containment Spray System, [and the Air Return System] are required to be OPERABLE to mitigate the effects of a DBA. Excessive negative pressure inside containment could occur whenever these systems are required to be OPERABLE due to inadvertent actuation of these systems. Therefore, the vacuum relief lines are required to be OPERABLE in MODES 1, 2, 3, and 4 to mitigate the effects of inadvertent actuation of the Containment Spray System, Quench Spray (QS) System, or Containment Cooling [Air Return] System. [, or both] 5 2 In MODES 5 and 6, the probability and consequences of a DBA are reduced due to the pressure and temperature limitations of these MODES. The Containment Spray System, QS System, and Containment Cooling [Air Return] System are not required to be OPERABLE in MODES 5 and 6. Therefore, maintaining OPERABLE vacuum relief valves is not required in MODE 5 or 6. 2
ACTIONS	<u>A.1</u> When one of the required vacuum relief lines is inoperable, the inoperable line must be restored to OPERABLE status within 72 hours. The specified time period is consistent with other LCOs for the loss of one train of a system required to mitigate the consequences of a LOCA or other DBA. <u>B.1 and B.2</u> If the vacuum relief line cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

SURVEILLANCE REQUIREMENTS	9 SR 3.6.~~12~~.1 1 This SR cites the Inservice Testing Program, which establishes the requirement that inservice testing of the ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with the ASME Code (Ref. 2). Therefore, SR Frequency is governed by the Inservice Testing Program.
REFERENCES	U 1. FSAR, Section [6.2]. 2 4 2. ASME Code for Operation and Maintenance of Nuclear Power Plants.

1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.12 Vacuum Relief Valves (Atmospheric and Ice Condenser)

9 1

BASES

BACKGROUND

The purpose of the vacuum relief lines is to protect the containment vessel against negative pressure (i.e., a lower pressure inside than outside). Excessive negative pressure inside containment can occur if there is an inadvertent actuation of containment cooling features, such as the Containment Spray System, the Air Return System, or both. Multiple equipment failures or human errors are necessary to cause inadvertent actuation of these systems. 2

The containment pressure vessel contains ~~two~~ three ~~100%~~ vacuum relief lines that protect the containment from excessive external loading. 3

~~[For this facility, the characteristics of the vacuum relief valves and their locations in the containment pressure vessel are as follows:]~~ INSERT 1 4

APPLICABLE SAFETY ANALYSES

Design of the vacuum relief lines involves calculating the effect of inadvertent actuation of containment cooling features, which can reduce the atmospheric temperature (and hence pressure) inside containment (Ref. 1). Conservative assumptions are used for all the relevant parameters in the calculation; for example, for the Containment Spray System, the minimum spray water temperature, maximum initial containment temperature, maximum spray flow, all spray trains operating, etc. The resulting containment pressure versus time is calculated, including the effect of the opening of the vacuum relief lines when their negative pressure setpoint is reached. It is also assumed that one valve fails to open.

The containment was designed for an external pressure load equivalent to ~~[-2.5]~~ 0.5 psig. The inadvertent actuation of the containment cooling features was analyzed to determine the resulting reduction in containment pressure. The initial pressure condition used in this analysis was ~~[-0.3] psig~~ 0.1 psi less than annulus pressure. This resulted in a minimum pressure inside containment of ~~[-2.0] psig~~ 0.49 psi less than annulus pressure, which is less than the design load. 4 4

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

The vacuum relief valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

4

INSERT 1

containment vessel

vessel vacuum relief

CSS-037

The vacuum relief system has three identical lines located on the dome, at the same elevation, and 120° apart. Each line contains a vacuum relief valve in series with a containment isolation valve, the vacuum relief valve being outside of the isolation valve. The lines are installed such that there is sufficient space between the vacuum relief system and the Shield Building to prevent contact during seismic or pressure transient motion and to allow for an adequate airflow path.

Each containment vessel vacuum relief valve is a 24 inch, self-actuated, horizontally installed, swing-disc valve, with an elastomer seat. The seat material will withstand post-LOCA temperature, pressure, and radiation conditions. Each line has a design airflow rate of 28 pounds per second at a pressure differential of 0.5 psid across the entire line. Each normally closed vacuum relief valve is equipped with limit switches so that open and closed positions of the valve are indicated in the main control room. The opening of any of these valves is indicated in the main control room. The valves begin opening at a containment external pressure differential of 0.1 psid and will be fully open in 2.2 seconds for a vacuum relief system design basis event.

Each containment vessel vacuum relief isolation valve is a pneumatically operated butterfly valve with an elastomer seat. The valve, including seat material, will withstand post-LOCA temperature, pressure, and radiation conditions. Two separate trains of control air supplies are available to the two independent solenoid valves which power the isolation valve. The isolation valve, which is normally open, fails open, and will close when containment high pressure reaches the set pressure of 1.5 psid. The high pressure signal is developed from either of two independent sets of three pressure sensors and is completely independent of other containment isolation signals for other systems. Each isolation valve is equipped with a limit switch so that open and closed positions are indicated in the main control room.

1

BASES

LCO	The LCO establishes the minimum equipment required to accomplish the vacuum relief function following the inadvertent actuation of containment cooling features. Two 100% vacuum relief lines are required to be OPERABLE to ensure that at least one is available, assuming one or both valves in the other line fail to open. Three two are vacuum relief valve fails 3
APPLICABILITY	In MODES 1, 2, 3, and 4, the containment cooling features, such as the Containment Spray System, are required to be OPERABLE to mitigate the effects of a DBA. Excessive negative pressure inside containment could occur whenever these systems are required to be OPERABLE due to inadvertent actuation of these systems. Therefore, the vacuum relief lines are required to be OPERABLE in MODES 1, 2, 3, and 4 to mitigate the effects of inadvertent actuation of the Containment Spray System, Quench Spray (QS) System, or Containment Cooling System. and the Air Return System 5 , or both Air Return 2 In MODES 5 and 6, the probability and consequences of a DBA are reduced due to the pressure and temperature limitations of these MODES. The Containment Spray System, QS System, and Containment Cooling System are not required to be OPERABLE in MODES 5 and 6. Therefore, maintaining OPERABLE vacuum relief valves is not required in MODE 5 or 6. Air Return 2
ACTIONS	A.1 When one of the required vacuum relief lines is inoperable, the inoperable line must be restored to OPERABLE status within 72 hours. The specified time period is consistent with other LCOs for the loss of one train of a system required to mitigate the consequences of a LOCA or other DBA. B.1 and B.2 If the vacuum relief line cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.6.~~12~~ 9 .1 This SR cites the Inservice Testing Program, which establishes the requirement that inservice testing of the ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with the ASME Code (Ref. 2). Therefore, SR Frequency is governed by the Inservice Testing Program. 1
REFERENCES	1. U FSAR, Section ~~[~~6.2~~]~~. 2 4 2. ASME Code for Operation and Maintenance of Nuclear Power Plants.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.9 BASES, VACUUM RELIEF VALVES

1. The headings for ISTS 3.6.12 include the parenthetical expression (Atmospheric and Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in NUREG-1431, Rev. 4.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7), the Hydrogen Mixing System (ISTS 3.6.9), and the Iodine Cleanup System (ISTS 3.6.11). Therefore, ISTS 3.6.7, ISTS 3.6.9, and ISTS 3.6.11 are not included in the SQN ITS and ISTS 3.6.12 is renumbered as ITS 3.6.9.

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

3. Changes are made to be consistent with changes made to the Specification.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

5. Editorial changes made to provide clarification and to correct grammar.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.9, VACUUM RELIEF VALVES

There are no specific No Significant Hazards Considerations for this Specification.

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ATTACHMENT 10

Air Cleanup Subsystem

ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

CSS-041

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

ITS A01 ITS 3.6.10

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS - CLEANUP SUBSYSTEM

Air Cleanup Subsystem CSS-041

LIMITING CONDITION FOR OPERATION

LCO 3.6.10 — 3.6.1.8 Two independent emergency gas treatment system cleanup subsystems (EGTS) shall be OPERABLE. [trains] LA01

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

ACTION: [EGTS Air Cleanup Subsystem] CSS-041

ACTION A / ACTION B — With one EGTS cleanup subsystem [train] inoperable, restore the inoperable subsystem [train] to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. LA01

SURVEILLANCE REQUIREMENTS

4.6.1.8 Each EGTS cleanup subsystem [train] shall be demonstrated OPERABLE: LA01

[In accordance with the Surveillance Frequency Control Program] LA02

SR 3.6.10.1 — a. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 10 hours [15 continuous minutes] with the heaters on. L03 LA03 L04

SR 3.6.10.5 — b. At least once per 18 months [on a STAGGERED TEST BASIS] or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by: L01 CSS-039

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Position C.5.a., C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm ± 10%. See ITS 5.5.9

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.

SR 3.6.10.5 — 3. Verifying a system flow rate of 4000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1975. See ITS 5.5.9

SR 3.6.10.2 — [Add proposed SR 3.6.10.2] A02

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CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%. See ITS 5.5.9

SR 3.6.10.3 SR 3.6.10.4 d. ~~At least once per 18 months by~~: In accordance with the Surveillance Frequency Control Program LA02

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5 inches Water Gauge while operating the filter train at a flow rate of 4000 cfm ± 10%. See ITS 5.5.9

SR 3.6.10.3 2. Verifying that the filter train starts on an actual or simulated ~~a Phase A containment isolation Test~~ Signal. L02 LA01

SR 3.6.10.4 3. Verify the operation of the filter cooling bypass valves.

SR 3.6.10.6 4. Verifying that each system produces a negative pressure of greater than or equal to 0.5 inches W. G. in the annulus within 1 minute after a start signal. INSERT 1 ~~See ITS 3.6.7~~ L05

CET003

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm ± 10%. See ITS 5.5.9

3.6.10

CET003

INSERT 1

L05

~~on a STAGGERED TEST BASIS for each EGTS Air Cleanup Subsystem train~~

In accordance with the Surveillance Frequency Control Program

LA02

CONTAINMENT SYSTEMS

CONTAINMENT VENTILATION SYSTEM (DELETED)

LIMITING CONDITION FOR OPERATION

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ITS

A01

ITS 3.6.10

SHIELD BUILDING INTEGRITY

1.30 SHIELD BUILDING INTEGRITY shall exist when:

See ITS Chapter 1.0

a. The door in each access opening is closed except when the access opening is being used for normal transit entry and exit.

See ITS 3.6.7

LCO 3.6.10 b. The emergency gas treatment system is OPERABLE.

c. The sealing mechanism associated with each penetration (e.g., welds, bellows or 0-rings) is OPERABLE.

See ITS 3.6.7

SHUTDOWN MARGIN

1.31 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all full length rod cluster assemblies (shutdown and control) are fully inserted except for the single rod cluster assembly of highest reactivity worth which is assumed to be fully withdrawn.

SITE BOUNDARY

1.32 The SITE BOUNDARY shall be that line beyond which the land is not owned, leased, or otherwise controlled by the licensee.

SOLIDIFICATION

1.33 Deleted

See ITS Chapter 1.0

SOURCE CHECK

1.34 Deleted

STAGGERED TEST BASIS

1.35 A STAGGERED TEST BASIS shall consist of:

a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals,

b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

THERMAL POWER

1.36 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

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ITS A01 ITS 3.6.10

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS - ~~CLEANUP SUBSYSTEM~~ Air Cleanup Subsystem

CSS-041

LIMITING CONDITION FOR OPERATION

LCO 3.6.10 — 3.6.1.8 Two ~~independent~~ emergency gas treatment system ~~cleanup subsystems~~ (EGTS) trains shall be OPERABLE. LA01

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

ACTION: CSS-041 EGTS Air Cleanup Subsystem

ACTION A, ACTION B — With one ~~EGTS cleanup subsystem~~ train inoperable, restore the inoperable ~~subsystem~~ train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. LA01

SURVEILLANCE REQUIREMENTS

4.6.1.8 Each ~~EGTS cleanup subsystem~~ train shall be demonstrated OPERABLE: LA01 In accordance with the Surveillance Frequency Control Program LA02

SR 3.6.10.1 a. ~~At least once per 31 days~~ ~~on a STAGGERED TEST BASIS~~ ~~by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and~~ verifying that the system operates for at least ~~10 hours~~ 15 continuous minutes with the heaters on. L03 LA03 L04

SR 3.6.10.5 b. ~~At least once per 18 months~~ ~~on a STAGGERED TEST BASIS~~ or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by: ~~L01~~ CSS-039

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Position C.5.a., C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm ± 10%.

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%.

See ITS 5.5.9

SR 3.6.10.5 — 3. Verifying a system flow rate of 4000 cfm ± 10% during system operation when tested in accordance with ANSI N510-1975. See ITS 5.5.9

SR 3.6.10.2 — Add proposed SR 3.6.10.2 A02

ITS

A01

ITS 3.6.10

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%. See ITS 5.5.9

SR 3.6.10.3
SR 3.6.10.4

d. ~~At least once per 18 months by~~: [In accordance with the Surveillance Frequency Control Program] LA02

1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 5 inches Water Gauge while operating the filter train at a flow rate of 4000 cfm + 10%. See ITS 5.5.9

SR 3.6.10.3 2. Verifying that the filter train starts on [an actual or simulated] ~~a Phase A containment isolation Test~~ Signal. L02 LA01

SR 3.6.10.4 3. Verify the operation of the filter cooling bypass valves.

SR 3.6.10.6 4. Verifying that each system produces a negative pressure of greater than or equal to 0.5 inches W.G. in the annulus within 1 minute after a start signal. [INSERT 1] L05 ~~See ITS 3.6.7~~

CET003

e. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm + 10%.

f. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm + 10%.

See ITS 5.5.9

INSERT 1 L05

CET003

~~on a STAGGERED TEST BASIS for each EGTS Air Cleanup Subsystem train~~

In accordance with the Surveillance Frequency Control Program LA02

ITS

A01

ITS 3.6.10

CONTAINMENT SYSTEMS

CONTAINMENT VENTILATION SYSTEM (DELETED)

LIMITING CONDITION FOR OPERATION

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ITS

A01

ITS 3.6.10

DEFINITIONS

RATED THERMAL POWER (RTP)

1.27 RATED THERMAL POWER (RTP) shall be a total reactor core heat transfer rate to the reactor coolant of 3455 MWt.

REACTOR TRIP SYSTEM (RTS) RESPONSE TIME

1.28 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its (RTS) trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by NRC.

See ITS Chapter 1.0

REPORTABLE EVENT

1.29 DELETED

SHIELD BUILDING INTEGRITY

1.30 SHIELD BUILDING INTEGRITY shall exist when:

See ITS Chapter 1.0

CET003

a. The door in each access opening is closed except when the access opening is being used for normal transit entry and exit.

See ITS 3.6.7

LCO 3.6.10

b. The emergency gas treatment system is OPERABLE.

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

See ITS 3.6.7

SHUTDOWN MARGIN

1.31 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming all full length rod cluster assemblies (shutdown and control) are fully inserted except for the single rod cluster assembly of highest reactivity worth which is assumed to be fully withdrawn.

See ITS Chapter 1.0

SITE BOUNDARY

1.32 The SITE BOUNDARY shall be that line beyond which the land is not owned, leased, or otherwise controlled by the licensee.

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DISCUSSION OF CHANGES
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS) Air Cleanup Subsystem

CSS-041

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 4.6.1.8.b.1, CTS 4.6.1.8.b.2, CTS 4.6.1.8.c, CTS 4.6.1.8.d.1, CTS 4.6.1.8.e, and CTS 4.6.1.8.f provide filter testing requirements for the EGTS. ITS SR 3.6.10.2 requires performance of EGTS filter testing in accordance with the Ventilation Filter Testing Program (VFTP) at a frequency in accordance with the VFTP. CTS does not include a VFTP, but the requirements that make up the VFTP are being moved to ITS 5.5. This changes the CTS by requiring testing in accordance with the VFTP, whose requirements are being moved to ITS 5.5.

This change is acceptable because filter testing requirements are being moved to the VFTP as part of ITS 5.5, and ITS SR 3.6.10.2 references the VFTP for performing these tests. This change is designated as administrative because it does not result in a technical change the CTS.

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

EGTS Air Cleanup Subsystem

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.1.8 states that two "independent" emergency gas treatment system cleanup subsystems shall be OPERABLE. ITS 3.6.10 requires two ~~emergency gas treatment system~~ trains to be OPERABLE, but does not include the details of what constitutes OPERABILITY. CTS 4.6.1.8.d.2 requires each Emergency Gas Treatment System (EGTS) filter train to start on a Phase A containment isolation test signal. ITS SR 3.6.10.3 requires verification that each ~~EGTS~~ train actuates on an actual or simulated actuation signal. This changes the CTS by moving the detail that the "cleanup subsystem" portion of EGTS must be "independent" to the Bases. This also changes the CTS by moving the detail that the EGTS trains are actuated on a "Phase A containment isolation" signal to

DISCUSSION OF CHANGES
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

Air Cleanup Subsystem

CSS-041

the Bases. The additional allowance to test EGTS train actuation on an actual or simulated actuation signal is discussed in DOC L02.

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 retains the requirement that two emergency gas treatment system trains shall be OPERABLE, and verifies that each train starts on a valid signal. 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 the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change, because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.1.8 requires each EGTS cleanup subsystem to be operated for at least 10 hours with the heaters on at least once per 31 days. ITS SR 3.6.10.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.1.8.b.3 requires, in part, verification of each EGTS cleanup subsystem flow rate every 18 months. ITS SR 3.6.10.5 requires the same verification and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.1.8.d.2 requires verification that each EGTS cleanup subsystem filter train starts on a Phase A containment isolation Test signal at least once per 18 months. ITS SR 3.6.10.3 requires a similar verification and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.1.8.d.3 requires verification that the EGTS cleanup subsystem filter cooling bypass valves operate at least one per 18 months. ITS SR 3.6.10.4 requires a similar verification and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

CET003

INSERT 2

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated

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INSERT 2

CET003

CTS 4.6.1.8.d.4 requires verification that each EGTS Air Cleanup Subsystem train produces a negative pressure within limits in the annulus within 1 minute after a start signal. ITS SR 3.6.10.6 requires a similar verification and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." The change to CTS 4.6.1.8.d.4 to perform the Surveillance on a STAGGERED TEST BASIS is discussed in DOC L05.

DISCUSSION OF CHANGES
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

Air Cleanup Subsystem

as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA03 *(Type 4 – Removal of LCO, SR, or other TS Requirements to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* CTS 4.6.1.8.a requires each EGTS cleanup subsystem to be operated for a specified time with the heaters on, and specifies that flow through the HEPA filters and charcoal adsorbers be initiated from the control room. ITS SR 3.6.10.1 includes the surveillance to operate each ~~EGTS~~ train for a specified time with the heaters on, but does not include the requirement that flow through the HEPA filters and charcoal adsorbers be initiated from the control room. This changes the CTS by moving the requirement that flow through the HEPA filters and charcoal adsorbers be initiated from the control room to the TS Bases.

CSS-041

EGTS Air Cleanup Subsystem

The removal of these details, that are related to methods of surveillance test performance, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirements for operating each ~~EGTS~~ train for a specified time with the heaters on. In addition, 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 Specifications Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to methods of surveillance test performance is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 ~~*(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.6.1.8.b.3 requires each EGTS cleanup subsystem flowrate to be verified within limits at least once per 18 months. ITS 3.6.10.5 requires a similar test; however, it is required to be performed using one EGTS train every 18 months "on a STAGGERED TEST BASIS." This changes the CTS by requiring the test to be performed using each EGTS train at least once per 36 months.~~

Not Used

~~The purpose of CTS 4.6.1.8.b.3 is to ensure each EGTS train produces the required flow rate. This change is acceptable because the new Surveillance provides an acceptable level of reliability. This proposed Surveillance Frequency will continue to require the test every 18 months. This will ensure that each EGTS train can produce the required flow rate. ITS SR 3.6.10.3 requires performance of a test to ensure that each EGTS train actuates on an actual or simulated initiation signal. Therefore, each train will continue to be tested to ensure it can be automatically aligned to the correct mode of operation; however, the verification that the system flow rate is within limits will only be required with one train in operation each 18 months. This change is designated as less restrictive because the Surveillance will only be required to be performed on one EGTS train every 18 months instead of on both EGTS trains.~~

CSS-039

DISCUSSION OF CHANGES
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS) Air Cleanup Subsystem

CSS-041

L02 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.6.1.8.d.2 requires that each Emergency Gas Treatment System (EGTS) filter train starts on a Phase A containment isolation test signal. ITS SR 3.6.10.3 requires verification that each ~~EGTS~~ EGTS Air Cleanup Subsystem train actuates on 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 purpose of CTS 4.6.1.8.d.2 is to ensure the ~~EGTS~~ EGTS Air Cleanup Subsystem actuates upon receipt of ~~a~~ Phase A containment isolation signal. This change is acceptable, because it has been determined that the current Surveillance Requirement acceptance criteria are not the only method that can be used for verification that the equipment used to meet the LCO can perform its required functions. Equipment cannot 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 actuation if sufficient information is collected to satisfy the Surveillance test requirements. The change also allows a simulated signal to be used, if necessary. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L03 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.8.1.8.a requires each EGTS cleanup subsystem to be demonstrated OPERABLE by verifying that the system operates for at least 10 hours with the heaters on, at a Frequency of at least once per 31 days on a STAGGERED TEST BASIS. ITS SR 3.6.10.1 requires a similar verification of each ~~EGTS~~ EGTS Air Cleanup Subsystem train at a Frequency of "in accordance with the Surveillance Frequency Control Program." The discussion of moving the Surveillance Frequency to the Surveillance Frequency Control Program as discussed in DOC LA02. This changes the CTS by deleting the requirement to test on a STAGGERED TEST BASIS.

The purpose of CTS 4.8.1.8.a is to ensure each ~~EGTS~~ EGTS Air Cleanup Subsystem train is OPERABLE and that moisture on the associated adsorbers and HEPA filters is eliminated. CTS 1.35, STAGGERED TEST BASIS definition, defines a testing schedule for n systems, subsystems, or trains by dividing the specified test interval into n equal subintervals, with the testing of one system, subsystem, or train occurring at the beginning of each subinterval. In other words, a Surveillance Requirement to verify the OPERABILITY of each train in a two train system at a Frequency of 31 days on a STAGGERED TEST BASIS would result in each train being verified OPERABLE every 31 days, with one train being verified in alternating 15.5 day subintervals. Removal of the STAGGERED TEST BASIS scheduling requirement does not change the requirement to verify the OPERABLILITY of each train every 31 days, but rather removes the requirement to schedule testing every 15.5 days. The new Surveillance Frequency will not change the testing Frequency of each train. The intent of the current staggered testing requirement is to evenly distribute testing of each train across the system. However, as each train of EGTS is independent, no increase in reliability or safety is achieved by evenly staggering the testing subintervals. This change is acceptable because removal of the staggered testing requirement will increase operational and scheduling flexibility without decreasing safety or system reliability. This change is designated as less restrictive, because the intervals between performances of

DISCUSSION OF CHANGES
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS) Air Cleanup Subsystem

the Surveillances for the two fans can be larger or smaller under the ITS than under the CTS.

L04 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.6.1.8.a requires the periodic operation of each ~~EGTS~~ train for at least 10 hours with the heaters on. ITS SR 3.6.10.1 requires the periodic operation of each ~~EGTS~~ train for at least 15 continuous minutes with the heaters on. This changes the CTS by reducing the amount of time each ~~EGTS~~ train is required to be operated. EGTS Air Cleanup Subsystem

CSS-041

~~The purpose of CTS 4.6.1.8.a is to periodically verify that each train of EGTS can operate properly. The requirement to operate each train for at least 10 hours per month with the heaters on in order to reduce the buildup of moisture on the adsorbers and HEPA filters was derived from the guidance provided in Regulatory Guide (RG) 1.52, "Design, Testing, and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants," Revision 2, Regulatory Position 4.d. However, this was changed in RG 1.52, Revision 3. RG 1.52, Revision 3, Regulatory Position 6.1 states, "Each ESF atmosphere cleanup train should be operated continuously for at least 15 minutes each month, with the heaters on (if so equipped), to justify the operability of the system and all its components." The Ventilation Filter Testing Program (VFTP) also requires that a laboratory test of a sample of the charcoal adsorber used in each of the Engineered Safety Features (ESF) systems be tested in accordance with ASTM D3803-1989. Generic Letter 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999, informed licensees that the use of any standard other than ASTM D3803-1989 to test the charcoal sample may result in an overestimation of the capability of the charcoal to adsorb radioiodine. As a result, TVA requested license amendments to the Sequoyah Nuclear Plant (SQN) Unit 1 and Unit 2 Technical Specifications to revise the required filter testing to be in accordance with ASTM D3803-1989. The NRC approved the SQN Unit 1 and Unit 2 license amendments on November 2, 2000 (ADAMS Accession Number ML003766942). This change is acceptable because the ASTM D3803-1989 Standard no longer requires operation for 10 hours utilizing the heaters.~~ This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

CET003

INSERT 3

SQN is adopting TSTF-522. TSTF-522 revises Surveillance Requirements which currently require operating systems with the heaters operating for a continuous 10 hour period at a frequency controlled in accordance with the SFCP. The Surveillance Requirements are revised to require operation of the systems for 15 continuous minutes at a frequency controlled in accordance with the SFCP.

TVA has reviewed the model safety evaluation dated September 20, 2012, as part of the Federal Register Notice for Comment. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-522. TVA has concluded that the justifications presented in the TSTF-522 proposal and the model safety evaluation prepared by the NRC staff are applicable to SQN, Units 1 and 2 and justify this amendment for the incorporation of the changes to the SQN TS.

CSS-040

TVA is proposing the following variations from the TS changes described in the TSTF-522, Revision 0.

The SQN, Unit 1 and Unit 2, TSs utilize different numbering and titles than the Standard Technical Specifications on which TSTF-522 was based. Specifically, STS 3.6.13 in NUREG-1431 covers the Shield Building Air Cleanup System (SBACS) whereas SQN ITS 3.6.10 covers the Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem. Additionally, consistent with the bracketed, plant-specific options in the NRC's model safety evaluation, the proposed amendment retains the allowance to apply the SFCP to the surveillance Frequencies. These differences are administrative and do not affect the applicability of TSTF-522 to the SQN, Unit 1 and Unit 2 TSs.

INSERT 3 CET003

L05 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS 4.6.1.8.d.4 requires a drawdown of the shield building annulus by each EGTS Air Cleanup Subsystem train to within limits at least once per 18 months. ITS SR 3.6.10.6 requires a drawdown of the shield building annulus to within limits "In accordance with the Surveillance Frequency Control Program." The specified Surveillance Frequency that is being moved to the Surveillance Frequency Control Program is "18 months on a STAGGERED TEST BASIS for each EGTS Air Cleanup Subsystem train." This changes the CTS by allowing the drawdown test for each EGTS Air Cleanup Subsystem train to be performed less frequently. Moving the specified Surveillance Frequency to the Surveillance Frequency Control Program is discussed in DOC LA02.

The purpose of CTS 4.6.1.8.d.4 is to verify the integrity of the shield building boundary by ensuring the shield building annulus can be rapidly drawn to a negative pressure of at least 0.5 inches water gauge. Therefore, this is a test of shield building integrity and does not need to be performed every 18 months using each EGTS Air Cleanup Subsystem train. Staggering use of the EGTS Air Cleanup Subsystem trains every 18 months will ensure both trains are capable of performing the test. This change is acceptable because performing the drawdown test using one train of EGTS Air Cleanup Subsystem every 18 months will adequately verify shield building integrity. OPERABILITY of the EGTS Air Cleanup Subsystem will be maintained through the application of the other Surveillances of ITS 3.6.10. This change is designated as less restrictive, because the shield building annulus drawdown Surveillance will be performed less frequently with each EGTS Air Cleanup Subsystem train under the ITS than under the CTS.

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

CTS

EGTS Air Cleanup Subsystem

SBACS (Dual and Ice Condenser) EGTS

3.6.13 10

1

3.6 CONTAINMENT SYSTEMS

3.6.13 10 Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser) Emergency Gas Treatment System (EGTS)

Air Cleanup Subsystem

1

3.6.1.8 LCO 3.6.13 10 Two SBACS EGTS trains shall be OPERABLE.

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

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EGTS Air Cleanup Subsystem

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action	A. One SBACS EGTS train inoperable.	A.1 Restore SBACS EGTS train to OPERABLE status.	7 days	1
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	
4.6.1.8.a	SR 3.6.13.1 10	Operate each SBACS EGTS train for [≥ 10 15 continuous hours minutes [with heaters operating or (for systems without heaters) ≥ 15 minutes].	[31 days 1 OR In accordance with the Surveillance Frequency Control Program]	3 4 TSTF-522
DOC A02	SR 3.6.13.2 10	Perform required SBACS EGTS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP	1

EGTS Air Cleanup Subsystem

CTS

CSS-041

SBACS (Dual and Ice Condenser) EGTS Air Cleanup Subsystem EGTS

3.6.13 10 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
4.6.1.8.d.2	SR 3.6.13.3 10	Verify each SBACS EGTS train actuates on an actual or simulated actuation signal.	[[18] months 1 4 OR In accordance with the Surveillance Frequency Control Program] 4
4.6.1.8.d.3	SR 3.6.13.4 10	[Verify each SBACS EGTS filter cooling bypass damper valve can be opened operated. EGTS Air Cleanup Subsystem	[[18] months 1 3 4 OR In accordance with the Surveillance Frequency Control Program]] 4
4.6.1.8.b.3	SR 3.6.13.5 10	Verify each SBACS EGTS train flow rate is ≥ [ ] ≥ 3600 and ≤ 4400 cfm.	[[18] months on a STAGGERED TEST BASIS 3 1 4 OR In accordance with the Surveillance Frequency Control Program] 4

CET003

INSERT 1

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5 **INSERT 1**

CET003

4.6.1.8.d.4	SR 3.6.10.6	Verify the shield building can be maintained at a negative pressure ≥ 0.5 inch water gauge in the annulus by one EGTS Air Cleanup Subsystem train within 60 seconds after a start signal.	In accordance with the Surveillance Frequency Control Program

CTS

EGTS Air Cleanup Subsystem

SBACS (Dual and Ice Condenser) EGTS

3.6.13 10

1

3.6 CONTAINMENT SYSTEMS

3.6.13 10 Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser) Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem

1

3.6.1.8 LCO 3.6.13 10 Two SBACS EGTS trains shall be OPERABLE.

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

EGTS Air Cleanup Subsystem

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ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action	A. One SBACS EGTS train inoperable.	A.1 Restore SBACS EGTS train to OPERABLE status.	7 days	1
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	
4.6.1.8.a	SR 3.6.13.1 10	Operate each SBACS EGTS train for [≥ 10 15 continuous hours minutes [with heaters operating or (for systems without heaters) ≥ 15 minutes].	[31 days 1 OR In accordance with the Surveillance Frequency Control Program]	3 4 TSTF-522
DOC A02	SR 3.6.13.2 10	Perform required SBACS EGTS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP	1

EGTS Air Cleanup Subsystem

CTS CSS-041

EGTS Air Cleanup Subsystem ~~SBACS (Dual and Ice Condenser)~~ EGTS

3.6.~~13~~ 10 (1)

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
4.6.1.8.d.2	SR 3.6.~~13~~ 10.3	Verify each ~~SBACS~~ EGTS train actuates on an actual or simulated actuation signal.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	(1) (4) (4)
4.6.1.8.d.3	SR 3.6.~~13~~ 10.4	~~[~~ Verify each ~~SBACS~~ EGTS cooling filter bypass ~~damper~~ valve can be ~~opened~~ operated.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]]~~	(1) (3) (4) (4)
4.6.1.8.b.3	SR 3.6.~~13~~ 10.5	Verify each ~~SBACS~~ EGTS train flow rate is ~~≥ [ ]~~ ≥ 3600 and ≤ 4400 cfm.	~~[[18] months on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	(1) (3) (4) (4)

EGTS Air Cleanup Subsystem

CET003

INSERT 1

(5)

5 **INSERT 1**

CET003

4.6.1.8.d.4	SR 3.6.10.6	Verify the shield building can be maintained at a negative pressure ≥ 0.5 inch water gauge in the annulus by one EGTS Air Cleanup Subsystem train within 60 seconds after a start signal.	In accordance with the Surveillance Frequency Control Program

Air Cleanup Subsystem

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

CSS-041

1. The ISTS 3.6.13 title "Shield Building Air Cleanup System (SBACS)" has been changed to "Emergency Gas Treatment System (EGTS)" consistent with the Sequoyah Nuclear Plant (SQN) site specific terminology. The heading for ISTS 3.6.13 includes the parenthetical expression (Dual and Ice Condenser). This identifying information is not included in the SQN ITS. This information is provided in the NUREG-1431, Rev. 4.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion, but serves no purpose in a plant-specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.13 is renumbered as ITS 3.6.10.

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. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. ISTS SR 3.6.13.1, SR 3.6.13.3, SR 3.6.13.4, and SR 3.6.13.5 (ITS SR 3.6.10.1, SR 3.6.10.3, SR 3.6.10.4, and SR 3.6.10.5, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.10.1, SR 3.6.10.3, SR 3.6.10.4, and SR 3.6.10.5 under the Surveillance Frequency Control Program.

5. ITS SR 3.6.10.6 is added to reflect the requirements of CTS 4.6.1.8.d.4. Changes associated with CTS 4.6.1.8.d.4 are described in Discussion of Changes LA02 and L05. ITS SR 3.6.10.6 is also similar to the requirements of ISTS SR 3.6.8.4 but will not specify a flow rate for the EGTS Cleanup Subsystem train. The current licensing basis for this acceptance criteria is derived from the license amendment requested by TVA and approved by the NRC on December 23, 1982.

CET003

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

CSS-041

EGTS Air Cleanup Subsystem SBACS (Dual and Ice Condenser) EGTS B 3.6.13 10 1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.13 Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser) 10 Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem 1

BASES

EGTS EGTS Air Cleanup Subsystem

BACKGROUND

The SBACS is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1), to ensure that radioactive materials that leak from the primary containment into the shield building (secondary containment) following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment. 1

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

EGTS Air Cleanup Subsystem

INSERT 1 The SBACS establishes a negative pressure in the annulus between the shield building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment. 2

Shield building OPERABILITY is required to ensure retention of primary containment leakage and proper operation of the SBACS. EGTS 1

EGTS Air Cleanup Subsystem EGTS

The SBACS consists of two separate and redundant trains. Each train includes a heater, [cooling coils,] a prefilter, moisture separators, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of radioiodines, and a fan. Ductwork, valves and/or dampers, and instrumentation also form part of the system. The moisture separators function to reduce the moisture content of the airstream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank. Only the upstream HEPA filter and the charcoal adsorber section are credited in the analysis. The system initiates and maintains a negative air pressure in the shield building by means of filtered exhaust ventilation of the shield building following receipt of a safety injection (SI) signal. The system is described in Reference 2. 3 4

Phase A containment isolation

The prefilters remove large particles in the air, and the moisture separators remove entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal absorbers. Heaters may be included to reduce the relative humidity of the airstream on systems that operate in high humidity. Continuous operation of each train, for at least 10 hours per month, with heaters on, reduces moisture buildup on their HEPA filters and adsorbers. [The cooling coils cool the air to keep the charcoal beds from becoming too hot due to absorption of fission product.] TSTF-522 3

2

INSERT 1

CET003

The EGTS design consists of two subsystems ~~common to both units~~. The annulus vacuum control subsystem is used to establish and maintain a negative pressure within the secondary containment annulus during normal plant operation ~~(non safety-related)~~. The annulus vacuum control subsystem does not perform any safety function. The air cleanup subsystem is actuated following a LOCA to maintain a negative pressure in the annulus area between the shield building and the steel containment. Filters in the air cleanup subsystem then control the release of radioactive contaminants to the environment. The air cleanup subsystem is the portion of EGTS that performs a safety function and is required to be OPERABLE. OPERABILITY requirements associated with the shield building are specified in LCO 3.6.7, "Shield Building."

BASES

BACKGROUND (continued)

During normal operation, the Shield Building Cooling System is aligned to bypass the SBACS's HEPA filters and charcoal adsorbers. For SBACS operation following a DBA, however, the bypass dampers automatically reposition to draw the air through the filters and adsorbers. 2

EGTS Air Cleanup Subsystem EGTS

The SBACS reduces the radioactive content in the shield building atmosphere following a DBA. Loss of the SBACS could cause site boundary doses, in the event of a DBA, to exceed the values given in the licensing basis. EGTS 1

EGTS Air Cleanup Subsystem EGTS EGTS Air Cleanup Subsystem

APPLICABLE SAFETY ANALYSES

The SBACS design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 3) assumes that only one train of the SBACS is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the remaining one train of this filtration system. The amount of fission products available for release from containment is determined for a LOCA. EGTS 1

EGTS Air Cleanup Subsystem EGTS a Phase A containment isolation

The modeled SBACS actuation in the safety analyses is based upon a worst case response time following an SI initiated at the limiting setpoint. The total response time, from exceeding the signal setpoint to attaining the negative pressure of [0.5] inch water gauge in the shield building, is [22 seconds]. This response time is composed of signal delay, diesel generator startup and sequencing time, system startup time, and time for the system to attain the required pressure after starting. 60 1 4 3

EGTS

The SBACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1

LCO

EGTS EGTS

In the event of a DBA, one SBACS train is required to provide the minimum particulate iodine removal assumed in the safety analysis. Two trains of the SBACS must be OPERABLE to ensure that at least one train will operate, assuming that the other train is disabled by a single active failure. 1

APPLICABILITY

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

CSS-041 EGTS Air Cleanup Subsystem

SBACS (Dual and Ice Condenser) EGTS

B 3.6.13 10 1

BASES

APPLICABILITY (continued)

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

ACTIONS

A.1

EGTS Air Cleanup Subsystem EGTS 1

With one SBACS train inoperable, the inoperable train must be restored to OPERABLE status within 7 days. The components in this degraded condition are capable of providing 100% of the iodine removal needs after a DBA. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SBACS train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs. EGTS 1

EGTS Air Cleanup Subsystem

B.1 and B.2

EGTS 1

If the SBACS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. EGTS Air Cleanup Subsystem

SURVEILLANCE REQUIREMENTS

SR 3.6.13.1 10 1 2 5

EGTS INSERT 2

Operating each SBACS train for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. For systems with heaters, operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours eliminates moisture on the adsorbers and HEPA filters. Experience from filter testing at operating units indicates that the 10 hour period is adequate for moisture elimination on the adsorbers and HEPA filters. [The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls, the two train redundancy available, and the iodine removal capability of the Containment Spray System. TSTF-522 6

2 **INSERT 2**

from the Control Room with flow through the HEPA filters and charcoal adsorbers

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CSS-041 EGTS Air Cleanup Subsystem SBACS (Dual and Ice Condenser) EGTS B 3.6.13 10 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR 6

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 7

10 EGTS Air Cleanup Subsystem

SR 3.6.13.2 1

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

10 EGTS Air Cleanup Subsystem

SR 3.6.13.3 1

The automatic startup ensures that each SBACS EGTS train responds properly. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the SR interval was developed considering that the SBACS equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.13.1. 6

OR

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

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EGTS Air Cleanup Subsystem EGTS SBACS (Dual and Ice Condenser)

B 3.6.~~13~~ 10 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~------]~~ 7

~~[~~ SR 3.6.~~13~~.4 10 1

EGTS Air Cleanup Subsystem EGTS cooling valves

The ~~SBACS~~ filter bypass ~~dampers~~ are tested to verify OPERABILITY. 5

INSERT 3 ~~The dampers are in the bypass position during normal operation and must reposition for accident operation to draw air through the filters.~~
~~[The [18] month Frequency is considered to be acceptable based on damper reliability and design, mild environmental conditions in the vicinity of the dampers, and the fact that operating experience has shown that the dampers usually pass the Surveillance when performed at the [18] month Frequency.~~

~~OR~~ 6

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

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~------]]~~ 7

SR 3.6.~~13~~.5 10 1

The proper functioning of the fans, dampers, filters, adsorbers, etc., as a system is verified by the ability of each train to produce the required system flow rate. ~~[The [18] month Frequency on a STAGGERED TEST BASIS is consistent with Regulatory Guide 1.52 (Ref. 4) guidance for functional testing.~~

~~OR~~ 6

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

5 **INSERT 3**

The ability to cool the filters and adsorbers in an inactive air cleanup unit is accomplished with two crossover flow ducts that draw a small stream of air from the active air cleanup unit through the inactive air cleanup unit. The valves in the inactive train automatically receive a signal to open. The capability to manually open the suction valve for the inactive train and align to the affected unit is provided in the main control room to complete the flow path through the inactive unit.

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EGTS Air Cleanup Subsystem

SBACS (Dual and Ice Condenser) EGTS

B 3.6.13 10

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

CET003

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

INSERT 4

7

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REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. U FSAR, Section [6.5] 6.2.
3. U FSAR, Chapter [15].
4. Regulatory Guide 1.52, Revision [2].

1

3

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5 **INSERT 4**

CET003

SR 3.6.10.6

The EGTS Air Cleanup Subsystem produces a negative pressure to prevent leakage from the shield building. This Surveillance verifies that the shield building can be rapidly drawn down to - 0.5 inch water gauge in the annulus. This test is used to ensure shield building boundary integrity. Establishment of this pressure is confirmed by this SR, which demonstrates that the shield building can be drawn down to a negative pressure of ≥ 0.5 inches of water gauge in the annulus in ≤ 60 seconds using one EGTS Air Cleanup Subsystem train. The time limit ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. Since this Surveillance is a shield building boundary integrity test, it does not need to be performed with each EGTS Air Cleanup Subsystem train; thus, this Surveillance is performed on a STAGGERED TEST BASIS. The primary purpose of this SR is to ensure shield building integrity. The secondary purpose of this SR is to ensure that the EGTS Air Cleanup Subsystem train being tested functions as designed. Upon failure to meet this SR, the leak tightness of the shield building must be immediately assessed to determine the impact on the OPERABILITY of the shield building. If a negative pressure of ≥ 0.5 inch water gauge cannot be maintained in the annulus by either EGTS Air Cleanup Subsystem train (i.e., loss of shield building safety function), the shield building must be declared inoperable and ACTIONS of LCO 3.6.7 performed in accordance with LCO 3.0.6 and Specification 5.5.13, “Safety Function Determination Program (SFDP).”

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

CSS041

SBACS (Dual and Ice Condenser) EGTS Air Cleanup Subsystem EGTS B 3.6.13 10

B 3.6 CONTAINMENT SYSTEMS

B 3.6.13 10 Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser) Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem

BASES EGTS EGTS Air Cleanup Subsystem

BACKGROUND

The SBACS is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1), to ensure that radioactive materials that leak from the primary containment into the shield building (secondary containment) following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

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

INSERT 1 The SBACS establishes a negative pressure in the annulus between the shield building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment. Shield building OPERABILITY is required to ensure retention of primary containment leakage and proper operation of the SBACS. EGTS Air Cleanup Subsystem EGTS

The SBACS EGTS consists of two separate and redundant trains. Each train includes a heater, [cooling coils,] a prefilter, moisture separators, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of radioiodines, and a fan. Ductwork, valves and/or dampers, and instrumentation also form part of the system. The moisture separators function to reduce the moisture content of the airstream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank. Only the upstream HEPA filter and the charcoal adsorber section are credited in the analysis. The system initiates and maintains a negative air pressure in the shield building by means of filtered exhaust ventilation of the shield building following receipt of a safety injection (SI) Phase A containment isolation signal. The system is described in Reference 2.

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

1 1 1 2 1 3 4 TSTF-522 3

2 **INSERT 1**

CET003

The EGTS design consists of two subsystems ~~common to both units~~. The annulus vacuum control subsystem is used to establish and maintain a negative pressure within the secondary containment annulus during normal plant operation ~~(non safety-related)~~. The annulus vacuum control subsystem does not perform any safety function. The air cleanup subsystem is actuated following a LOCA to maintain a negative pressure in the annulus area between the shield building and the steel containment. Filters in the air cleanup subsystem then control the release of radioactive contaminants to the environment. The air cleanup subsystem is the portion of EGTS that performs a safety function and is required to be OPERABLE. OPERABILITY requirements associated with the shield building are specified in LCO 3.6.7, "Shield Building."

BASES

BACKGROUND (continued)

During normal operation, the Shield Building Cooling System is aligned to bypass the SBACS's HEPA filters and charcoal adsorbers. For SBACS operation following a DBA, however, the bypass dampers automatically reposition to draw the air through the filters and adsorbers. 2

EGTS Air Cleanup Subsystem EGTS EGTS

The SBACS reduces the radioactive content in the shield building atmosphere following a DBA. Loss of the SBACS could cause site boundary doses, in the event of a DBA, to exceed the values given in the licensing basis. 1

EGTS Air Cleanup Subsystem EGTS EGTS

APPLICABLE SAFETY ANALYSES

The SBACS design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 3) assumes that only one train of the SBACS is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the remaining one train of this filtration system. The amount of fission products available for release from containment is determined for a LOCA. 1

EGTS Air Cleanup Subsystem EGTS a Phase A containment isolation

The modeled SBACS actuation in the safety analyses is based upon a worst case response time following an SI initiated at the limiting setpoint. The total response time, from exceeding the signal setpoint to attaining the negative pressure of [0.5] inch water gauge in the shield building, is [22 seconds]. This response time is composed of signal delay, diesel generator startup and sequencing time, system startup time, and time for the system to attain the required pressure after starting. 1 4 3

60

EGTS

The SBACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1

EGTS EGTS

LCO

In the event of a DBA, one SBACS train is required to provide the minimum particulate iodine removal assumed in the safety analysis. Two trains of the SBACS must be OPERABLE to ensure that at least one train will operate, assuming that the other train is disabled by a single active failure. 1

APPLICABILITY

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

BASES

APPLICABILITY (continued)

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

ACTIONS

A.1

EGTS Air Cleanup Subsystem EGTS

With one SBACS train inoperable, the inoperable train must be restored to OPERABLE status within 7 days. The components in this degraded condition are capable of providing 100% of the iodine removal needs after a DBA. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SBACS EGTS train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs. 1 1

B.1 and B.2

EGTS Air Cleanup Subsystem EGTS

If the SBACS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. 1

SURVEILLANCE REQUIREMENTS

SR 3.6.13.1 10

EGTS Air Cleanup Subsystem EGTS INSERT 2

Operating each SBACS train for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. For systems with heaters, operation with the heaters on (automatic heater cycling to maintain temperature) for ≥ 10 continuous hours eliminates moisture on the adsorbers and HEPA filters. Experience from filter testing at operating units indicates that the 10 hour period is adequate for moisture elimination on the adsorbers and HEPA filters. [The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls, the two train redundancy available, and the iodine removal capability of the Containment Spray System. 1 2 5 TSTF-522 6

(2) **INSERT 2**

from the Control Room with flow through the HEPA filters and charcoal adsorbers

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CSS-041 EGTS Air Cleanup Subsystem EGTS SBACS (Dual and Ice Condenser) B 3.6.13 10 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR 6

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 7

10 EGTS Air Cleanup Subsystem

SR 3.6.13.2

EGTS

This SR verifies that the required SBACS filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP. 1

10 EGTS Air Cleanup Subsystem

SR 3.6.13.3

EGTS

The automatic startup ensures that each SBACS train responds properly. 1
[The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the SR interval was developed considering that the SBACS equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.13.1.

OR 6

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

CSS-041

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

7

10

[SR 3.6.13.4

1

EGTS Air Cleanup Subsystem

EGTS cooling valves

The SBACS filter bypass dampers are tested to verify OPERABILITY.

INSERT 3

The dampers are in the bypass position during normal operation and must reposition for accident operation to draw air through the filters.

5

[The [18] month Frequency is considered to be acceptable based on damper reliability and design, mild environmental conditions in the vicinity of the dampers, and the fact that operating experience has shown that the dampers usually pass the Surveillance when performed at the [18] month Frequency.

OR

6

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

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

7

10

SR 3.6.13.5

1

The proper functioning of the fans, dampers, filters, adsorbers, etc., as a system is verified by the ability of each train to produce the required system flow rate. [The [18] month Frequency on a STAGGERED TEST BASIS is consistent with Regulatory Guide 1.52 (Ref. 4) guidance for functional testing.

OR

6

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

5 **INSERT 3**

The ability to cool the filters and adsorbers in an inactive air cleanup unit is accomplished with two crossover flow ducts that draw a small stream of air from the active air cleanup unit through the inactive air cleanup unit. The valves in the inactive train automatically receive a signal to open. The capability to manually open the suction valve for the inactive train and align to the affected unit is provided in the main control room to complete the flow path through the inactive unit.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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

CET003

INSERT 4

7 5

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. U FSAR, Section [6.5] 6.2.
3. U FSAR, Chapter [15].
4. Regulatory Guide 1.52, Revision [2].

1 3

5

INSERT 4

CET003

SR 3.6.10.6

The EGTS Air Cleanup Subsystem produces a negative pressure to prevent leakage from the shield building. This Surveillance verifies that the shield building can be rapidly drawn down to - 0.5 inch water gauge in the annulus. This test is used to ensure shield building boundary integrity. Establishment of this pressure is confirmed by this SR, which demonstrates that the shield building can be drawn down to a negative pressure of ≥ 0.5 inches of water gauge in the annulus in ≤ 60 seconds using one EGTS Air Cleanup Subsystem train. The time limit ensures that no significant quantity of radioactive material leaks from the shield building prior to developing the negative pressure. Since this Surveillance is a shield building boundary integrity test, it does not need to be performed with each EGTS Air Cleanup Subsystem train; thus, this Surveillance is performed on a STAGGERED TEST BASIS. The primary purpose of this SR is to ensure shield building integrity. The secondary purpose of this SR is to ensure that the EGTS Air Cleanup Subsystem train being tested functions as designed. Upon failure to meet this SR, the leak tightness of the shield building must be immediately assessed to determine the impact on the OPERABILITY of the shield building. If a negative pressure of ≥ 0.5 inch water gauge cannot be maintained in the annulus by either EGTS Air Cleanup Subsystem train (i.e., loss of shield building safety function), the shield building must be declared inoperable and ACTIONS of LCO 3.6.7 performed in accordance with LCO 3.0.6 and Specification 5.5.13, "Safety Function Determination Program (SFDP)."

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

Air Cleanup Subsystem

CSS-041

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.10 BASES, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

1. The ISTS 3.6.13 title "Shield Building Air Cleanup System (SBACS)" has been changed to "Emergency Gas Treatment System (EGTS)" consistent with the Sequoyah Nuclear Plant (SQN) site specific terminology. The heading for ISTS 3.6.13 includes the parenthetical expression (Dual and Ice Condenser). This identifying information is not included in the SQN ITS. This information is provided in the NUREG-1431, Rev. 4.0 to assist in identifying the appropriate Specifications to be used as a model for a plant-specific ITS conversion, but serves no purpose in a plant-specific implementation. In addition, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.13 is renumbered as ITS 3.6.10.

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

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

Air Cleanup Subsystem

4. SQN design of EGTS actuation is on a Phase A containment isolation signal.

5. Changes have been made to be consistent with changes made to the Specification.

6. ISTS SR 3.6.13.1, SR 3.6.13.3, SR 3.6.13.4, and SR 3.6.13.5 (ITS SR 3.6.10.1, SR 3.6.10.3, SR 3.6.10.4, and SR 3.6.10.5, respectively) provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.10.1, SR 3.6.10.2, SR 3.6.10.3, SR 3.6.10.4, and SR 3.6.10.5 under the Surveillance Frequency Control Program.

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

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Specific No Significant Hazards Considerations (NSHCs)

Air Cleanup Subsystem

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

CSS-041

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 11

ITS 3.6.11, AIR RETURN SYSTEM

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

ITS A01 3.6.11

CONTAINMENT SYSTEMS

CONTAINMENT AIR RETURN FANS System (ARS) A01

LIMITING CONDITION FOR OPERATION

LCO 3.6.11 3.6.5.6 Two independent containment air return fans shall be OPERABLE. system trains CSS-042 A01 LA01

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

ACTION: system train train Insert New A02

ACTION A With one containment air return fan inoperable, restore the inoperable fan 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. A01

ACTION B

SURVEILLANCE REQUIREMENTS

SR 3.6.11.1, SR 3.6.11.2, SR 3.6.11.3 4.6.5.6 Each containment air return system fan shall be demonstrated OPERABLE: A01

a. At least once per 92 days on a STAGGERED TEST BASIS by: L02

SR 3.6.11.2 1. Verifying that the fan motor current is 32 ± 7.5 amps with the backdraft dampers closed, and

SR 3.6.11.3 2. Verifying that with the fan off, the air return system fan damper opens when a torque of less than or equal to 68.1 inch-pounds is appied to the counterweight.

SR 3.6.11.1 b. At least once per 18 months by verifying that the air return system fan starts on an auto-start actual or simulated signal after a 10 ± 1 minute delay and operates for at least 15 minutes. L01

In accordance with the Surveillance Frequency Control Program LA02

ITS 3.6.11

A01

CONTAINMENT SYSTEMS

CONTAINMENT AIR RETURN FANS System (ARS) A01

LIMITING CONDITION FOR OPERATION A01

LCO 3.6.11 3.6.5.6 Two independent containment air return fans shall be OPERABLE. system trains CSS-042 LA01

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

Insert New A02

ACTION: system train train

ACTION A / ACTION B With one containment air return fan inoperable, restore the inoperable fan 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. A01

SURVEILLANCE REQUIREMENTS

SR 3.6.11.1, SR 3.6.11.2, SR 3.6.11.3 4.6.5.6 Each containment air return system fan shall be demonstrated OPERABLE: A01

a. At least once per 92 days on a STAGGERED TEST BASIS by: L02

SR 3.6.11.2 1. Verifying that the fan motor current is 32 ± 7.5 amps with the backdraft dampers closed, and

SR 3.6.11.3 2. verifying that with the fan off, the air return system fan damper opens when a torque of less than or equal to 68.1 inch-pounds is applied to the counterweight.

SR 3.6.11.1 b. At least once per 18 months by verifying that the air return system fan starts on an auto-start actual or simulated signal after a 10 ± 1 minute delay and operates for at least 15 minutes. L01

In accordance with the Surveillance Frequency Control Program LA02

DISCUSSION OF CHANGES
ITS 3.6.11, AIR RETURN SYSTEM

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

Insert New A02 CSS-042

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.5.6 states that two "independent" containment air return fans shall be OPERABLE. ITS 3.6.11 requires two containment air return ~~fans~~ system trains to be OPERABLE, but does not include the details of what constitutes OPERABILITY. This changes the CTS by moving the detail that the fans 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 air return system ~~fans~~ trains 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 in Chapter 5. This program provides for the evaluation of changes to the Bases 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. CSS-042

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.5.6.a.1 requires verification of the air return fan motor current with the backdraft dampers closed at least once per 92 days. ITS SR 3.6.11.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.6.a.2 requires verification of the air return fan damper opening torque with the air

NEW DOC A02

CTS 3.6.5.6 and 3.6.5.6 ACTION refer to the air return system (ARS) as being divided into two fans. ITS 3.6.11, and ACTION A refer to the ARS as being divided into two trains. This changes the CTS by exchanging the word “fan(s)” for the word “train(s)”. CSS-042

This change is acceptable because UFSAR Section 6.6.2 states, “The design of the fans and controls of each 100 percent capacity system meets the intent of Regulatory Guides 1.29 and 1.53.” UFSAR Section 6.6.3 states, “Two 100 percent capacity air return systems are provided. Thus if one fan should fail, the other will provide the necessary air flow from the upper to lower containment.” This change is designated as administrative because it does not result in any technical changes to the CTS.

DISCUSSION OF CHANGES
ITS 3.6.11, AIR RETURN SYSTEM

return fan off at least once per 92 days. ITS SR 3.6.11.3 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.6.b requires verification of air return fan start on an auto-start signal (after a specified delay) and fan operation (for a specified duration) at least once per 18 months. ITS SR 3.6.11.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for the SRs and the Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.5.6.b requires verification of the start of the air return fan on an "auto-start" signal. ITS SR 3.6.11.1 specifies that the signal may be from either an "actual" or simulated (i.e., test) signal. This changes the CTS by explicitly allowing the use of either an actual or simulated signal for the test.

The purpose of CTS 4.6.5.6.b is to ensure the air return fans start upon receipt of 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. Equipment cannot discriminate between an "actual," "simulated," or "test" signal. 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 actuation, if sufficient information is collected to satisfy the Surveillance test requirements. The change also allows a simulated signal to be used, if necessary. This change is designated as less restrictive, because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L02 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.6.5.6.a requires each air return fan to be demonstrated OPERABLE by verifying the fan motor

DISCUSSION OF CHANGES
ITS 3.6.11, AIR RETURN SYSTEM

current is within limits with the backdraft dampers closed, and verifying that with the fan off, the air return fan damper opens with an applied torque within the specified limits. Each of these verifications is performed at a Frequency of at least once per 92 days on a STAGGERED TEST BASIS. ITS SR 3.6.11.2 and SR 3.6.11.3 require similar verifications of each air return fan at a Frequency of "in accordance with the Surveillance Frequency Control Program." The Surveillance Frequencies being moved to the Surveillance Frequency Control Program are 92 days. The discussion of moving the Surveillance Frequencies to the Surveillance Frequency Control Program as discussed in DOC LA02. This changes the CTS by deleting the requirement to test on a STAGGERED TEST BASIS.

system

CSS-042

The purpose of CTS 4.6.5.6.a is to ensure each air return fan is OPERABLE and available to assist in providing the required heat removal capability to limit post accident conditions to less than the containment design values. CTS 1.35, STAGGERED TEST BASIS definition, defines a testing schedule for n systems, subsystems, or trains by dividing the specified test interval into n equal subintervals, with the testing of one system, subsystem, or train occurring at the beginning of each subinterval. In other words, a Surveillance Requirement to verify the OPERABILITY of each fan in a two fan system at a Frequency of 92 days on a STAGGERED TEST BASIS would result in each fan being verified OPERABLE every 92 days, with one fan being verified in alternating 46 day subintervals. Removal of the STAGGERED TEST BASIS scheduling requirement does not change the requirement to verify the OPERABLILITY of each fan every 92 days, but rather removes the requirement to schedule testing every 46 days. The new Surveillance Frequency will not change the testing Frequency of each fan. The intent of the current staggered testing requirement is to evenly distribute testing of each fan within the system. However, as each air return fan is independent, no increase in reliability or safety is achieved by evenly staggering the testing subintervals. This change is acceptable because removal of the staggered testing requirement will increase operational and scheduling flexibility without decreasing safety or system reliability. This change is designated as less restrictive, because the intervals between performances of the Surveillances for the two fans can be larger or smaller under the ITS than under the CTS.

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

 1

3.6 CONTAINMENT SYSTEMS

3.6.14 11 Air Return System (ARS) (Ice Condenser) 1

3.6.5.6 LCO 3.6.14 11 Two ARS trains fans shall be OPERABLE. 1 3

stet

CSS-042

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION	A. One ARS train fan inoperable.	A.1 Restore ARS train fan to OPERABLE status.	72 hours	3
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	
4.6.5.6.b	SR 3.6.14.1 11	Verify each ARS fan starts on an actual or simulated actuation signal, after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes.	[[92] days OR In accordance with the Surveillance Frequency Control Program]	1 4 5 5

CTS

ARS (Ice Condenser) ①
3.6.14 [11]

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.6.a.1	SR 3.6.14.2 [11]	Verify, with the ARS fan dampers closed, each ARS fan motor current is ≥ [20.5] [24.5] amps and ≤ [35.5] [39.5] amps [when the fan speed is ≥ [840] rpm and ≤ [900] rpm].	[92 days OR In accordance with the Surveillance Frequency Control Program	① ④ ⑤
4.6.5.6.a.2	SR 3.6.14.3 [11]	Verify, with the ARS fan not operating, each ARS fan damper opens when ≤ [11.0] lb [68.1 in-lb of torque] is applied to the counterweight.	[92 days OR In accordance with the Surveillance Frequency Control Program]	① ④ ⑤ ⑤
	SR 3.6.14.4	[Verify each motor operated valve in the hydrogen collection header that is not locked, sealed, or otherwise secured in position, opens on an actual or simulated actuation signal after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes.	[92 days OR In accordance with the Surveillance Frequency Control Program]]	⑥

CTS

ARS (Ice Condenser) 1
3.6.14 11

3.6 CONTAINMENT SYSTEMS

3.6.14 11 Air Return System (ARS) (Ice Condenser) 1

3.6.5.6 LCO 3.6.14 11 Two ARS trains fans shall be OPERABLE. 1 3

stet

CSS-042

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION	A. One ARS train fan inoperable.	A.1 Restore ARS train fan to OPERABLE status.	72 hours	3
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	
4.6.5.6.b	SR 3.6.14.1 11 Verify each ARS fan starts on an actual or simulated actuation signal, after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes.	[[92] days OR In accordance with the Surveillance Frequency Control Program]	1 4 5 5

CTS

ARS (Ice Condenser) 1
3.6.14 11

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.6.a.1	SR 3.6.14.2 (11)	Verify, with the ARS fan dampers closed, each ARS fan motor current is ≥ [20.5] (24.5) amps and ≤ [35.5] (39.5) amps [when the fan speed is ≥ [840] rpm and ≤ [900] rpm].	[92 days OR In accordance with the Surveillance Frequency Control Program	1 4 5
4.6.5.6.a.2	SR 3.6.14.3 (11)	Verify, with the ARS fan not operating, each ARS fan damper opens when ≤ [11.0] lb (68.1 in-lb of torque) is applied to the counterweight.	[92 days OR In accordance with the Surveillance Frequency Control Program]	1 4 5
	SR 3.6.14.4	[Verify each motor operated valve in the hydrogen collection header that is not locked, sealed, or otherwise secured in position, opens on an actual or simulated actuation signal after a delay of ≥ [9.0] minutes and ≤ [11.0] minutes.	[92 days OR In accordance with the Surveillance Frequency Control Program]]	6

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.11, AIR RETURN SYSTEM

1. The heading and title for ISTS 3.6.14 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.14 is renumbered as ITS 3.6.11.

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. ~~ISTS 3.6.14 and ACTION A refer to ARS "train" or "trains." However, the SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans." This is acceptable since the common hydrogen collection headers are passive components and are not susceptible to an active failure.~~ Not Used CSS-042

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

5. ISTS SR 3.6.14.1, SR 3.6.14.2, and SR 3.6.14.3 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.11.1, SR 3.6.11.2, and SR 3.6.11.3 under the Surveillance Frequency Control Program.

6. ISTS SR 3.6.14.4 requires verification that each motor operated valve in the hydrogen collection header that is not locked, sealed, or otherwise secured in position, opens on an actual or simulated actuation signal after the specified delay. However, the SQN Air Return System hydrogen collection headers do not include motor operated valves (or dampers) that receive actuation signals. Therefore, this surveillance is unnecessary and has not been included in the SQN ITS.

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~14~~ 11 Air Return System (ARS) ~~(Ice Condenser)~~ 1

BASES

BACKGROUND

The ARS is designed to assure the rapid return of air from the upper to the lower containment compartment after the initial blowdown following a Design Basis Accident (DBA). The return of this air to the lower compartment and subsequent recirculation back up through the ice condenser assists in cooling the containment atmosphere and limiting post accident pressure and temperature in containment to less than design values. Limiting pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

The ARS provides post accident hydrogen mixing in selected areas of containment. ~~The associated Hydrogen Skimmer System consists of~~ 2
are
hydrogen collection headers routed to potential hydrogen pockets in containment, terminating on the suction side of either of the two ARS fans ~~at the header isolation valves~~. The minimum design flow from each 2
potential hydrogen pocket is sufficient to limit the local concentration of hydrogen.

stet

CSS-042

The ARS consists of two separate ~~trains of equal capacity, each capable of meeting the design bases. Each train includes a~~ 100% capacity air 3
s
return fan, associated damper, and hydrogen collection headers ~~with~~ common
~~isolation valves~~. Each ~~train~~ fan is powered from a separate Engineered 2
Safety Features (ESF) bus.

stet

The ARS fans are automatically started ~~and the hydrogen collection header isolation valves are opened~~ by the ~~containment pressure High-High signal~~ Phase B containment isolation signal approximately 10 minutes after the containment pressure reaches the pressure setpoint. The ~~time delay~~ fan backdraft dampers ensures that no energy released during the initial phase of a DBA will bypass the ice bed through the ARS fans ~~or Hydrogen Skimmer System~~. 2

After starting, the fans displace air from the upper compartment to the lower compartment, thereby returning the air that was displaced by the high energy line break blowdown from the lower compartment ~~and equalizing pressures throughout containment~~. After discharge into the lower compartment, air flows with steam produced by residual heat through the ice condenser doors into the ice condenser compartment where the steam portion of the flow is condensed. The air flow returns to the upper compartment through the top deck doors in the upper portion of the ice condenser compartment. The ARS fans operate continuously after actuation, circulating air through the containment volume and 2

1

BASES

BACKGROUND (continued)

purging all potential hydrogen pockets in containment. ~~When the containment pressure falls below a predetermined value, the ARS fans are automatically de-energized. Thereafter, the fans are automatically cycled on and off if necessary to control any additional containment pressure transients.~~

2

The ARS also functions, after all the ice has melted, to circulate any steam still entering the lower compartment to the upper compartment where the Containment Spray System can cool it.

The ARS is an ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. The operation of the ARS, in conjunction with the ice bed, the Containment Spray System, and the Residual Heat Removal (RHR) System spray, provides the required heat removal capability to limit post accident conditions to less than the containment design values.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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, in regard to ESF systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one ~~train each of the~~ Containment Spray System, RHR System, and ARS being inoperable (Ref. 1). The DBA analyses show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure.

CSS-042

stet

~~fan~~ ~~train~~ ~~an~~ 3

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 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. 2).

The analysis for minimum internal containment pressure (i.e., maximum external differential containment pressure) assumes inadvertent simultaneous actuation of both the ARS and the Containment Spray System. The containment vacuum relief valves are designed to accommodate inadvertent actuation of either or both systems.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The modeled ARS actuation from the containment analysis is based upon a response time associated with exceeding the containment pressure High-High signal setpoint to achieving full ARS air flow. ~~A delayed response time initiation provides conservative analyses of peak calculated containment temperature and pressure responses~~ INSERT 1 (2). The ARS total response time of 600 seconds consists of the built in signal delay.

The ARS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). stet CSS-042

LCO

In the event of a DBA, one ~~train of the~~ ARS fan ~~with the Hydrogen Skimmer System~~ is required to provide the minimum air recirculation for heat removal and hydrogen mixing assumed in the safety analyses. To ensure this requirement is met, two ~~trains of the~~ ARS fans ~~with the Hydrogen Skimmer System~~ must be OPERABLE. This will ensure that at least one ~~train~~ fan will operate, assuming the worst case single failure occurs, which is in the ESF power supply. (3)

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the ARS. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ARS is not required to be OPERABLE in these MODES.

ACTIONS

stet CSS-042

A.1

If one ~~of the required trains of the~~ ARS fan is inoperable, it must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the flow ~~and hydrogen skimming~~ needs after an accident. The 72 hour Completion Time was developed taking into account the redundant flow ~~and hydrogen skimming~~ capability of the OPERABLE ARS ~~train~~ fan and the low probability of a DBA occurring in this period. (3) (2)

B.1 and B.2

If the ARS ~~train~~ fan 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 (3)

2 **INSERT 1**

A delayed response time initiation ensures that no energy released during the initial phase of a DBA will bypass the ice bed through the ARS fans.

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1

BASES

ACTIONS (continued)

operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

11

SR 3.6.14.1 1

Verifying that each ARS fan starts on an actual or simulated actuation signal, after a delay ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes is sufficient to ensure that all fans are OPERABLE and that all associated controls and time delays are functioning properly. It also ensures that blockage, fan and/or motor failure, or excessive vibration can be detected for corrective action. [The [92] day Frequency was developed considering the known reliability of fan motors and controls and the two train redundancy available. 4 5

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 6

11

SR 3.6.14.2 1

Verifying ARS fan motor current to be at rated speed with the return air dampers closed confirms one operating condition of the fan. This test is indicative of overall fan motor performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. [The Frequency of 92 days conforms with the testing requirements for similar ESF equipment and considers the known reliability of fan motors and controls and the two train redundancy available. 8 5

OR

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

 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

-----------------------------REVIEWER'S NOTE-----------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 6

11
SR 3.6.14.3 1

Verifying the OPERABILITY of the return air damper provides assurance that the proper flow path will exist when the fan is started. By applying the correct counterweight, the damper operation can be confirmed. [The Frequency of 92 days was developed considering the importance of the dampers, their location, physical environment, and probability of failure. Operating experience has also shown this Frequency to be acceptable. 5

OR

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

-----------------------------REVIEWER'S NOTE-----------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 6

[SR 3.6.14.4

Verifying the OPERABILITY of the motor operated valve in the Hydrogen Skimmer System hydrogen collection header to the lower containment compartment provides assurance that the proper flow path will exist when the valve receives an actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This Surveillance also confirms that the time delay to open is within specified tolerances. [The 92 day Frequency was developed considering the known reliability of the motor operated valves and controls and the two train redundancy available. Operating experience has also shown this Frequency to be acceptable. 7

OR

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

7

REFERENCES

U

1. FSAR, Section [6.2]. 2 4

2. 10 CFR 50, Appendix K.

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1

B 3.6 CONTAINMENT SYSTEMS

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

11

1

BASES

BACKGROUND

The ARS is designed to assure the rapid return of air from the upper to the lower containment compartment after the initial blowdown following a Design Basis Accident (DBA). The return of this air to the lower compartment and subsequent recirculation back up through the ice condenser assists in cooling the containment atmosphere and limiting post accident pressure and temperature in containment to less than design values. Limiting pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

The ARS provides post accident hydrogen mixing in selected areas of containment. The associated Hydrogen Skimmer System consists of hydrogen collection headers routed to potential hydrogen pockets in containment, terminating on the suction side of either of the two ARS fans at the header isolation valves. The minimum design flow from each potential hydrogen pocket is sufficient to limit the local concentration of hydrogen.

are

2

2

stet

CSS-042

The ARS consists of two separate trains of equal capacity, each capable of meeting the design bases. Each train includes a 100% capacity air return fan, associated damper, and hydrogen collection headers with isolation valves. Each train is powered from a separate Engineered Safety Features (ESF) bus.

s

common

fan

3

2

The ARS fans are automatically started and the hydrogen collection header isolation valves are opened by the containment pressure High-High signal 10 minutes after the containment pressure reaches the pressure setpoint. The time delay ensures that no energy released during the initial phase of a DBA will bypass the ice bed through the ARS fans or Hydrogen Skimmer System.

Phase B containment isolation signal approximately

fan backdraft dampers

2

After starting, the fans displace air from the upper compartment to the lower compartment, thereby returning the air that was displaced by the high energy line break blowdown from the lower compartment and equalizing pressures throughout containment. After discharge into the lower compartment, air flows with steam produced by residual heat through the ice condenser doors into the ice condenser compartment where the steam portion of the flow is condensed. The air flow returns to the upper compartment through the top deck doors in the upper portion of the ice condenser compartment. The ARS fans operate continuously after actuation, circulating air through the containment volume and

2

1

BASES

BACKGROUND (continued)

purging all potential hydrogen pockets in containment. When the containment pressure falls below a predetermined value, the ARS fans are automatically de-energized. Thereafter, the fans are automatically cycled on and off if necessary to control any additional containment pressure transients.

2

The ARS also functions, after all the ice has melted, to circulate any steam still entering the lower compartment to the upper compartment where the Containment Spray System can cool it.

The ARS is an ESF system. It is designed to ensure that the heat removal capability required during the post accident period can be attained. The operation of the ARS, in conjunction with the ice bed, the Containment Spray System, and the Residual Heat Removal (RHR) System spray, provides the required heat removal capability to limit post accident conditions to less than the containment design values.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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, in regard to ESF systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train each of the Containment Spray System, RHR System, and ARS being inoperable (Ref. 1). The DBA analyses show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure.

CSS-042

stet

fan

train

an

3

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 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. 2).

The analysis for minimum internal containment pressure (i.e., maximum external differential containment pressure) assumes inadvertent simultaneous actuation of both the ARS and the Containment Spray System. The containment vacuum relief valves are designed to accommodate inadvertent actuation of either or both systems.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The modeled ARS actuation from the containment analysis is based upon a response time associated with exceeding the containment pressure High-High signal setpoint to achieving full ARS air flow. ~~A delayed response time initiation provides conservative analyses of peak calculated containment temperature and pressure responses~~ INSERT 1. The ARS total response time of 600 seconds consists of the built in signal delay. 2

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

LCO

In the event of a DBA, one ~~train of the~~ ARS ~~fan~~ ~~with the Hydrogen Skimmer System~~ is required to provide the minimum air recirculation for heat removal and hydrogen mixing assumed in the safety analyses. To ensure this requirement is met, two ~~trains of the~~ ARS ~~fans~~ ~~with the Hydrogen Skimmer System~~ must be OPERABLE. This will ensure that at least one ~~train~~ ~~fan~~ will operate, assuming the worst case single failure occurs, which is in the ESF power supply. stet ~~3~~

CSS-042

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the ARS. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ARS is not required to be OPERABLE in these MODES.

ACTIONS

A.1

If one ~~of the required trains of the~~ ARS ~~fan~~ is inoperable, it must be restored to OPERABLE status within 72 hours. The components in this degraded condition are capable of providing 100% of the flow ~~and hydrogen skimming~~ needs after an accident. The 72 hour Completion Time was developed taking into account the redundant flow ~~and hydrogen skimming~~ capability of the OPERABLE ARS ~~train~~ ~~fan~~ and the low probability of a DBA occurring in this period. stet ~~3~~ 2

CSS-042

B.1 and B.2

If the ARS ~~train~~ ~~fan~~ 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 ~~3~~

2 **INSERT 1**

A delayed response time initiation ensures that no energy released during the initial phase of a DBA will bypass the ice bed through the ARS fans.

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BASES

ACTIONS (continued)

operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

11

SR 3.6.14.1 1

Verifying that each ARS fan starts on an actual or simulated actuation signal, after a delay ≥ [9.0] minutes and ≤ [11.0] minutes, and operates for ≥ 15 minutes is sufficient to ensure that all fans are OPERABLE and that all associated controls and time delays are functioning properly. It also ensures that blockage, fan and/or motor failure, or excessive vibration can be detected for corrective action. [The [92] day Frequency was developed considering the known reliability of fan motors and controls and the two train redundancy available. 4 5

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 6

11

SR 3.6.14.2 1

Verifying ARS fan motor current to be at rated speed with the return air dampers closed confirms one operating condition of the fan. This test is indicative of overall fan motor performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. [The Frequency of 92 days conforms with the testing requirements for similar ESF equipment and considers the known reliability of fan motors and controls and the two train redundancy available. 8 5

OR

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

6

11

SR 3.6.14.3

1

Verifying the OPERABILITY of the return air damper provides assurance that the proper flow path will exist when the fan is started. By applying the correct counterweight, the damper operation can be confirmed. [The Frequency of 92 days was developed considering the importance of the dampers, their location, physical environment, and probability of failure. Operating experience has also shown this Frequency to be acceptable.

OR

5

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

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

6

[SR 3.6.14.4

Verifying the OPERABILITY of the motor operated valve in the Hydrogen Skimmer System hydrogen collection header to the lower containment compartment provides assurance that the proper flow path will exist when the valve receives an actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This Surveillance also confirms that the time delay to open is within specified tolerances. [The 92 day Frequency was developed considering the known reliability of the motor operated valves and controls and the two train redundancy available. Operating experience has also shown this Frequency to be acceptable.

OR

7

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]]~~ 7

REFERENCES

1. U FSAR, Section ~~[~~6.2~~]~~. 2 4
2. 10 CFR 50, Appendix K.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.11 BASES, AIR RETURN SYSTEM

1. The heading and title for ISTS 3.6.14 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.14 is renumbered as ITS 3.6.11.

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

Not used

3. ~~ISTS LCO 3.6.14 Bases refer to ARS "train" or "trains." However, the SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans." This is acceptable since the common hydrogen collection headers are passive components and are not susceptible to an active failure.~~ CSS-042

4. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

5. ISTS SR 3.6.14.1, SR 3.6.14.2, and SR 3.6.14.3 Bases provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.11.1, SR 3.6.11.2, and SR 3.6.11.3 under the Surveillance Frequency Control Program.

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

7. ISTS SR 3.6.14.4 Bases describes the surveillance requirement to verify that each motor operated valve in the hydrogen collection header that is not locked, sealed, or otherwise secured in position, opens on an actual or simulated actuation signal after the specified delay. However, the SQN Air Return System hydrogen collection headers do not include motor operated valves (or dampers) that receive actuation signals. Therefore, the Bases description of this surveillance is unnecessary and has not been included in the SQN ITS.

8. Changes are made to be consistent with changes made to the Specification.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.11, AIR RETURN SYSTEM

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 12

ITS 3.6.12, ICE BED

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

ITS 3.6.12

A01

CONTAINMENT SYSTEMS

3/4.6.5 ICE CONDENSER

ICE

ICE BED

CSS-022

LIMITING CONDITION FOR OPERATION

LCO 3.6.12 3.6.5.1. The ice bed shall be OPERABLE with:

SR 3.6.12.5 4 a. The stored ice having a boron concentration of ≥ 1800 ppm and ≤ 2500 ppm boron ~~as sodium tetraborate~~ STET and a pH of 9.0 to 9.5, LA01

2,247,250

SR 3.6.12.4 3 b. Flow channels through the ice condenser, ~~2,187,250~~ L01

SR 3.6.12.1 c. A maximum ice bed temperature of less than or equal 27°F,

~~2,540,808~~ A02

SR 3.6.12.2 d. A total ice weight of at least ~~2,225,880~~ pounds at a 95% level of confidence, and

~~2,610,792~~ LA01

3.6.12.2 ~~e. 1944 ice baskets.~~ STET

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

ACTION:

ACTION A With the ice bed inoperable, restore the ice bed to OPERABLE status within 48 hours or be in at least
ACTION B HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1 The ice condenser shall be determined OPERABLE:

SR 3.6.12.1 a. ~~At least once per 12 hours by~~ STET verifying that the maximum ice bed temperature is less than or equal to 27°F. LA02

SR 3.6.12.4 3 b. ~~At least once per 18 months by~~ verifying, by visual inspection, accumulation of ice on structural members comprising flow channels through the ice bed is ≤ 15 percent blockage of the total flow area for each safety analysis section. LA02

~~In accordance with the Surveillance Frequency Control Program~~ LA02

September 30, 2002
Amendment No. 4, 126, 131, 224, 267, 269, 277, 279

ITS 3.6.12

A01

CONTAINMENT SYSTEMS

ICE

STET

CSS-022

SURVEILLANCE REQUIREMENTS (Continued)

In accordance with the Surveillance Frequency Control Program

LA02

SR 3.6.12.6 5 c. At least once per 40 months by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection.

INSERT 1

L02

STET

SR 3.6.12.2 d. At least once per 18 months by:

In accordance with the Surveillance Frequency Control Program

LA02

1. Deleted.

2. Weighing a representative sample of at least 144 ice baskets and verifying that each basket contains at least 1145 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1145 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1145 pounds/basket at a 95% level of confidence.

1307 1343 A02

Add proposed zone requirements.

The ice condenser shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1145 pounds/basket at a 95% level of confidence.

STET

1307 1343 A02

L01

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,225,880 pounds.

2,610,792 2,540,808 A02

SR 3.6.12.5 4 e. At least once per 54 months by chemical analysis of the stored ice in at least one randomly selected ice basket from each ice condenser bay verify:

In accordance with the Surveillance Frequency Control Program

LA02

LA01

1. Ice bed boron concentration is ≥ 1800 ppm and ≤ 2500 ppm as sodium tetraborate and;

STET

2. pH is ≥ 9.0 and ≤ 9.5

SR 3.6.12.5 Note 4 NOTE: The requirements of this SR are satisfied if the boron concentration and pH values obtained from averaging the individual sample results are within the limits specified above.

SR 3.6.12.7 6 f. Each ice addition verify, by chemical analysis, that ice added to the ice condenser meets the boron concentration and pH requirements of SR 4.6.5.1.e.

SR 3.6.12.7 Note 6 NOTE: The chemical analysis may be performed on either the liquid solution or the resulting ice.

Add proposed SR 3.6.12.3 at a Frequency of 18 months.

M01

In accordance with the Surveillance Frequency Control Program

LA02

ICE

INSERT 1 L02

Group of bays as defined below:

a. Group 1 - bays 1 through 8;

b. Group 2 - bays 9 through 16; and

c. Group 3 - bays 17 through 24.

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CONTAINMENT SYSTEMS

ICE BED TEMPERATURE MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.5.2 This specification is deleted.

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ITS 3.6.12

A01

CONTAINMENT SYSTEMS

3/4.6.5 ICE CONDENSER

ICE BED

ICE

CSS-022

LIMITING CONDITION FOR OPERATION

LCO 3.6.12 3.6.5.1 The ice bed shall be OPERABLE with:

SR 3.6.12.5 [4] a. The stored ice having a boron concentration of ≥ 1800 ppm and ≤ 2500 ppm boron ~~as sodium tetraborate~~ [STET] and a pH of 9.0 to 9.5, LA01

SR 3.6.12.4 [3] b. Flow channels through the ice condenser, L01

SR 3.6.12.1 c. A maximum ice bed temperature of less than or equal to 27°F,

SR 3.6.12.2 d. A total ice weight of at least ~~2,225,880~~ [2,247,250] [2,187,250] [2,540,808] [2,610,792] pounds at a 95% level of confidence, and A02

3.6.12.2 ~~e. 1944 ice baskets.~~ [STET] LA01

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

ACTION:

ACTION A With the ice bed inoperable, restore the ice bed to OPERABLE status within 48 hours or be in at least
ACTION B HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.5.1 The ice condenser shall be determined OPERABLE:

SR 3.6.12.1 a. ~~At least once per 12 hours~~ [STET] verifying that the maximum ice bed temperature is less than or equal to 27°F. LA02

SR 3.6.12.4 [3] b. ~~At least once per 18 months~~ [STET] by verifying, by visual inspection, accumulation of ice on structural members comprising flow channels through the ice bed is ≤ 15 percent blockage of the total flow area for each safety analysis section. LA02

~~In accordance with the Surveillance Frequency Control Program~~ LA02

A01

CONTAINMENT SYSTEMS

ICE CSS-022

SURVEILLANCE REQUIREMENTS (Continued)

STET

In accordance with the Surveillance Frequency Control Program LA02

SR 3.6.12.6 5 INSERT 1

c. At least once per 40 months by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection. STET L02

d. At least once per 18 months by:

In accordance with the Surveillance Frequency Control Program LA02

1. Deleted.

SR 3.6.12.2

2. Weighing a representative sample of at least 144 ice baskets and verifying that each basket contains at least 1146 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1145 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1145 pounds/basket at a 95% level of confidence.

1343 1307 A02 Add proposed zone requirements. STET L01

The ice condenser shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1145 pounds/basket at a 95% level of confidence.

1343 1307 A02 1307 1343 A02

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,225,880 pounds.

2,540,808 2,610,792 A02

SR 3.6.12.5 4

e. At least once per 54 months by chemical analysis of the stored ice in at least one randomly selected ice basket from each ice condenser bay verify:

In accordance with the Surveillance Frequency Control Program LA02 LA01

1. Ice bed boron concentration is ≥ 1800 ppm and ≤ 2500 ppm as sodium tetraborate and; STET

2. pH is ≥ 9.0 and ≤ 9.5

SR 3.6.12.5 Note 4

NOTE: The requirements of this SR are satisfied if the boron concentration and pH values obtained from averaging the individual sample results are within the limits specified above.

SR 3.6.12.7 6

f. Each ice addition verify, by chemical analysis, that ice added to the ice condenser meets the boron concentration and pH requirements of SR 4.6.5.1.e.

SR 3.6.12.7 Note 6

NOTE: The chemical analysis may be performed on either the liquid solution or the resulting ice

Add proposed SR 3.6.12.3 at a Frequency of 18 months. M01

In accordance with the Surveillance Frequency Control Program LA02

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ICE

INSERT 1 L02

Group of bays as defined below:

a. Group 1 - bays 1 through 8;

b. Group 2 - bays 9 through 16; and

c. Group 3 - bays 17 through 24.

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CONTAINMENT SYSTEMS

ICE BED TEMPERATURE MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.5.2 This specification is deleted.

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DISCUSSION OF CHANGES
ITS 3.6.12, ICE BED

ADMINISTRATIVE CHANGES

ICE

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 This change is provided consistent with Technical Specification Amendment request TS-SQN-12-04, "Application to Modify Ice Condenser Technical Specifications to Address Revisions in Westinghouse Mass and Energy Release Calculation (TS-SQN-12-04)," submitted to the USNRC for approval in a letter from J.W. Shea (TVA), dated July 3, 2012 (ADAMS Accession No. ML13199A281). In addition, letter TS-SQN-12-04 requested an approval date of May 31, 2014. As it is anticipated that the SQN ITS Conversion License Amendment Request (LAR) will not be approved by the NRC before this date, any revisions made to CTS markups included in letter TS-SQN-12-04 prior to its approval will be reflected in the SQN ITS Conversion LAR. As such, these changes are administrative.

Not used

MORE RESTRICTIVE CHANGES

CSS-022

M01 CTS 4.6.5.1.d.2 requires weighing a sample of at least 144 ice baskets and verifying each basket contains at least ~~1307~~ 1343 lbs of ice. CTS 4.6.5.1.d.2 also specifies that if any ice basket contains less than ~~1307~~ 1343 lbs of ice, additional ice baskets must be weighed. ITS SR 3.6.12.2 requires a verification of the total ice mass by calculating the mass of stored ice in each of three radial zones by selecting, at random, 30 ice baskets in each radial zone. It also verifies that each radial zone contains the required ice mass. (See DOC A02 for the discussion of changes related to changing the individual ice basket weight from 1145 lbs of ice to ~~1307~~ 1343 lbs of ice. See DOC L01 for the discussion of changes for eliminating the requirement to verify each sampled basket contains at least ~~1307~~ 1343 lbs of ice, and for eliminating the requirement for weighing additional ice baskets if one or more ice baskets do not contain at least ~~1307~~ 1343 lbs of ice.) ITS 3.6.12.3 adds a new Surveillance to verify that the ice mass of each basket sampled in SR 3.6.12.2 is at least 600 lbs every 18 months. This changes the CTS by adding the additional Surveillance verification. (See DOC LA02 for moving the 18 month Frequency for this Surveillance Requirement to the Surveillance Frequency Control Program.)

The containment ice bed provides a large heat sink in the event of a release of energy from a design basis accident (DBA) in containment. The ice absorbs energy and therefore, limits containment peak pressure and temperature. The ice baskets contain the ice within the ice condenser. The ice baskets position the ice within the ice bed in an arrangement that promotes heat transfer from steam to ice. The arrangement enhances the ice condenser's ability to condense steam

DISCUSSION OF CHANGES
ITS 3.6.12, ICE BED ICE

and absorb heat energy released to the containment during a DBA. Therefore, it is vital that the ice be appropriately distributed around the ice condenser bays. This is especially important during the initial blowdown, so that the steam and water mixture entering the lower compartment does not pass through only part of the ice condenser, depleting the ice there while bypassing the ice in other bays. The ice bed can become degraded over a long service period through loss due to melting or sublimation, and by obstruction of flow passages through the ice bed due to buildup of ice. The purpose of ITS 3.6.12 is to ensure the required quantity of stored ice is appropriately distributed in the ice bed with open flow paths through the ice to effectively absorb the heat energy associated with a DBA without exceeding containment design pressure and temperature. Therefore, ITS 3.6.12 adds a specific Surveillance (ITS SR 3.6.12.3) to verify that each selected sample basket contains at least 600 lbs of ice in the as-found (pre-maintenance) condition every 18 months, thereby ensuring that a significant localized degraded ice mass condition is avoided. This change is designated as more restrictive because it adds a Surveillance verification to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

Not used

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.5.1.e requires the ice bed to be OPERABLE with 1944 baskets. CTS 3.6.5.1 and CTS 4.6.5.1.e state that the boron being used to meet the limit for stored ice boron concentration is in the form of sodium tetraborate. ITS LCO 3.6.12 requires the ice bed to be OPERABLE, but does not specify the number of ice baskets. ITS SR 3.6.12.5 specifies an upper and lower limit (≥ 1800 ppm and ≤ 2500 ppm) for stored boron concentration, but does not include the form of the boron (i.e., sodium tetraborate). This changes the CTS by moving the details that the ice bed contains 1944 ice baskets, and that the boron must be in the form of sodium tetraborate to the Bases.

The removal of these details, which are related to system design limits, 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. ITS LCO 3.6.12 still requires the ice bed to be OPERABLE, and ITS SR 3.6.12.5 still retains the requirement concerning the boron concentration limits. 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 the Bases 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 limits is being removed from the Technical Specifications.

LA02 *(Type 5 – Removal of SR Requirement to the Surveillance Frequency Control Program)* CTS 4.6.5.1.a requires verification that the maximum ice bed

DISCUSSION OF CHANGES
ITS 3.6.12, ICE BED

ICE

temperature is within limits at least once per 12 hours. ITS SR 3.6.12.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.1.b requires verification that the accumulation of ice on the structural members comprising flow channels through the ice bed is within limits at least once per 18 months. ITS SR 3.6.12.4 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.1.c requires a verification that the ice baskets are free from detrimental structural wear, cracks, corrosion or other damage at least once per 40 months. ITS SR 3.6.12.6 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.1.d requires a verification that the total weight of the ice baskets is within limits by weighing a representative sample at least once per 18 months. ITS SR 3.6.12.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.1.e requires a verification that the boron concentration and pH of a random sampling of ice baskets are within limits at least once per 54 months. ITS SR 3.6.12.5 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program. Additionally, ITS SR 3.6.12.3 has been added to verify that each selected sample basket contains at least 600 lbs of ice in the as-found (pre-maintenance) condition every 18 months. (See DOC M01 for the discussion on adding the SR.) The 18 month Frequency for this Surveillance has been relocated to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

CSS-022

L01 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.5.1.d.2 requires weighing a sample of at least 144 ice baskets and verifying each ice basket contains at least ~~1307~~ 1343 lbs of ice to determine the total as-left ice condenser ice weight to be not less than ~~2,540,808~~ 2,610,472 lbs at a 95%

Not used

ICE

CSS-022

~~DISCUSSION OF CHANGES~~
ITS 3.6.12, ICE BED

confidence level. CTS 4.6.5.1.d.2 specifies the locations of the ice basket to be sampled and, if any ice basket contains less than ~~1307~~ 1343 lbs of ice, additional ice baskets must be weighed. It also requires the weighed baskets to be divided into three groups, with each group averaging ~~1307~~ 1343 lbs of ice per ice basket. ITS SR 3.6.12.2 requires a verification of the total as-found ice mass (~~2,187,250~~ 2,247,250 lbs) by calculating the mass of stored ice in each of three radial zones by selecting, at random, 30 ice baskets in each radial zone. It also verifies that each radial zone contains at least ~~729,084~~ 749,084 lbs of ice (total of ~~2,187,250~~ 2,247,250 divided by three and rounded up for conservatism). ITS SR 3.6.12.3 requires a verification that each ice basket sampled in SR 3.6.12.2 contains at least 600 lbs of ice. This changes the CTS by deleting the requirement to sample six baskets from each of the 24 ice condenser bays. This requirement is replaced with a requirement for a representative sample size of at least 30 baskets in each of three radial zones. This also changes the CTS by requiring verification of an as-found ice basket weight versus an as-left ice basket weight that includes an additional amount of ice to account for ice sublimation during the operating cycle. This change also deletes the requirement to sample additional ice baskets, if any ice basket contains less than ~~1307~~ 1343 lbs of ice. The addition of SR 3.6.12.3 is discussed in DOC M01.

The purpose of CTS 3.6.5.1.d and CTS 4.6.5.1.d.2 is to verify a sufficient ice condenser ice mass is available to provide a heat sink in the event of an energy release in containment from a loss-of-coolant accident (LOCA) or a steam line break (SLB). This change is acceptable because the relaxed Surveillance Requirement acceptance criteria continue to ensure the ice bed can perform its required function. The proposed statistical sampling plan change (ITS SR 3.6.12.2) stratifies the ice bed population into three radial zones that contain rows of ice baskets exhibiting similar characteristics and requires at least 30 random sample ice baskets for ice mass verification in each radial zone. The stratified sampling allows subpopulations to be defined that have similar mean mass characteristics resulting in better estimates of total ice mass. A 30-ice basket random sample from each radial zone maintains a 95% confidence level for calculation of total stored ice. The modified sampling methodology provides the validation of total ice mass and verification of ice mass distribution within the ice bed, in lieu of a limited azimuthal row-group surveillance. The proposed ice bed sub-populations (radial zones) and sample size directly applies Ice Condenser Utility Group (ICUG) ice bed historical operating experience, provides clear linkage to statistical sampling methodology provided in NUREG-1475, "Applying Statistics," and supports validation of total stored ice for the long-term/overall DBA analysis. In addition, the new minimum blowdown ice mass acceptance criteria value for each ice basket sampled (SR 3.6.12.3) ensures that an anomalous gross degradation of the ice bed does not exist, supports the DBA analysis during the blowdown phase, and directly applies the blowdown data from the original Westinghouse Waltz-Mill testing as described in the UFSAR. These changes are designated as less restrictive, because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L02 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.6.5.1.c requires lifting (at least 10 feet) and visually inspecting the accessible portions of at least two ice baskets from each one-third of the ice

Not used

ICE

DISCUSSION OF CHANGES
ITS 3.6.12, ICE BED

condenser and verifying that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. CTS 4.6.5.1.d.2 defines the three groups of baskets as; Group 1 – bays 1 through 8, Group 2 – bays 9 through 16, and Group 3 – bays 17 through 24. ITS SR 3.6.12.6 requires a visual inspection, for detrimental structural wear, cracks, corrosion, or other damage, two ice baskets from each group of three bays (as Group 1 – bays 1 through 8, Group 2 – bays 9 through 16, and Group 3 – bays 17 through 24). The Bases for ITS SR 3.6.12.6 includes clarifying guidance that indicates the intent of the inspection is to perform an inspection of the full-length of the basket. This changes the CTS by removing the requirement to raise the ice basket at least 10 feet for the inspection.

ITS 3.6.12.6

The purpose of CTS 4.6.5.1.c is to verify that a representative sampling of ice baskets has not been degraded by wear, cracks, corrosion, or other damage. The Surveillance Requirement consists of a full-length inspection of a sample of baskets and is intended to monitor the effect of the ice condenser environment on ice baskets. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria continue to ensure the ice bed can perform its required function. These changes are designated as less restrictive, because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS. CSS-025

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

CTS

Ice Bed ~~(Ice Condenser)~~
3.6.~~15~~ 12 1

3.6 CONTAINMENT SYSTEMS

3.6.~~15~~ 12 Ice Bed ~~(Ice Condenser)~~ 1

3.6.5.1 LCO 3.6.~~15~~ 12 The ice bed shall be OPERABLE. 1

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION	A. Ice bed inoperable.	A.1 Restore ice bed to OPERABLE status.	48 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	ICE
4.6.5.1.a 3.6.5.1.c	SR 3.6.~~15~~ 12 .1 Verify maximum ice bed temperature is ≤ [27]°F.	~~[12 hours~~ STET ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program~~]	1 2 3 3

CTS

CSS-022 ICE 2,247,250

Ice Bed (Ice Condenser)
3.6.15

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
4.6.5.1.d 4.6.5.1.d.2 3.6.5.1.d 3.6.5.1.e	SR 3.6.15.2	Verify total mass of stored ice is ≥ [2,200,000] lbs by calculating the mass of stored ice, at a 95% confidence level, in each of three Radial Zones as defined below, by selecting a random sample of ≥ 30 ice baskets in each Radial Zone, and Verify: 1. Zone A (radial rows [7,8,9]), has a total mass of ≥ [733,400] lbs. 2. Zone B (radial rows [4,5,6]), has a total mass of ≥ [733,400] lbs. 3. Zone C (radial rows [1,2,3]), has a total mass of ≥ [733,400] lbs.	[18 months STET OR In accordance with the Surveillance Frequency Control Program]
DOC M01	SR 3.6.15.3	Verify that the ice mass of each basket sampled in SR 3.6.15.2 is ≥ 600 lbs.	[18 months OR In accordance with the Surveillance Frequency Control Program]
4.6.5.1.b	SR 3.6.15.4 3	Verify, by visual inspection, accumulation of ice on structural members comprising flow channels through the ice bed is ≤ 15 percent blockage of the total flow area for each safety analysis section.	[18 months STET OR In accordance with the Surveillance Frequency Control Program]

Annotations: 2,197,250; Insert 1; 749,084 / 729,084 (Zones A, B, C); a, b, c; 1, 2, 3; 7, 8, 9; 12; 1; 2; 3; 4; 5

ICE

INSERT 1

Verify, by weighing a representative sample of at least 144 ice baskets, that each basket contains at least 1145 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1145 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1145 pounds/basket at a 95% level of confidence.

The ice condenser with 1944 ice baskets shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1145 pounds/basket at a 95% level of confidence.

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,225,880 pounds.

CTS

Ice Bed (Ice Condenser) 1
3.6.15 12

ICE

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
4.6.5.1.e 4.6.5.1.e NOTE	SR 3.6.15.5 12 4 -----------------------------NOTE----------------------------- The requirements of this SR are satisfied if the boron concentration and pH values obtained from averaging the individual sample results are within the limits specified below. -- Verify, by chemical analysis of the stored ice in at least one randomly selected ice basket from each ice condenser bay, that ice bed: a. Boron concentration is a ≥ [1800] ppm and ≤ [2000] 2500 ppm and as sodium tetraborate b. pH is ≥ [9.0] and ≤ [9.5].	[[54] months STET OR In accordance with the Surveillance Frequency Control Program] 5	1 3 2 3
4.6.5.1.c	SR 3.6.15.6 12 5 Insert 2 Visually inspect, for detrimental structural wear, cracks, corrosion, or other damage, two ice baskets from each group of bays as defined below: a. Group 1 - bays 1 through 8; b. Group 2 - bays 9 through 16; and c. Group 3 - bays 17 through 24.	[40 months STET OR In accordance with the Surveillance Frequency Control Program] 5	1 3 3
4.6.5.1.f 4.6.5.1.f Note	SR 3.6.15.7 12 6 -----------------------------NOTE----------------------------- The chemical analysis may be performed on either the liquid solution or on the resulting ice. -- Verify, by chemical analysis, that ice added to the ice condenser meets the boron concentration and pH requirements of SR 3.6.15.5. 12 4	Each ice addition	1 1

ICE

INSERT 2

Verify, by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser, that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection.

CTS

Ice Bed ~~(Ice Condenser)~~
3.6.~~15~~ 12 (1)

3.6 CONTAINMENT SYSTEMS

3.6.~~15~~ 12 Ice Bed ~~(Ice Condenser)~~ (1)

3.6.5.1 LCO 3.6.~~15~~ 12 The ice bed shall be OPERABLE. (1)

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION	A. Ice bed inoperable.	A.1 Restore ice bed to OPERABLE status.	48 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
4.6.5.1.a 3.6.5.1.c	SR 3.6.~~15~~ 12.1 Verify maximum ice bed temperature is ≤ [27]°F.	~~[12 hours~~ ← STET (1) (2) (3) ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~ (3)

ICE

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CTS

Ice Bed (Ice Condenser)
3.6.15 12

CSS-022

ICE

2,247,250

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
4.6.5.1.d 4.6.5.1.d.2 3.6.5.1.d 3.6.5.1.e	SR 3.6.15.2 (12)	Verify total mass of stored ice is ≥ [2,200,000] lbs by calculating the mass of stored ice, at a 95% confidence level, in each of three Radial Zones as defined below, by selecting a random sample of ≥ 30 ice baskets in each Radial Zone, and Verify: a 1. Zone A (radial rows [7,8,9]), has a total mass of ≥ [733,400] lbs. b 2. Zone B (radial rows [4,5,6]), has a total mass of ≥ [733,400] lbs. c 3. Zone C (radial rows [1,2,3]), has a total mass of ≥ [733,400] lbs.	[18 months STET OR In accordance with the Surveillance Frequency Control Program]
DOC M01	SR 3.6.15.3 (12)	Verify that the ice mass of each basket sampled in SR 3.6.15.2 is ≥ 600 lbs.	[18 months OR In accordance with the Surveillance Frequency Control Program]
4.6.5.1.b	SR 3.6.15.4 (12) 3	Verify, by visual inspection, accumulation of ice on structural members comprising flow channels through the ice bed is ≤ 15 percent blockage of the total flow area for each safety analysis section.	[18 months STET OR In accordance with the Surveillance Frequency Control Program]

Annotations: 2,197,250; Insert 1; 1, 2, 3; 749,084 / 729,084 (Zone A); 749,084 / 729,084 (Zone B); 7, 8, 9; 749,084 / 729,084 (Zone C); 5; 1 2 3 4

ICE

INSERT 1

Verify, by weighing a representative sample of at least 144 ice baskets, that each basket contains at least 1145 lbs of ice. The representative sample shall include 6 baskets from each of the 24 ice condenser bays and shall be constituted of one basket each from Radial Rows 1, 2, 4, 6, 8 and 9 (or from the same row of an adjacent bay if a basket from a designated row cannot be obtained for weighing) within each bay. If any basket is found to contain less than 1145 pounds of ice, a representative sample of 20 additional baskets from the same bay shall be weighed. The minimum average weight of ice from the 20 additional baskets and the discrepant basket shall not be less than 1145 pounds/basket at a 95% level of confidence.

The ice condenser with 1944 ice baskets shall also be subdivided into 3 groups of baskets, as follows: Group 1 - bays 1 through 8, Group 2 - bays 9 through 16, and Group 3 - bays 17 through 24. The minimum average ice weight of the sample baskets from Radial Rows 1, 2, 4, 6, 8 and 9 in each group shall not be less than 1145 pounds/basket at a 95% level of confidence.

The minimum total ice condenser ice weight at a 95% level of confidence shall be calculated using all ice basket weights determined during this weighing program and shall not be less than 2,225,880 pounds.

CTS

Ice Bed (Ice Condenser)
3.6.15 12 (1)

ICE

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
4.6.5.1.e 4.6.5.1.e NOTE	SR 3.6.15.5 (4) 12	------------------------------NOTE------------------------------ The requirements of this SR are satisfied if the boron concentration and pH values obtained from averaging the individual sample results are within the limits specified below. --- Verify, by chemical analysis of the stored ice in at least one randomly selected ice basket from each ice condenser bay, that ice bed: a. Boron concentration is a ≥ [1800] ppm and ≤ [2000] 2500 ppm and as sodium tetraborate b. pH is ≥ [9.0] and ≤ [9.5].	[[54] months STET OR In accordance with the Surveillance Frequency Control Program] (5)	(1) (3) (2) (3)
4.6.5.1.c	SR 3.6.15.6 12 (5) Insert 2	Visually inspect, for detrimental structural wear, cracks, corrosion, or other damage, two ice baskets from each group of bays as defined below: a. Group 1 - bays 1 through 8; b. Group 2 - bays 9 through 16; and c. Group 3 - bays 17 through 24.	[40 months STET OR In accordance with the Surveillance Frequency Control Program] (5)	(1) (3) (3)
4.6.5.1.f 4.6.5.1.f Note	SR 3.6.15.7 12 (6)	------------------------------NOTE------------------------------ The chemical analysis may be performed on either the liquid solution or on the resulting ice. --- Verify, by chemical analysis, that ice added to the ice condenser meets the boron concentration and pH requirements of SR 3.6.15.5. (4) 12	Each ice addition	(1) (1)

ICE

INSERT 2

Verify, by lifting and visually inspecting the accessible portions of at least two ice baskets from each 1/3 of the ice condenser, that the ice baskets are free of detrimental structural wear, cracks, corrosion or other damage. The ice baskets shall be raised at least 10 feet for this inspection.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.12, ICE BED ICE

1. The heading and title for ISTS 3.6.15 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS, and ISTS 3.6.15 is renumbered as ITS 3.6.12.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

3. ISTS SR 3.6.15.1, SR 3.6.15.2, SR 3.6.15.3, SR 3.6.15.4, SR 3.6.15.5, SR 3.6.15.6, and SR 3.6.15.7 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to ~~control the Surveillance Frequencies for ITS SR 3.6.12.1, SR 3.6.12.2, SR 3.6.12.3, SR 3.6.12.4, SR 3.6.12.5, SR 3.6.12.6, and SR 3.6.12.7 under the Surveillance Frequency Control Program~~ retain the current Surveillance Frequencies in the ITS.

4. Not Used ~~These changes are grammatical corrections, correcting punctuation, or other changes that are consistent with the Writers Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01~~.

5. Changes are made to ISTS 3.6.15 which reflect the SQN current Technical Specification Ice Bed Operability requirements, SR testing requirements and SR testing methodology.

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

ICE ~~CSS-022~~

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~15~~ 12 Ice Bed ~~(Ice Condenser)~~ (1)

1,916,000 ~~2,247,250~~ ~~2,187,250~~ (11) (2)

BASES

BACKGROUND

The ice bed consists of a minimum of ~~[2,200,000]~~ lb of ice stored within the ice condenser. The primary purpose of the ice bed is to provide a large heat sink in the event of a release of energy from a Design Basis Accident (DBA) in containment. The ice would absorb energy and limit containment peak pressure and temperature during the accident transient. Limiting the pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

The ice condenser is an annular compartment enclosing approximately 300~~°~~ degrees of the perimeter of the upper containment compartment, but penetrating the operating deck so that a portion extends into the lower containment compartment. The lower portion has a series of hinged doors exposed to the atmosphere of the lower containment compartment, which, for normal unit operation, are designed to remain closed. At the top of the ice condenser is another set of doors exposed to the atmosphere of the upper compartment, which also remain closed during normal unit operation. Intermediate deck doors, located below the top deck doors, form the floor of a plenum at the upper part of the ice condenser. These doors also remain closed during normal unit operation. The upper plenum area is used to facilitate surveillance and maintenance of the ice bed. (3)

~~The~~ 1944 ice baskets contain the ice within the ice condenser. The ice bed is considered to consist of the total volume from the bottom elevation of the ice baskets to the top elevation of the ice baskets. The ice baskets position the ice within the ice bed in an arrangement to promote heat transfer from steam to ice. This arrangement enhances the ice condenser's primary function of condensing steam and absorbing heat energy released to the containment during a DBA. (4)

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the top deck doors to open, which allows the air to flow out of the ice condenser into the upper compartment. Steam condensation within the ice condenser limits the pressure and temperature buildup in containment. A divider barrier (i.e., operating deck and extensions thereof) separates the upper and lower compartments and ensures that the steam is directed into the ice condenser.

BASES

BACKGROUND (continued)

The ice, together with the containment spray, is adequate to absorb the initial blowdown of steam and water from a DBA and the additional heat loads that would enter containment during several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves ~~to equalize pressures in containment and~~ to continue circulating heated air and steam from the lower compartment through the ice condenser where the heat is removed by the remaining ice. 4

As ice melts, the water passes through the ice condenser floor drains into the lower compartment. Thus, a second function of the ice bed is to be a large source of borated water (via the containment sump) for long term Emergency Core Cooling System (ECCS) and Containment Spray System heat removal functions in the recirculation mode.

A third function of the ice bed and melted ice is to remove fission product iodine that may be released from the core during a DBA. Iodine removal occurs during the ice melt phase of the accident and continues as the melted ice is sprayed into the containment atmosphere by the Containment Spray System. The ice is adjusted to an alkaline pH that facilitates removal of radioactive iodine from the containment atmosphere. ~~The alkaline pH also minimizes the occurrence of the chloride and caustic stress corrosion on mechanical systems and components exposed to ECCS and Containment Spray System fluids in the recirculation mode of operation.~~ 5

It is important for ice to exist in the ice baskets, the ice to be appropriately distributed around the 24 ice condenser bays, and for open flow paths to exist around ice baskets. This is especially important during the initial blowdown so that the steam and water mixture entering the lower compartment do not pass through only part of the ice condenser, depleting the ice there while bypassing the ice in other bays.

Two phenomena that can degrade the ice bed during the long service period are:

a. Loss of ice by melting or sublimation ; and 6

b. Obstruction of flow passages through the ice bed due to buildup of ice.

BASES

BACKGROUND (continued)

Both of these degrading phenomena are reduced by minimizing air leakage into and out of the ice condenser.

The ice bed limits the temperature and pressure that could be expected following a DBA, thus limiting leakage of fission product radioactivity from containment to the environment.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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 not assumed to occur simultaneously or consecutively.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed in regards to containment Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train ~~each~~ of the Containment Spray System and one ARS fan being inoperable. 7

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. For certain aspects of the transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the cooling effectiveness of the ECCS 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. 2).

The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5, "Containment Air Temperature."

In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The ice bed satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The ice bed LCO requires the existence of the required quantity of stored ice, appropriate distribution of the ice ~~and~~ within the ice bed, open flow paths through the ice bed, and appropriate chemical content and pH of the stored ice. The stored ice functions to absorb heat during the blowdown phase and long term phase of a DBA, thereby limiting containment air temperature and pressure. The chemical content and pH of the stored ice provide core SDM (boron content) and remove radioactive iodine from the containment atmosphere when the melted ice is recirculated through the ECCS and the Containment Spray System, respectively. 6

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the ice bed. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ice bed is not required to be OPERABLE in these MODES.

ACTIONS

A.1

If the ice bed is inoperable, it must be restored to OPERABLE status within 48 hours. The Completion Time was developed based on operating experience, which confirms that due to the very large mass of stored ice, the parameters comprising OPERABILITY do not change appreciably in this time period. ~~Because of this fact, the Surveillance Frequencies are long (months), except for the ice bed temperature, which is checked every 12 hours.~~ If a degraded condition is identified, even for temperature, with such a large mass of ice it is not possible for the degraded condition to significantly degrade further in a 48 hour period. Therefore, 48 hours is a reasonable amount of time to correct a degraded condition before initiating a shutdown. 8

B.1 and B.2

If the ice bed 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.

Ice Bed (Ice Condenser)
B 3.6.15 12 1

BASES ICE

SURVEILLANCE REQUIREMENTS

SR 3.6.15.1

Verifying that the maximum temperature of the ice bed is ≤ [27]°F ensures that the ice is kept well below the melting point. [The 12 hour Frequency was based on operating experience, which confirmed that, due to the large mass of stored ice, it is not possible for the ice bed temperature to degrade significantly within a 12 hour period and was also based on assessing the proximity of the LCO limit to the melting temperature.

STET

Furthermore, the 12 hour Frequency is considered adequate in view of indications in the control room, including the alarm, to alert the operator to an abnormal ice bed temperature condition. This SR may be satisfied by use of the Ice Bed Temperature Monitoring System.

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
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SR 3.6.15.2

11

Ice mass determination methodology is designed to verify the total as-found (pre-maintenance) mass of ice in the ice bed, and the appropriate distribution of that mass, using a random sampling of individual baskets. The random sample will include at least 30 baskets from each of three defined Radial Zones (at least 90 baskets total). Radial Zone A consists of baskets located in rows [7, 8, and 9] 1, 2, and 3 (innermost rows adjacent to the crane wall), Radial Zone B consists of baskets located in rows [4, 5, and 6] (middle rows of the ice bed), and Radial Zone C consists of baskets located in rows [1, 2, and 3] 7, 8, and 9 (outermost rows adjacent to the containment vessel).

Insert 1

The Radial Zones chosen include the row groupings nearest the inside and outside walls of the ice bed and the middle rows of the ice bed. These groupings facilitate the statistical sampling plan by creating sub-populations of ice baskets that have similar mean mass and sublimation characteristics.

ICE 11

INSERT 1

The minimum weight figure of 1145 pounds of ice per basket contains a 15% conservative allowance for ice loss through sublimation which is a factor of 15 higher than assumed for the ice condenser design. The minimum weight figure of 2,225,880 pounds of ice also contains an additional 1% conservative allowance to account for systematic error in weighing instruments.

The Frequency of 18 months was based on ice storage tests and the allowance built into the required ice mass over and above the mass assumed in the safety analyses. Operating experience has verified that, with the 18-month Frequency, the weight requirements are maintained with no significant degradation between surveillances.

ICE

BASES

SURVEILLANCE REQUIREMENTS (continued)

11

This Methodology for determining sample ice basket mass will be either by direct lifting or by alternative techniques. Any method chosen will include procedural allowances for the accuracy of the method used. [The number of sample baskets in any Radial Zone may be increased one by adding 20 or more randomly selected baskets to verify the total mass of that Radial Zone.] 10 2 2

once

In the event the mass of a selected basket in a sample population (initial or expanded) cannot be determined by any available means (e.g., due to surface ice accumulation or obstruction), a randomly selected representative alternate basket may be used to replace the original selection in that sample population. If employed, the representative alternate must meet the following criteria:

a. Alternate selection must be from the same bay-Zone (i.e., same bay, same Radial Zone) as the original selection, and

b. Alternate selection cannot be a repeated selection (original or alternate) in the current Surveillance, and cannot have been used as an analyzed alternate selection in the three most recent Surveillances.

The complete basis for the methodology used in establishing the 95% confidence level in the total ice bed mass is documented in Reference 4 and approved in Reference 5.

The total ice mass and individual Radial Zone ice mass requirements defined in this Surveillance, and the minimum ice mass per basket requirement defined by SR 3.6.15.3, are the minimum requirements for OPERABILITY. Additional ice mass beyond the SRs is maintained to address sublimation. This sublimation allowance is generally applied to baskets in each Radial Zone, as appropriate, at the beginning of an operating cycle to ensure sufficient ice is available at the end of the operating cycle for the ice condenser to perform its intended design function. 12 1

STET → [The Frequency of 18 months was based on ice storage tests, and the typical sublimation allowance maintained in the ice mass over and above the minimum ice mass assumed in the safety analyses. Operating and maintenance experience has verified that, with the 18 month Frequency, the minimum mass and distribution requirements in the ice bed are maintained. 8

OR

Ice Bed (Ice Condenser)
B 3.6.15 12 1

ICE

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 8

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement. 9 11
-----]

12

SR 3.6.15.3 1

12

Verifying that each selected sample basket from SR 3.6.15.2 contains at least 600 lbs of ice in the as-found (pre-maintenance) condition ensures that a significant localized degraded mass condition is avoided.

This SR establishes a per basket limit to ensure any ice mass degradation is consistent with the initial conditions of the DBA by not significantly affecting the containment pressure response. Reference 4 provides insights through sensitivity runs that demonstrate that the containment peak pressure during a DBA is not significantly affected by the ice mass in a large localized region of baskets being degraded below the required safety analysis mean, when the Radial Zone and total ice mass requirements of SR 3.6.15.2 are satisfied. Any basket identified as containing less than 600 lbs of ice requires appropriately entering the TS Required Action for an inoperable ice bed due to the potential that it may represent a significant condition adverse to quality. 12 1

CSS-022

1156 1156

As documented in Reference 4, maintenance practices actively manage individual ice basket mass above the required safety analysis mean for each Radial Zone. Specifically, each basket is serviced to keep its ice mass above [1132] 1125.13 lbs for Radial Zone A, [1132] lbs for Radial Zone B, and [1132] 1125.13 lbs for Radial Zone C. If a basket sublimates below the safety analysis mean value, this instance is identified within the plant's corrective action program, including evaluating maintenance practices to identify the cause and correct any deficiencies. These maintenance practices provide defense in depth beyond compliance with the ice bed Surveillance Requirements by limiting the occurrence of individual baskets with ice mass less than the required safety analysis mean. 2

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~15~~.~~4~~ 12 3 11 1

This SR ensures that the flow channels through the ice bed have not accumulated ice blockage that exceeds 15 percent of the total flow area through the ice bed region. The allowable 15 percent buildup of ice is based on the analysis of the sub-compartment response to a design basis LOCA with partial blockage of the ice condenser flow channels. The analysis did not perform detailed flow area modeling, but lumped the ice condenser bays into six sections ranging from 2.75 bays to 6.5 bays. Individual bays are acceptable with greater than 15 percent blockage, as long as 15 percent blockage is not exceeded for any analysis section.

To provide a 95 percent confidence that flow blockage does not exceed the allowed 15 percent, the visual inspection must be made for at least 54 (33 percent) of the 162 flow channels per ice condenser bay. The visual inspection of the ice bed flow channels is to inspect the flow area, by looking down from the top of the ice bed, and where view is achievable up from the bottom of the ice bed. Flow channels to be inspected are determined by random sample. As the most restrictive ice bed flow passage is found at a lattice frame elevation, the 15 percent blockage criteria only applies to "flow channels" that comprise the area:

a. between ice baskets, and

b. past lattice frames and wall panels.

Due to a significantly larger flow area in the regions of the upper deck grating and the lower inlet plenum support structures and turning vanes, a gross buildup of ice on these structures would be required to degrade air and steam flow. Therefore, these structures are excluded as part of a flow channel for application of the 15 percent blockage criteria. Industry experience has shown that removal of ice from the excluded structures during the refueling outage is sufficient to ensure they remain OPERABLE throughout the operating cycle. Removal of any gross ice buildup on the excluded structures is performed following outage maintenance activities.

Operating experience has demonstrated that the ice bed is the region that is the most flow restrictive, due to the normal presence of ice accumulation on lattice frames and wall panels. The flow area through the ice basket support platform is not a more restrictive flow area because it is easily accessible from the lower plenum and is maintained clear of ice accumulation. There is no mechanistically credible method for ice to

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ICE

BASES

SURVEILLANCE REQUIREMENTS (continued)

accumulate on the ice basket support platform during plant operation. Plant and industry experience has shown that the vertical flow area through the ice basket support platform remains clear of ice accumulation that could produce blockage. Normally only a glaze may develop or exist on the ice basket support platform which is not significant to blockage of flow area. Additionally, outage maintenance practices provide measures to clear the ice basket support platform following maintenance activities of any accumulation of ice that could block flow areas.

Frost buildup or loose ice is not to be considered as flow channel blockage, whereas attached ice is considered blockage of a flow channel. Frost is the solid form of water that is loosely adherent, and can be brushed off with the open hand.

12 4

SR 3.6.15.5 11 1

Verifying the chemical composition of the stored ice ensures that the stored ice has a boron concentration ≥ [1800] ppm and ≤ [2000] 2500 ppm as sodium tetraborate and a high pH, ≥ [9.0] and ≤ [9.5], in order to meet the requirement for borated water when the melted ice is used in the ECCS recirculation mode of operation. Additionally, the minimum boron concentration value is used to assure reactor subcriticality in a post LOCA environment, while the maximum boron concentration is used as the bounding value in the hot leg switchover timing calculation (Ref. 3). This is accomplished by obtaining at least 24 ice samples. Each sample is taken approximately one foot from the top of the ice of each randomly selected ice basket in each ice condenser bay. The SR is modified by a Note that allows the boron concentration and pH value obtained from averaging the individual samples' analysis results to satisfy the requirements of the SR. If either the average boron concentration or average pH value is outside their prescribed limit, then entry into Condition A is required. Sodium tetraborate has been proven effective in maintaining the boron content for long storage periods, and it also enhances the ability of the solution to remove and retain fission product iodine. The high pH is required to enhance the effectiveness of the ice and the melted ice in removing iodine from the containment atmosphere. This pH range also minimizes the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to ECCS and Containment Spray System fluids in the recirculation mode of operation. 2

STET [The Frequency of [54] months is intended to be consistent with the expected length of three fuel cycles, and was developed considering these facts: 8

1

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

a. Long term ice storage tests have determined that the chemical composition of the stored ice is extremely stable,

b. There are no normal operating mechanisms that decrease the boron concentration of the stored ice, and pH remains within a 9.0-9.5 range when boron concentrations are above approximately 1200 ppm,

STET

c. Operating experience has demonstrated that meeting the boron concentration and pH requirements has never been a problem, and

d. Someone would have to enter the containment to take the sample, and, if the unit is at power, that person would receive a radiation dose.

OR

8

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
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SR 3.6.15.6 5

11 1

This SR ensures that a representative sampling of ice baskets, which are relatively thin walled, perforated cylinders, have not been degraded by wear, cracks, corrosion, or other damage. The SR is designed around a full-length inspection of a sample of baskets, and is intended to monitor the effect of the ice condenser environment on ice baskets. The groupings defined in the SR (two baskets in each azimuthal third of the ice bed) ensure that the sampling of baskets is reasonably distributed. [The Frequency of 40 months for a visual inspection of the structural soundness of the ice baskets is based on engineering judgment and considers such factors as the thickness of the basket walls relative to corrosion rates expected in their service environment and the results of the long term ice storage testing.

STET

8

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

OR 8

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

------------------------------REVIEWER'S NOTE------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 9

SR 3.6.15.7 12 6 11 1

This SR ensures that initial ice fill and any subsequent ice additions meet the boron concentration and pH requirements of SR 3.6.15.5. 12 4 The SR is modified by a Note that allows the chemical analysis to be performed on either the liquid or resulting ice of each sodium tetraborate solution prepared. If ice is obtained from offsite sources, then chemical analysis data must be obtained for the ice supplied.

REFERENCES

1. U FSAR, Section [6.2]. 4 2

2. 10 CFR 50, Appendix K.

3. [Westinghouse letter, WAT-D-10686, "Upper Limit Ice Boron Concentration In Safety Analysis."] INSERT 1 2 11 2

4. Topical Report ICUG-001, "Application of the Active Ice Mass Management (AIMM) Concept to the Ice Condenser Ice Mass Technical Specifications," Revision 3, September 2003. 11

5. NRC Letter dated September 11, 2003, "Safety Evaluation for Ice Condenser Utility Group Topical Report No. ICUG-001, Revision 2 RE: Application of the Active Ice Mass Management Concept to the Ice Condenser Ice Mass Technical Specification (TAC No. MB3379)." 11

3 **INSERT 1** 2 11

Sequoyah Nuclear Plant Units 1 and 2 – Nuclear Steam Supply System Engineering Support Services – Contract 99NAN-251787 – Letter N9873, Contract Work Authorization N20000 020 – Tritium Production Core – Post Loss of Coolant Accident (LOCA) Long Term Core Cooling Analysis – N2N 058, dated August 13, 2001.

ICE

CSS-022

B 3.6 CONTAINMENT SYSTEMS

B 3.6.15 Ice Bed (Ice Condenser)

12

2,247,250

1,916,000

2,187,250

11

BASES

BACKGROUND

The ice bed consists of a minimum of [2,200,000] lb of ice stored within the ice condenser. The primary purpose of the ice bed is to provide a large heat sink in the event of a release of energy from a Design Basis Accident (DBA) in containment. The ice would absorb energy and limit containment peak pressure and temperature during the accident transient. Limiting the pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

degrees

The ice condenser is an annular compartment enclosing approximately 300° of the perimeter of the upper containment compartment, but penetrating the operating deck so that a portion extends into the lower containment compartment. The lower portion has a series of hinged doors exposed to the atmosphere of the lower containment compartment, which, for normal unit operation, are designed to remain closed. At the top of the ice condenser is another set of doors exposed to the atmosphere of the upper compartment, which also remain closed during normal unit operation. Intermediate deck doors, located below the top deck doors, form the floor of a plenum at the upper part of the ice condenser. These doors also remain closed during normal unit operation. The upper plenum area is used to facilitate surveillance and maintenance of the ice bed.

1944

The ice baskets contain the ice within the ice condenser. The ice bed is considered to consist of the total volume from the bottom elevation of the ice baskets to the top elevation of the ice baskets. The ice baskets position the ice within the ice bed in an arrangement to promote heat transfer from steam to ice. This arrangement enhances the ice condenser's primary function of condensing steam and absorbing heat energy released to the containment during a DBA.

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the top deck doors to open, which allows the air to flow out of the ice condenser into the upper compartment. Steam condensation within the ice condenser limits the pressure and temperature buildup in containment. A divider barrier (i.e., operating deck and extensions thereof) separates the upper and lower compartments and ensures that the steam is directed into the ice condenser.

BASES

BACKGROUND (continued)

The ice, together with the containment spray, is adequate to absorb the initial blowdown of steam and water from a DBA and the additional heat loads that would enter containment during several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves ~~to equalize pressures in containment and~~ to continue circulating heated air and steam from the lower compartment through the ice condenser where the heat is removed by the remaining ice. 4

As ice melts, the water passes through the ice condenser floor drains into the lower compartment. Thus, a second function of the ice bed is to be a large source of borated water (via the containment sump) for long term Emergency Core Cooling System (ECCS) and Containment Spray System heat removal functions in the recirculation mode.

A third function of the ice bed and melted ice is to remove fission product iodine that may be released from the core during a DBA. Iodine removal occurs during the ice melt phase of the accident and continues as the melted ice is sprayed into the containment atmosphere by the Containment Spray System. The ice is adjusted to an alkaline pH that facilitates removal of radioactive iodine from the containment atmosphere. ~~The alkaline pH also minimizes the occurrence of the chloride and caustic stress corrosion on mechanical systems and components exposed to ECCS and Containment Spray System fluids in the recirculation mode of operation.~~ 5

It is important for ice to exist in the ice baskets, the ice to be appropriately distributed around the 24 ice condenser bays, and for open flow paths to exist around ice baskets. This is especially important during the initial blowdown so that the steam and water mixture entering the lower compartment do not pass through only part of the ice condenser, depleting the ice there while bypassing the ice in other bays.

Two phenomena that can degrade the ice bed during the long service period are:

a. Loss of ice by melting or sublimation [;] and 6

b. Obstruction of flow passages through the ice bed due to buildup of ice.

BASES

BACKGROUND (continued)

Both of these degrading phenomena are reduced by minimizing air leakage into and out of the ice condenser.

The ice bed limits the temperature and pressure that could be expected following a DBA, thus limiting leakage of fission product radioactivity from containment to the environment.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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 not assumed to occur simultaneously or consecutively.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed in regards to containment Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train ~~each~~ of the Containment Spray System and one ARS fan being inoperable. 7

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. For certain aspects of the transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the cooling effectiveness of the ECCS 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. 2).

The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5, "Containment Air Temperature."

In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The ice bed satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The ice bed LCO requires the existence of the required quantity of stored ice, appropriate distribution of the ice ~~and~~ within the ice bed, open flow paths through the ice bed, and appropriate chemical content and pH of the stored ice. The stored ice functions to absorb heat during the blowdown phase and long term phase of a DBA, thereby limiting containment air temperature and pressure. The chemical content and pH of the stored ice provide core SDM (boron content) and remove radioactive iodine from the containment atmosphere when the melted ice is recirculated through the ECCS and the Containment Spray System, respectively. 6

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the operation of the ice bed. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ice bed is not required to be OPERABLE in these MODES.

ACTIONS

A.1

If the ice bed is inoperable, it must be restored to OPERABLE status within 48 hours. The Completion Time was developed based on operating experience, which confirms that due to the very large mass of stored ice, the parameters comprising OPERABILITY do not change appreciably in this time period. ~~Because of this fact, the Surveillance Frequencies are long (months), except for the ice bed temperature, which is checked every 12 hours.~~ If a degraded condition is identified, even for temperature, with such a large mass of ice it is not possible for the degraded condition to significantly degrade further in a 48 hour period. Therefore, 48 hours is a reasonable amount of time to correct a degraded condition before initiating a shutdown. 8

B.1 and B.2

If the ice bed 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.

1

BASES 12 ICE

1

SURVEILLANCE REQUIREMENTS

SR 3.6.15.1

Verifying that the maximum temperature of the ice bed is ≤ [27]°F ensures that the ice is kept well below the melting point. [The 12 hour Frequency was based on operating experience, which confirmed that, due to the large mass of stored ice, it is not possible for the ice bed temperature to degrade significantly within a 12 hour period and was also based on assessing the proximity of the LCO limit to the melting temperature.

2

STET

Furthermore, the 12 hour Frequency is considered adequate in view of indications in the control room, including the alarm, to alert the operator to an abnormal ice bed temperature condition. This SR may be satisfied by use of the Ice Bed Temperature Monitoring System.

8

OR

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

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

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12

SR 3.6.15.2

1

11

INSERT 1

Ice mass determination methodology is designed to verify the total as-found (pre-maintenance) mass of ice in the ice bed, and the appropriate distribution of that mass, using a random sampling of individual baskets. The random sample will include at least 30 baskets from each of three defined Radial Zones (at least 90 baskets total). Radial Zone A consists of baskets located in rows [7, 8, and 9] (innermost rows adjacent to the crane wall), Radial Zone B consists of baskets located in rows [4, 5, and 6] (middle rows of the ice bed), and Radial Zone C consists of baskets located in rows [1, 2, and 3] (outermost rows adjacent to the containment vessel).

1, 2, and 3

7, 8, and 9

2

The Radial Zones chosen include the row groupings nearest the inside and outside walls of the ice bed and the middle rows of the ice bed. These groupings facilitate the statistical sampling plan by creating sub-populations of ice baskets that have similar mean mass and sublimation characteristics.

ICE

INSERT 1

11

The minimum weight figure of 1145 pounds of ice per basket contains a 15% conservative allowance for ice loss through sublimation which is a factor of 15 higher than assumed for the ice condenser design. The minimum weight figure of 2,225,880 pounds of ice also contains an additional 1% conservative allowance to account for systematic error in weighing instruments.

The Frequency of 18 months was based on ice storage tests and the allowance built into the required ice mass over and above the mass assumed in the safety analyses. Operating experience has verified that, with the 18-month Frequency, the weight requirements are maintained with no significant degradation between surveillances.

ICE

BASES

SURVEILLANCE REQUIREMENTS (continued)

11

Methodology for determining sample ice basket mass will be either by direct lifting or by alternative techniques. Any This method chosen will include procedural allowances for the accuracy of the method used. [The number of sample baskets in any Radial Zone may be increased one once by adding 20 or more randomly selected baskets to verify the total mass of that Radial Zone.] 10 2 2

In the event the mass of a selected basket in a sample population (initial or expanded) cannot be determined by any available means (e.g., due to surface ice accumulation or obstruction), a randomly selected representative alternate basket may be used to replace the original selection in that sample population. If employed, the representative alternate must meet the following criteria:

a. Alternate selection must be from the same bay-Zone (i.e., same bay, same Radial Zone) as the original selection, and

b. Alternate selection cannot be a repeated selection (original or alternate) in the current Surveillance, and cannot have been used as an analyzed alternate selection in the three most recent Surveillances.

The complete basis for the methodology used in establishing the 95% confidence level in the total ice bed mass is documented in Reference 4 and approved in Reference 5.

The total ice mass and individual Radial Zone ice mass requirements defined in this Surveillance, and the minimum ice mass per basket requirement defined by SR 3.6.15.3, are the minimum requirements for OPERABILITY. Additional ice mass beyond the SRs is maintained to address sublimation. This sublimation allowance is generally applied to baskets in each Radial Zone, as appropriate, at the beginning of an operating cycle to ensure sufficient ice is available at the end of the operating cycle for the ice condenser to perform its intended design function. 12 1

STET

[The Frequency of 18 months was based on ice storage tests, and the typical sublimation allowance maintained in the ice mass over and above the minimum ice mass assumed in the safety analyses. Operating and maintenance experience has verified that, with the 18 month Frequency, the minimum mass and distribution requirements in the ice bed are maintained. 8

OR

1

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 8

-------------------------------REVIEWER'S NOTE-------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 9 11

12

SR 3.6.15.3 1

12

Verifying that each selected sample basket from SR 3.6.15.2 contains at least 600 lbs of ice in the as-found (pre-maintenance) condition ensures that a significant localized degraded mass condition is avoided.

This SR establishes a per basket limit to ensure any ice mass degradation is consistent with the initial conditions of the DBA by not significantly affecting the containment pressure response. Reference 4 provides insights through sensitivity runs that demonstrate that the containment peak pressure during a DBA is not significantly affected by the ice mass in a large localized region of baskets being degraded below the required safety analysis mean, when the Radial Zone and total ice mass requirements of SR 3.6.15.2 are satisfied. Any basket identified as containing less than 600 lbs of ice requires appropriately entering the TS Required Action for an inoperable ice bed due to the potential that it may represent a significant condition adverse to quality. 12 1

CSS-022

As documented in Reference 4, maintenance practices actively manage individual ice basket mass above the required safety analysis mean for each Radial Zone. Specifically, each basket is serviced to keep its ice mass above [1132] lbs for Radial Zone A, [1132] lbs for Radial Zone B, and [1132] lbs for Radial Zone C. If a basket sublimates below the safety analysis mean value, this instance is identified within the plant's corrective action program, including evaluating maintenance practices to identify the cause and correct any deficiencies. These maintenance practices provide defense in depth beyond compliance with the ice bed Surveillance Requirements by limiting the occurrence of individual baskets with ice mass less than the required safety analysis mean. 2

1156 1125.13
1156 1125.13

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~15~~.4 12 3 11

This SR ensures that the flow channels through the ice bed have not accumulated ice blockage that exceeds 15 percent of the total flow area through the ice bed region. The allowable 15 percent buildup of ice is based on the analysis of the sub-compartment response to a design basis LOCA with partial blockage of the ice condenser flow channels. The analysis did not perform detailed flow area modeling, but lumped the ice condenser bays into six sections ranging from 2.75 bays to 6.5 bays. Individual bays are acceptable with greater than 15 percent blockage, as long as 15 percent blockage is not exceeded for any analysis section.

To provide a 95 percent confidence that flow blockage does not exceed the allowed 15 percent, the visual inspection must be made for at least 54 (33 percent) of the 162 flow channels per ice condenser bay. The visual inspection of the ice bed flow channels is to inspect the flow area, by looking down from the top of the ice bed, and where view is achievable up from the bottom of the ice bed. Flow channels to be inspected are determined by random sample. As the most restrictive ice bed flow passage is found at a lattice frame elevation, the 15 percent blockage criteria only applies to "flow channels" that comprise the area:

a. between ice baskets, and

b. past lattice frames and wall panels.

Due to a significantly larger flow area in the regions of the upper deck grating and the lower inlet plenum support structures and turning vanes, a gross buildup of ice on these structures would be required to degrade air and steam flow. Therefore, these structures are excluded as part of a flow channel for application of the 15 percent blockage criteria. Industry experience has shown that removal of ice from the excluded structures during the refueling outage is sufficient to ensure they remain OPERABLE throughout the operating cycle. Removal of any gross ice buildup on the excluded structures is performed following outage maintenance activities.

Operating experience has demonstrated that the ice bed is the region that is the most flow restrictive, due to the normal presence of ice accumulation on lattice frames and wall panels. The flow area through the ice basket support platform is not a more restrictive flow area because it is easily accessible from the lower plenum and is maintained clear of ice accumulation. There is no mechanistically credible method for ice to

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BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

accumulate on the ice basket support platform during plant operation. Plant and industry experience has shown that the vertical flow area through the ice basket support platform remains clear of ice accumulation that could produce blockage. Normally only a glaze may develop or exist on the ice basket support platform which is not significant to blockage of flow area. Additionally, outage maintenance practices provide measures to clear the ice basket support platform following maintenance activities of any accumulation of ice that could block flow areas.

Frost buildup or loose ice is not to be considered as flow channel blockage, whereas attached ice is considered blockage of a flow channel. Frost is the solid form of water that is loosely adherent, and can be brushed off with the open hand.

12 4 11 1

SR 3.6.15.5

Verifying the chemical composition of the stored ice ensures that the stored ice has a boron concentration ≥ [1800] ppm and ≤ [2000] 2500 ppm as sodium tetraborate and a high pH, ≥ [9.0] and ≤ [9.5], in order to meet the requirement for borated water when the melted ice is used in the ECCS recirculation mode of operation. Additionally, the minimum boron concentration value is used to assure reactor subcriticality in a post LOCA environment, while the maximum boron concentration is used as the bounding value in the hot leg switchover timing calculation (Ref. 3). This is accomplished by obtaining at least 24 ice samples. Each sample is taken approximately one foot from the top of the ice of each randomly selected ice basket in each ice condenser bay. The SR is modified by a Note that allows the boron concentration and pH value obtained from averaging the individual samples' analysis results to satisfy the requirements of the SR. If either the average boron concentration or average pH value is outside their prescribed limit, then entry into Condition A is required. Sodium tetraborate has been proven effective in maintaining the boron content for long storage periods, and it also enhances the ability of the solution to remove and retain fission product iodine. The high pH is required to enhance the effectiveness of the ice and the melted ice in removing iodine from the containment atmosphere. This pH range also minimizes the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to ECCS and Containment Spray System fluids in the recirculation mode of operation. [The Frequency of [54] months is intended to be consistent with the expected length of three fuel cycles, and was developed considering these facts: 2

STET 8

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

STET

a. Long term ice storage tests have determined that the chemical composition of the stored ice is extremely stable,

b. There are no normal operating mechanisms that decrease the boron concentration of the stored ice, and pH remains within a 9.0-9.5 range when boron concentrations are above approximately 1200 ppm,

c. Operating experience has demonstrated that meeting the boron concentration and pH requirements has never been a problem, and

d. Someone would have to enter the containment to take the sample, and, if the unit is at power, that person would receive a radiation dose.

OR

8

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

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

9

12 5 11 1

SR 3.6.15.6

This SR ensures that a representative sampling of ice baskets, which are relatively thin walled, perforated cylinders, have not been degraded by wear, cracks, corrosion, or other damage. The SR is designed around a full-length inspection of a sample of baskets, and is intended to monitor the effect of the ice condenser environment on ice baskets. The groupings defined in the SR (two baskets in each azimuthal third of the ice bed) ensure that the sampling of baskets is reasonably distributed. [The Frequency of 40 months for a visual inspection of the structural soundness of the ice baskets is based on engineering judgment and considers such factors as the thickness of the basket walls relative to corrosion rates expected in their service environment and the results of the long term ice storage testing.

STET 8

1

BASES ICE

SURVEILLANCE REQUIREMENTS (continued)

OR

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. 8

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
-----] 9

12 6

SR 3.6.15.7 11 1

12 4

This SR ensures that initial ice fill and any subsequent ice additions meet the boron concentration and pH requirements of SR 3.6.15.5. The SR is modified by a Note that allows the chemical analysis to be performed on either the liquid or resulting ice of each sodium tetraborate solution prepared. If ice is obtained from offsite sources, then chemical analysis data must be obtained for the ice supplied.

REFERENCES

1. U FSAR, Section [6.2]. 4 2

2. 10 CFR 50, Appendix K.

3. [Westinghouse letter, WAT-D-10686, "Upper Limit Ice Boron Concentration In Safety Analysis."] INSERT 1 2 — 2 11

4. Topical Report ICUG-001, "Application of the Active Ice Mass Management (AIMM) Concept to the Ice Condenser Ice Mass Technical Specifications," Revision 3, September 2003. 11

5. NRC Letter dated September 11, 2003, "Safety Evaluation for Ice Condenser Utility Group Topical Report No. ICUG-001, Revision 2 RE: Application of the Active Ice Mass Management Concept to the Ice Condenser Ice Mass Technical Specification (TAC No. MB3379)." 11

3 **INSERT 1** 2 11

Sequoyah Nuclear Plant Units 1 and 2 – Nuclear Steam Supply System Engineering Support Services – Contract 99NAN-251787 – Letter N9873, Contract Work Authorization N20000 020 – Tritium Production Core – Post Loss of Coolant Accident (LOCA) Long Term Core Cooling Analysis – N2N 058, dated August 13, 2001.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.12 BASES, ICE BED

ICE

1. The heading and title for ISTS 3.6.15 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS, and ISTS 3.6.15 is renumbered as ITS 3.6.12.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

3. Changes are made to provide clarity concerning the extent of the perimeter of the upper containment that the ice condenser encloses.

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

5. Corrosion protection at SQN does not take credit for the alkaline pH of the ice bed for minimizing chloride and caustic stress corrosion on mechanical systems and components exposed to ECCS and Containment Spray System fluid in the recirculation mode of operation.

6. Typographical/grammatical error corrected.

7. The SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans."

8. ISTS SR 3.6.15.1, SR 3.6.15.2, SR 3.6.15.3, SR 3.6.15.4, SR 3.6.15.5, SR 3.6.15.6, and SR 3.6.15.7 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to ~~control the Surveillance Frequencies for ITS SR 3.6.12.1, SR 3.6.12.2, SR 3.6.12.3, SR 3.6.12.4, SR 3.6.12.5, SR 3.6.12.6, and SR 3.6.12.7 under the Surveillance Frequency Control Program.~~

retain the current Surveillance Frequencies in the ITS.

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

10. ~~The direct lifting alternate techniques discussion has been removed, as SQN does not plan to use any technique to determine ice basket weight, other than direct lifting of the ice basket.~~

Not Used

11. Changes are made to ISTS 3.6.15 Bases which reflect the SQN current Technical Specification Ice Bed Operability requirements, SR testing requirements and SR testing methodology. SR numbers have been changed to reflect the removal of ISTS SR 3.6.15.3. Minimal Ice weight in the background section has been changed to reflect the minimal acceptable limit without consideration for sublimation and 1% error factor.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.12, ICE BED

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 13

ITS 3.6.13, ICE CONDENSER DOORS

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

ITS 3.6.13

A01

CONTAINMENT SYSTEMS

ICE CONDENSER DOORS

LIMITING CONDITION FOR OPERATION

LCO 3.6.13 3.6.5.3 The ice condenser inlet doors, intermediate deck doors, and top deck doors shall be closed and OPERABLE.

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

ACTION: [Add ACTIONS Note 1] L01 [Add ACTIONS Note 2] L02

ACTION A / ACTION D a. With one or more ice condenser inlet doors inoperable due to being physically restrained from opening, restore all inlet doors to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

CSS-027

Stet

ACTION B / ACTION D / ACTION C b. With one or more ice condenser doors open or otherwise inoperable for reasons other than action a., POWER OPERATION may continue for up to 14 days provided the ice bed temperature is monitored at least once per 4 hours and the maximum ice bed temperature is maintained less than or equal to 27°F; ~~otherwise, restore the doors to their closed positions or OPERABLE status (as applicable) within 48 hours~~ or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

~~Add proposed Condition C~~ ~~M01~~

CSS-029

SURVEILLANCE REQUIREMENTS

Stet

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be:

~~L03~~

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, [~~every 12 hours~~] and

LA01 [In accordance with the Surveillance Frequency Control Program]

b. Demonstrated OPERABLE at least ~~once per 18 months~~ by:

CSS-030

SR 3.6.13.4 1. Verifying that the torque required to initially open each door is less than or equal to 675 inch pounds.

A02

SR 3.6.13.3 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction.

SR 3.6.13.5 3. [Perform a torque test of] ~~Verifying that the torque required to open~~ each door ~~is less than 195 inch-pounds when the door is 40 degrees open. This torque is defined as the "door opening torque" and is equal to the nominal door torque plus a frictional torque component.~~

LA02

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A01

CONTAINMENT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4. Verifying that the torque required to keep each door from closing is greater than 78 inch-pounds when the door is 40 degrees open. This torque is defined as the "door closing torque" and is equal to the nominal door torque minus a frictional torque component.

5. Calculation of the frictional torque of each door tested in accordance with 3 and 4, above. The calculated frictional torque shall be less than or equal to 40 inch-pounds.

LA02

4.6.5.3.2 Intermediate Deck Doors - Each ice condenser intermediate deck door shall be:

M02: , ice, and debris

SR 3.6.13.2 a. Verified closed and free of frost accumulation by a visual inspection at least once per 7 days, and

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.6.13.6 b. Demonstrated OPERABLE at least once per 18 months by visually verifying no structural deterioration, by verifying free movement of the vent assemblies, and by ascertaining free movement when lifted with the applicable force shown below:

Door	Lifting Force
0-1, 0-5	Less than or equal to 37.4 lbs.
0-2, 0-6	Less than or equal to 33.8 lbs.
0-3, 0-7	Less than or equal to 31.0 lbs.
0-4, 0-8	Less than or equal to 31.8 lbs.

LA03

SR 3.6.13.7 4.6.5.3.3 Top Deck Doors - Each ice condenser top deck door shall be determined closed and OPERABLE at least once per 92 days by visually verifying:

In accordance with the Surveillance Frequency Control Program

LA01

a. That the doors are in place, and

b. That no condensation, frost, or ice has formed on the doors or blankets which would restrict their lifting and opening if required.

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CONTAINMENT SYSTEMS

INLET DOOR POSITION MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.5.4 This specification is deleted.

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A01

CONTAINMENT SYSTEMS

ICE CONDENSER DOORS

LIMITING CONDITION FOR OPERATION

LCO 3.6.13 — 3.6.5.3 The ice condenser inlet doors, intermediate deck doors, and top deck doors shall be closed and OPERABLE.

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

ACTION: [Add ACTIONS Note 1 — L01] [Add ACTIONS Note 2 — L02]

ACTION A / ACTION D — a. With one or more ice condenser inlet doors inoperable due to being physically retrained from opening, restore all inlet doors to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

CSS-027

ACTION B / ACTION D / ACTION C — b. With one or more ice condenser doors open or otherwise inoperable for reasons other than action a., POWER OPERATION may continue for up to 14 days provided the ice bed temperature is monitored at least once per 4 hours and the maximum ice bed temperature is maintained less than or equal to 27°F; ~~otherwise, restore the doors to their closed positions or OPERABLE status (as applicable) within 48 hours~~ or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Stet

[~~Add proposed Condition C~~ — ~~M01~~]

CSS-029

SURVEILLANCE REQUIREMENTS

Stet

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be: [~~L03~~]

SR 3.6.13.1 — a. ~~Continuously monitored and~~ determined closed, and [~~every 12 hours~~]

b. Demonstrated OPERABLE ~~at least once per 18 months~~ by: [In accordance with the Surveillance Frequency Control Program — LA01]

SR 3.6.13.4 — 1. Verifying that the torque required to initially open each door is less than or equal to 675 inch pounds.

CSS-030

SR 3.6.13.3 — 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction.

A02

SR 3.6.13.5 — 3. [Perform a torque test of] ~~Verifying that the torque required to open~~ each door ~~is less than 195 inch-pounds when the door is 40 degrees open. This torque is defined as the "door opening torque" and is equal to the nominal door torque plus a frictional torque component.~~ [LA02]

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4. ~~Verifying that the torque required to keep each door from closing is greater than 78 inch-pounds when the door is 40 degrees open. This torque is defined as the "door closing torque" and is equal to the nominal door torque minus a frictional torque component.~~

5. ~~Calculation of the frictional torque of each door tested in accordance with 3 and 4, above. The calculated frictional torque shall be less than or equal to 40 inch-pounds.~~

LA02

4.6.5.3.2 Intermediate Deck Doors - Each ice condenser intermediate deck door shall be:

M02: , ice, and debris

SR 3.6.13.2 a. Verified closed and free of frost accumulation by a visual inspection ~~at least once per 7 days~~, and

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.6.13.6 b. Demonstrated OPERABLE ~~at least once per 18 months~~ by visually verifying no structural deterioration, by verifying free movement of the vent assemblies, and by ascertaining free movement ~~when lifted with the applicable force shown below:~~

~~Door~~	~~Lifting Force~~
~~0-1, 0-5~~	~~≤ 37.4 lbs.~~
~~0-2, 0-6~~	~~≤ 33.8 lbs.~~
~~0-3, 0-7~~	~~≤ 31.0 lbs.~~
~~0-4, 0-8~~	~~≤ 31.8 lbs.~~

LA03

SR 3.6.13.7 4.6.5.3.3 Top Deck Doors - Each ice condenser top deck door shall be determined closed and OPERABLE ~~at least once per 92 days~~ by visually verifying:

In accordance with the Surveillance Frequency Control Program

LA01

a. That the doors are in place, and

b. That no condensation, frost, or ice has formed on the doors or blankets which would restrict their lifting and opening if required.

ITS

3.6.13

A01

CONTAINMENT SYSTEMS

INLET DOOR POSITION MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.5.4 This specification is deleted.

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DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

Insert A02

CSS-030

MORE RESTRICTIVE CHANGES

~~M01~~ ~~CTS 3.6.5.3, Action b. allows continued unit power operation for up to 14 days with one of more ice condenser doors open or inoperable for reasons other than the door is physically restrained from opening, provided the ice bed temperature is verified to not exceed 27°F every 4 hours. Otherwise, the ice condenser door shall be restored to its closed position or OPERABLE status within 48 hours (as applicable), or the unit shall be in hot standby within 6 hours and cold shutdown in 36 hours. ITS 3.6.13, Condition B is entered when one of more ice condenser doors are open or inoperable for reasons other than the door is physically restrained from opening. In this Condition, ice bed temperature is verified to not exceed 27°F once per 4 hours, and the inoperable ice condenser door(s) is required to be in the closed position and restored to an OPERABLE status within 14 days. If the inoperable or open ice condenser door is not closed and restored to an OPERABLE status within 14 days, the unit shall be in MODE 3 in 6 hours and MODE 5 in 36 hours. If ice bed temperature exceeds 27°F, Required Action C.1 requires entry into the applicable Conditions and Required Actions of LCO 3.6.12, "Ice Bed." This changes the CTS by removing the 48 hour allowance to restore or close the ice condenser door after the 14 day allowed outage time has expired. Additionally, entry into the applicable Condition and Required Actions of LCO 3.6.12 are being specified for an inoperable ice bed.~~

Not Used

CSS-027

~~The purpose of the CTS 3.6.5.3 Actions is to minimize the time the unit is operating with inoperable or open ice condenser doors. This change is acceptable, because it is consistent with the assumption made for continued operation under the condition of an open or inoperable ice condenser door that could impact the OPERABILITY of the ice bed. The Completion Time to restore a door in this condition is 14 days. In addition, during this 14 day period, the ice bed temperature must be verified to be less than or equal to 27°F once every 4 hours. Therefore, the Completion Time of 14 days is appropriate, since during this time the ice bed is verified OPERABLE by ensuring the ice bed temperature is less than or equal to 27°F. Additionally, if during the 14 day allowed outage time the ice bed temperature is found to exceed 27°F, the appropriate ACTIONS to take for an inoperable ice bed are contained in ITS LCO 3.6.12. This change is designated as more restrictive, because more stringent Required Actions are being applied in the ITS than were applied in the CTS.~~

Insert DOC A02

CSS-030

CTS 4.6.5.3.1.b.2 states, "Inlet Doors - Ice condenser inlet doors shall be demonstrated OPERABLE at least once per 18 months by verifying that opening of each door is not impaired by ice, frost, debris, or obstruction." ITS SR 3.6.13.3 states, "Verify, by visual inspection, each inlet door is not impaired by ice, frost, or debris." This changes the CTS by specifying the test is a visual inspection of each inlet door for impairment.

The purpose of CTS 4.6.5.3.1.b.2 is to verify that ice condenser inlet door opening is not impaired. However, CTS 4.6.5.3.1.b.2 is not a test that requires the inlet door to be opened to ensure impairment is not present. CTS 4.6.5.3.1.b.1 verifies that the torque required to initially open each door is less than or equal to 675 inch pounds. CTS 4.6.5.3.1.b.1 and b.2 are both required to be performed on a 18 month frequency. CTS 4.6.5.3.1.b.1 verifies the ice condenser inlet doors open at less than 675 inch pounds and CTS 4.6.5.3.1.b.2 verifies the inlet door is not impaired. Therefore, CTS 4.6.5.3.1.b.2 and ITS SR 3.6.13.3 require the same type of verification that the inlet door is not impaired from opening. This change is designated as administrative because it does not result in technical changes to the CTS.

DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

M02 CTS 4.6.5.6.2.a requires verification, by visual inspection, that each intermediate deck door is closed and free of frost accumulation. ITS SR 3.6.13.2 adds the additional requirements to visually verify that each intermediate deck door is not impaired by ice or debris. This changes the CTS by adding additional visual inspection requirements for the intermediate deck door Surveillance.

The purpose of the additional visual inspection requirements of ITS SR 3.6.13.2 is to ensure each intermediate deck door is not obstructed from opening. This change is acceptable, because it provides additional assurance that the intermediate deck doors will be capable of performing their safety functions. This change is designated as more restrictive, because it adds visual inspection requirements to the intermediate deck door Surveillance.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.5.3.1.a requires the ice condenser inlet doors to be continuously monitored and determined to be closed. (See DOC L03 for frequency change to 12 hours). ITS SR 3.6.13.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.1.b.1 requires verification that the initial opening torque of the ice condenser inlet doors is within limit at least once per 18 months. ITS SR 3.6.13.4 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.1.b.2 requires verification that the opening of the ice condenser inlet doors is not impaired by ice, frost, debris, or obstruction at least once per 18 months. ITS SR 3.6.13.3 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.1.b.3 through 4.6.5.3.1.b.5 require the performance torque testing for each ice condenser inlet door at least once per 18 months. ITS SR 3.6.13.5 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.2.a requires visual verification that each ice condenser intermediate deck door is closed and free of frost accumulation at least once per 7 days. ITS SR 3.6.13.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.2.b requires demonstrating the OPERABILITY of each ice condenser intermediate deck door by visually verifying no structural deterioration, verifying free movement of the vent assemblies, and by ascertaining free movement of the door when lifted with the specified force at least once per 18 months. ITS SR 3.6.13.6 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.3.3.a and 4.6.5.3.3.b require verification that the each ice condenser top deck door is closed by verifying the door is in place, and that no condensation, frost, or ice has formed on the doors or blankets

DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

which could restrict its lifting and opening at least once per 92 days. ITS SR 3.6.13.7 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.6.5.3.1.b.3 requires testing each ice condenser inlet door and verifying that the torque required to open the door is less than 195 inch-pounds when the door is 40 degrees open. This torque is defined as the "door opening torque" and is equal to the nominal door torque plus a frictional torque component. CTS 4.6.5.3.1.b.4 requires testing each ice condenser inlet door and verifying that the torque required to keep the door from closing is greater than 78 inch-pounds when the door is 40 degrees open. This torque is defined as the "door closing torque" and is equal to the nominal door torque plus a frictional torque component. CTS 4.6.5.3.1.b.5 requires a calculation of the frictional torque of each door tested in accordance with 3 and 4, above. The calculated frictional torque shall be less than or equal to 40 inch-pounds. ITS SR 3.6.13.5 requires the performance of a torque test on each ice condenser inlet door. This changes the CTS by moving the torque design limits and definitions to the Bases.

The removal of these details for performing a Surveillance Requirement 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 a torque test on the inlet doors. Also, this change is acceptable because the removed information will be adequately controlled in 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.

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DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

LA03 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.6.5.3.2.b requires an inspection of each ice condenser intermediate deck door by visually verifying no structural deterioration, by verifying free movement of the vent assemblies, and by ascertaining free movement when lifted with the specified force. CTS 4.6.5.3.2.b also lists the required lifting force for each ice condenser intermediate deck door. ITS SR 3.6.13.6 requires the same inspections. However, the door identifiers and associated lifting forces are not listed. This changes the CTS by moving the door identifiers and associated lifting forces to the Bases.

The removal of these details for performing a Surveillance Requirement 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 free movement of each intermediate door. 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 procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.6.5.3 provides Actions for inoperable ice condenser doors. ITS 3.6.13 provides similar ACTIONS, however a Note is added to the CTS Action (ITS 3.6.13 ACTIONS Note) that states, "Separate Condition entry is allowed for each ice condenser door." This modifies the CTS by providing a specific allowance to enter the Action for each ice condenser door separately.

The purpose of the CTS 3.6.5.3 Actions is to minimize the time the unit is operating with inoperable ice condenser doors. 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 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 repair period. ITS 3.6.13 ACTION A minimizes the time one or more ice condenser inlet doors are inoperable due to being physically restrained from opening. The Completion Time for restoration is one hour. ITS 3.6.13 ACTION B covers the condition of one or more ice condenser doors inoperable for reasons other than Condition A or not closed. The Completion Time to restore a door in this condition is 14 days. In addition, during this 14 day period, the ice bed temperature must be verified to be less than or equal to 27°F once every 4 hours. ITS 3.6.13 ACTION A minimizes the time the ice condenser doors are inoperable by being physically restrained from opening

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DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

and therefore, minimizes the time allowed to be outside the containment analysis assumptions. When operating in ITS 3.6.13 ACTION B, the ice bed is verified OPERABLE by ensuring the ice bed temperature is less than or equal to 27°F. Therefore, the Completion Time of 14 days is appropriate. The addition of the ITS 3.6.13 ACTIONS Note is acceptable, since the proposed compensatory actions minimize risk associated with continued operation while providing time to repair inoperable features. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.6.5.3 provides specific Actions to be taken if an ice condenser intermediate deck or top deck door is open or inoperable. ITS 3.6.13 ACTIONS Note 2 states that when an ice condenser intermediate deck or top deck door is inoperable for a short duration solely due to personnel standing on or opening the door to perform required Surveillances, minor preventative maintenance, or system walkdowns, entry into associated Conditions and Required Actions is not required. This changes the CTS by allowing an intermediate deck or top deck door to be inoperable for a short duration to perform routine evolutions without requiring entry into the associated Actions.

The purpose of the CTS 3.6.5.3 Action is to minimize the time the unit is operating with inoperable ice condenser doors. This change is acceptable, because the doors are inoperable only for short durations. Furthermore, the reasons for the inoperability are to either perform required Surveillances, perform preventative maintenance to improve reliability of the doors or ensure the doors do not become inoperable, or due to walking on or opening the doors for inspections. In addition, during this short duration, the ice bed temperature is normally continuously monitored (as described in the Bases). This helps to ensure that an ice bed temperature change due to an open door will be detected and appropriate actions taken (as required by ITS 3.6.12). Also, the number of doors walked on simultaneously (and therefore, potentially incapable of opening) is small when compared to the total number of doors. This change is designated as less restrictive, because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

~~L03~~ ~~*(Category 7 – Relaxation Of Surveillance Frequency)* CTS 4.6.5.3.1.a requires the ice condenser inlet doors to be "continuously monitored" and determined to be closed. ITS SR 3.6.13.1 requires verification that all ice condenser inlet doors are closed "In accordance with the Surveillance Frequency Control Program." The specified Surveillance Frequency that is being moved to the Surveillance Frequency Control Program is "12 hours." This changes the CTS by allowing the ice condenser inlet doors to be monitored less frequently. Moving the specified Surveillance Frequency to the Surveillance Frequency Control Program is discussed in DOC LA01.~~

Not Used

CSS-029

~~The purpose of CTS 4.6.5.3.1.a is to ensure the ice condenser inlet doors are closed. This change is acceptable because the new Surveillance Frequency will provide an acceptable level of equipment reliability. The inlet doors will open when there is significant pressure buildup in the containment lower compartment. During an accident this pressure buildup is generated by the energy introduced~~

DISCUSSION OF CHANGES
ITS 3.6.13, ICE CONDENSER DOORS

~~by the Reactor Coolant System blowdown or by operation of the Air Return System. During normal operation these conditions are not expected and the doors should remain closed. Therefore, the 12 hour Frequency is considered sufficient. This change is designated as less restrictive, because Surveillances will be performed less frequently under the ITS than under the CTS.~~ CSS-029

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

CTS

1

3.6 CONTAINMENT SYSTEMS

3.6.16 13 Ice Condenser Doors (Ice Condenser) 1

3.6.5.3 LCO 3.6.16 13 The ice condenser inlet doors, intermediate deck doors, and top deck [doors] shall be OPERABLE and closed. 3

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

ACTIONS

S

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

DOC L01 1. Separate Condition entry is allowed for each ice condenser door. INSERT 1 4

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
3.6.5.3.a	A. One or more ice condenser inlet doors inoperable due to being physically restrained from opening.	A.1	Restore inlet door to OPERABLE status.	1 hour	
3.6.5.3.b	B. One or more ice condenser doors inoperable for reasons other than Condition A or not closed.	B.1	Verify maximum ice bed temperature is ≤ [27]°F.	Once per 4 hours	3
		AND			
		B.2	Restore ice condenser door to OPERABLE status and closed positions.	14 days	5
3.6.5.3.b	C. Required Action B.1 and associated Completion Time of Condition B not met.	C.1	Restore ice condenser door to OPERABLE status and closed positions. INSERT 2 (Stet)	48 hours Immediately	6
3.6.5.3.b	D. Required Action and associated Completion Time of Condition A or C not met. INSERT 3	D.1	Be in MODE 3.	6 hours	CSS-027
		AND			
		D.2	Be in MODE 5.	36 hours	6

CTS

4 **INSERT 1**

DOC L02 2. When an ice condenser intermediate deck or top deck door is inoperable for a short duration solely due to personnel standing on or opening the door to perform required Surveillances, minor preventative maintenance, or system walkdowns, entry into ~~associated~~ Conditions ~~and Required Actions~~ is not required.

B

CSS-028

6 ~~**INSERT 2**~~

~~DOC M01~~

~~Enter the applicable Conditions and Required Actions of LCO 3.6.12, "Ice Bed," for ice bed temperature > 27°F.~~

CSS-027

6 ~~**INSERT 3**~~

~~OR~~

~~Required Action B.2 and associated Completion Time not met.~~

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SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.3.1.a	SR 3.6.16.1 13	Verify all inlet doors indicate are closed by the Inlet Door Position Monitoring System. Stet	[12 hours OR CSS-029 In accordance with the Surveillance Frequency Control Program]	7 1 8 8
4.6.5.3.2.a	SR 3.6.16.2 13	Verify, by visual inspection, each intermediate deck door is closed and not impaired by ice, frost, or debris.	[7 days OR In accordance with the Surveillance Frequency Control Program]	1 8 8
4.6.5.3.1.b.2	SR 3.6.16.3 13	Verify, by visual inspection, each inlet door is not impaired by ice, frost, or debris.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 8 8

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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.5.3.1.b.1	SR 3.6.16.4 (13)	Verify torque required to cause each inlet door to begin to open is ≤ [675] in-lb.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 3 8 8
4.6.5.3.1.b.3	SR 3.6.16.5 (13)	Perform a torque test on [a sampling of ≥ 25% of the] inlet doors. (each)	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 3 8 8

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CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.5.3.2.b	SR 3.6.16.6 13	Verify for each intermediate deck door: a. No visual evidence of structural deterioration, ; b. Free movement of the vent assemblies, ; and c. Free movement of the door.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 5 8 8
4.6.5.3.3.a 4.6.5.3.3.b	SR 3.6.16.7 13	Verify, by visual inspection, each top deck [door]: a. Is in place and closed; and b. Has no condensation, frost, or ice formed on the [door] that would restrict its opening.	[92 days OR In accordance with the Surveillance Frequency Control Program]	1 3 8 9 3 8

CTS

Ice Condenser Doors (Ice Condenser)
3.6.16 13

1

3.6 CONTAINMENT SYSTEMS

3.6.16 13 Ice Condenser Doors (Ice Condenser)

1

3.6.5.3 LCO 3.6.16 13 The ice condenser inlet doors, intermediate deck doors, and top deck [doors] shall be OPERABLE and closed.

3

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

ACTIONS

S

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

DOC L01 1. Separate Condition entry is allowed for each ice condenser door. INSERT 1

4

CONDITION	REQUIRED ACTION	COMPLETION TIME
3.6.5.3.a A. One or more ice condenser inlet doors inoperable due to being physically restrained from opening.	A.1 Restore inlet door to OPERABLE status.	1 hour
3.6.5.3.b B. One or more ice condenser doors inoperable for reasons other than Condition A or not closed.	B.1 Verify maximum ice bed temperature is ≤ [27]°F. AND B.2 Restore ice condenser door to OPERABLE status and closed positions.	Once per 4 hours 3 14 days 5
3.6.5.3.b C. Required Action B.1 and associated Completion Time of Condition B not met.	C.1 Restore ice condenser door to OPERABLE status and closed positions. INSERT 2	48 hours Immediately 6
3.6.5.3.b D. Required Action and associated Completion Time of Condition A or C not met. INSERT 3	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours 6

Stet

CSS-027

CTS

4 **INSERT 1**

DOC L02 2. When an ice condenser intermediate deck or top deck door is inoperable for a short duration solely due to personnel standing on or opening the door to perform required Surveillances, minor preventative maintenance, or system walkdowns, entry into ~~associated~~ Conditions ~~and Required Actions~~ is not required. CSS-028

B

6 ~~**INSERT 2**~~

~~DOC M01~~

~~Enter the applicable Conditions and Required Actions of LCO 3.6.12, "Ice Bed," for ice bed temperature > 27°F.~~ CSS-027

6 ~~**INSERT 3**~~

~~OR~~

~~Required Action B.2 and associated Completion Time not met.~~

Insert Page 3.6.13-1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.3.1.a	SR 3.6.16.1 13	Verify all inlet doors indicate are closed by the Inlet Door Position Monitoring System. Stet	[12 hours CSS-029 OR In accordance with the Surveillance Frequency Control Program]	7 8 1 8
4.6.5.3.2.a	SR 3.6.16.2 13	Verify, by visual inspection, each intermediate deck door is closed and not impaired by ice, frost, or debris.	[7 days OR In accordance with the Surveillance Frequency Control Program]	1 8 8
4.6.5.3.1.b.2	SR 3.6.16.3 13	Verify, by visual inspection, each inlet door is not impaired by ice, frost, or debris.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 8 8

CTS

Ice Condenser Doors (Ice Condenser)
3.6.16 13 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.5.3.1.b.1	SR 3.6.16.4 (13)	Verify torque required to cause each inlet door to begin to open is ≤ [675] in-lb.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 3 8 8
4.6.5.3.1.b.3	SR 3.6.16.5 (13)	Perform a torque test on [a sampling of ≥ 25% of the] inlet doors. (each)	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 3 8 8

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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.6.5.3.2.b	SR 3.6.16.6 13	Verify for each intermediate deck door: a. No visual evidence of structural deterioration, ; b. Free movement of the vent assemblies, ; and c. Free movement of the door.	[3 months during first year after receipt of license] AND [[18] months OR In accordance with the Surveillance Frequency Control Program]	1 5 8 8
4.6.5.3.3.a 4.6.5.3.3.b	SR 3.6.16.7 13	Verify, by visual inspection, each top deck [door]: a. Is in place and closed; and b. Has no condensation, frost, or ice formed on the [door] that would restrict its opening.	[92 days OR In accordance with the Surveillance Frequency Control Program]	1 3 8 9 3 8

JUSTIFICATION FOR DEVIATIONS

ITS 3.6.13, ICE CONDENSER DOORS

1. The heading and title for ISTS 3.6.16 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, many Containment Specifications in NUREG-1431, Rev. 4 are not included in the SQN ITS due to design differences. Therefore, ISTS 3.6.16 is renumbered as ITS 3.6.13.

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. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

4. The ISTS Bases for ACTIONS B.1 and B.2 (last sentence) state that entry into Condition B is not required due to personnel standing on or opening an intermediate deck or top deck door for short durations to perform required Surveillance, minor maintenance such as ice removal, or routine tasks such as system walkdowns. As documented in Part 9900 of the NRC Inspection Manual, Technical Guidance - Licensee Technical Specifications Interpretations, and in the ITS Bases Control Program (ITS 5.5.12), neither the Technical Specifications Bases nor Licensee generated interpretations can be used to change the Technical Specification requirements. Thus, since the ISTS do not provide for this option, the Bases cannot change the Technical Specifications requirement. To preclude this problem, a Note has been added to the ITS (ACTIONS Note 2) to allow an intermediate deck or top deck door to be inoperable (i.e., open or incapable of opening) for short durations during the ISTS Bases specified evolutions. During this time, the ice bed temperature should be continuously monitored to ensure the open door does not result in ice bed temperature greater than the limit. This new Note maintains the intent of the ISTS Bases allowance.

5. Typographical/grammatical error corrected.

Not Used

CSS-027

6. ~~ISTS LCO 3.6.16 Condition B is entered when one or more ice condenser doors are inoperable for reasons other than Condition A (i.e., door not physically restrained from opening) or is not closed. Continued unit operation is allowed for up to 14 days, provided ice bed temperature is monitored once per 4 hours. ISTS LCO 3.6.16 ACTION C.1 requires the inoperable ice condenser door to be restored to an OPERABLE status and closed position within 48 hours, when the Required Action and associated Completion Time of Condition B is not met. However, this effectively extends the time that an ice condenser door is allowed to be inoperable or open. Therefore, Condition C has been modified to require entry into the applicable Condition and Required Actions of LCO 3.6.12, "Ice Bed," when ice bed temperature exceeds 27°F (i.e., Require Action B.1 and associated Completion Time not met). Additionally, Condition D has been modified to require initiation of a unit shutdown when the inoperable ice condenser door cannot be restored to an OPERABLE status and closed within 14 days (i.e., Require Action B.2 and associated Completion Time not met).~~

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.13, ICE CONDENSER DOORS

Not Used CSS-029

7. ~~The requirement in ISTS SR 3.6.16.1 (ITS SR 3.6.13.1) to use the Inlet Door Position Monitoring System has been deleted. The Bases for this Surveillance has been revised to state that the verification of the inlet doors is normally performed using the Inlet Door Position Monitoring System. This change is made since it may be possible to verify the correct position of the doors, and thus meet the Surveillance Requirement, with an inoperable Inlet Door Position Monitoring System. This is consistent with the analysis documented in WCAP-11618, "Methodically Engineered Restructured and Improved Technical Specifications, MERITS Program - Phase II Task 5, Criteria Application," including Addendum 1, and the NRC Staff Review of NSSS Vendor Owners Groups Application of The Commission's Interim Policy Statement Criteria To Standard Technical Specifications, Wilgus/Murley letter dated May 9, 1988. In addition, this change is consistent with other Surveillance Requirements that require verification of certain parameters, and do not include the specific instrumentation used to perform the verification within the Surveillance Requirement.~~

8. ISTS SR 3.6.16.1, SR 3.6.16.2, SR 3.6.16.3, SR 3.6.16.4, SR 3.6.16.5, SR 3.6.16.6, and SR 3.6.16.7 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.13.1, SR 3.6.13.2, SR 3.6.13.3, SR 3.6.13.4, SR 3.6.13.5, SR 3.6.13.6, and SR 3.6.13.7 under the Surveillance Frequency Control Program.

9. ISTS LCO 3.6.16 requires the ice condenser inlet doors, intermediate deck doors, and top deck doors to be OPERABLE and closed. ISTS SR 3.6.16.7 requires each top deck door to be visually verified to be in place and have no condensation, frost, or ice formed on the door that would restrict its opening. However, there is no requirement to verify that each top deck door is closed. Therefore, ITS SR 3.6.13.7 has been modified to include verification that each top deck door is closed.

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~16~~ 13 Ice Condenser Doors ~~(Ice Condenser)~~ 1

BASES

BACKGROUND

The ice condenser doors consist of the inlet doors, the intermediate deck doors, and the top deck doors. The functions of the doors are to:

a. Seal the ice condenser from air leakage during the lifetime of the unit ; and 3

b. Open in the event of a Design Basis Accident (DBA) to direct the hot steam air mixture from the DBA into the ice bed, where the ice would absorb energy and limit containment peak pressure and temperature during the accident transient.

Limiting the pressure and temperature following a DBA reduces the release of fission product radioactivity from containment to the environment.

The ice condenser is an annular compartment enclosing approximately 300~~°~~ degrees of the perimeter of the upper containment compartment, but penetrating the operating deck so that a portion extends into the lower containment compartment. The inlet doors separate the atmosphere of the lower compartment from the ice bed inside the ice condenser. The top deck doors are above the ice bed and exposed to the atmosphere of the upper compartment. The intermediate deck doors, located below the top deck doors, form the floor of a plenum at the upper part of the ice condenser. This plenum area is used to facilitate surveillance and maintenance of the ice bed. 11

The ice baskets held in the ice bed within the ice condenser are arranged to promote heat transfer from steam to ice. This arrangement enhances the ice condenser's primary function of condensing steam and absorbing heat energy released to the containment during a DBA.

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the top deck doors to open, which allows the air to flow out of the ice condenser into the upper compartment. Steam condensation within the ice condensers limits the pressure and temperature buildup in containment. A divider barrier separates the upper and lower compartments and ensures that the steam is directed into the ice condenser.

BASES

BACKGROUND (continued)

The ice, together with the containment spray, serves as a containment heat removal system and is adequate to absorb the initial blowdown of steam and water from a DBA as well as the additional heat loads that would enter containment during the several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves to equalize pressures in containment and to continue circulating heated air and steam from the lower compartment through the ice condenser, where the heat is removed by the remaining ice. 2

The water from the melted ice drains into the lower compartment where it serves as a source of borated water (via the containment sump) for the Emergency Core Cooling System (ECCS) and the Containment Spray System heat removal functions in the recirculation mode. The ice (via the Containment Spray System) and the recirculated ice melt also serve to clean up the containment atmosphere.

The ice condenser doors ensure that the ice stored in the ice bed is preserved during normal operation (doors closed) and that the ice condenser functions as designed if called upon to act as a passive heat sink following a DBA.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment pressure and temperature 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.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed with respect to Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train each of the Containment Spray System and the one ARS fan being rendered inoperable. 4

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. For certain aspects of transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the cooling effectiveness of

BASES

APPLICABLE SAFETY ANALYSES (continued)

the ECCS 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. 2).

The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5~~B~~, "Containment Air Temperature." 1

An additional design requirement was imposed on the ice condenser door design for a small break accident in which the flow of heated air and steam is not sufficient to fully open the doors.

For this situation, the doors are designed so that all of the doors would partially open by approximately the same amount. Thus, the partially opened doors would modulate the flow so that each ice bay would receive an approximately equal fraction of the total flow.

This design feature ensures that the heated air and steam will not flow preferentially to some ice bays and deplete the ice there without utilizing the ice in the other bays.

In addition to calculating the overall peak containment pressures, the DBA analyses include the calculation of the transient differential pressures that would occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand the local transient pressure differentials for the limiting DBAs.

The ice condenser doors satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum equipment requirements to assure that the ice condenser doors perform their safety function. The ice condenser inlet doors, intermediate deck doors, and top deck doors must be closed to minimize air leakage into and out of the ice condenser, with its attendant leakage of heat into the ice condenser and loss of ice through melting and sublimation. The doors must be OPERABLE to ensure the proper opening of the ice condenser in the event of a DBA. OPERABILITY includes being free of any obstructions that would limit their opening, and for the inlet doors, being adjusted such that the opening and closing torques are within limits. The ice condenser doors function with the ice condenser to limit the pressure and temperature that could be expected following a DBA.

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 ice condenser doors. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ice condenser doors are not required to be OPERABLE in these MODES.

ACTIONS

1 A Note provides clarification that, for this LCO, separate Condition entry is allowed for each ice condenser door. 5

INSERT 1

A.1

If one or more ice condenser inlet doors are inoperable due to being physically restrained from opening, the door(s) must be restored to OPERABLE status 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 containment to be restored to OPERABLE status within 1 hour.

STET CSS-032

B.1 and B.2

If one or more ice condenser doors are determined to be partially open or otherwise inoperable for reasons other than Condition A or if a door is found that is not closed, it is acceptable to continue unit operation for up to 14 days, provided the ice bed temperature instrumentation is monitored once per 4 hours to ensure that the open or inoperable door is not allowing enough air leakage to cause the maximum ice bed temperature to approach the melting point. The Frequency of 4 hours is based on the fact that temperature changes cannot occur rapidly in the ice bed because of the large mass of ice involved. The 14 day Completion Time is based on long term ice storage tests that indicate that if the temperature is maintained below [27]°F, there would not be a significant loss of ice from sublimation. If the maximum ice bed temperature is > [27]°F at any time, the situation reverts to Condition C and a Completion Time of 48 hours is allowed to restore the inoperable door to OPERABLE status or enter into Required Actions D.1 and D.2. Ice bed temperature must be verified to be within the specified Frequency as augmented by the provisions of SR 3.0.2. If this verification is not made, Required Actions D.1 and D.2, not Required Action C.1, must be taken. Entry into Condition B is not required due to personnel standing on or opening an intermediate deck or upper deck door for short durations to perform required surveillances, minor maintenance such as ice removal, or routine tasks such as system walkdowns.

Completion Time
once per
at or
Stet
6
6 7
8
CSS-027
5

5 **INSERT 1**

Note 2 has been added to allow an intermediate deck or top deck door to be inoperable for a short duration solely due to personnel standing on or opening the door to perform required Surveillances, minor preventative maintenance, or system walkdowns, and does not require entry into ~~associated~~ Conditions ~~and Required Actions.~~ This is acceptable since the ice bed temperature is normally continuously monitored using an alarm in the control room, which alarms on an increasing ice bed temperature.

B

CSS-028

BASES

ACTIONS (continued)

C.1

Stet

INSERT 2 If Required Actions B.1 or B.2 are not met, the doors must be restored to OPERABLE status and closed positions within 48 hours. The 48 hour Completion Time is based on the fact that, with the very large mass of ice involved, it would not be possible for the temperature to decrease to the melting point and a significant amount of ice to melt in a 48 hour period. Condition C is entered from Condition B only when the Completion Time of Required Action B.2 is not met or when the ice bed temperature has not been verified at the required frequency.

CSS-027 5

D.1 and D.2

and closed positions 5

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

SURVEILLANCE REQUIREMENTS

SR 3.6.16.1 13 1

Stet CSS-029

Verifying, by means of the Inlet Door Position Monitoring System, that the inlet doors are in their closed positions makes the operator aware of an inadvertent opening of one or more doors. INSERT 3 [The Frequency of 12 hours ensures that operators on each shift are aware of the status of the doors.

5 9

OR

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

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

10

5

INSERT 2

CSS-027

If the maximum ice bed temperature is > 27°F at any time, the applicable Condition and Required Actions of LCO 3.6.12, "Ice Bed," are required to be entered immediately. The actions of this LCO provide the adequate compensatory actions to assure unit safety.

5

INSERT 3

The verification is normally performed using the Door Position Monitoring System. CSS-029

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.16.2

13

Verifying, by visual inspection, that each intermediate deck door is closed and not impaired by ice, frost, or debris provides assurance that the intermediate deck doors (which form the floor of the upper plenum where frequent maintenance on the ice bed is performed) have not been left open or obstructed. [The Frequency of 7 days is based on engineering judgment and takes into consideration such factors as the frequency of entry into the intermediate ice condenser deck, the time required for significant frost buildup, and the probability that a DBA will occur.

OR

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

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

SR 3.6.16.3

13

Verifying, by visual inspection, that the ice condenser inlet doors are not impaired by ice, frost, or debris provides assurance that the doors are free to open in the event of a DBA. [For this unit, the Frequency of [18] months [3 months during the first year after receipt of license] is based on door design, which does not allow water condensation to freeze, and operating experience, which indicates that the inlet doors very rarely fail to meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown.

OR

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

1 9 10 1 9

 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 10

SR 3.6.16.4 13 1

Verifying the opening torque of the inlet doors provides assurance that no doors have become stuck in the closed position. The value of [675] in-lb is based on the design opening pressure on the doors of 1.0 lb/ft^2. [For this unit, the Frequency of [18] months [3 months during the first year after receipt of license] is based on the passive nature of the closing mechanism (i.e., once adjusted, there are no known factors that would change the setting, except possibly a buildup of ice; ice buildup is not likely, however, because of the door design, which does not allow water condensation to freeze). Operating experience indicates that the inlet doors usually meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown. 7 9

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 10

SR 3.6.16.5 13 1

The torque test Surveillance ensures that the inlet doors have not developed excessive friction and that the return springs are producing a door return torque within limits. The torque test consists of the following:

1. Verify that the torque, T(OPEN), required to cause opening motion at the [40]° open position is ≤ [195] in-lb, < 6 7

 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

2. Verify that the torque, T(CLOSE), required to hold the door stationary (i.e., keep it from closing) at the ~~[~~40~~]~~° open position is ~~≥~~ > ~~[~~78~~]~~ in-lb, and 6 7

3. Calculate the frictional torque, T(FRICT) = 0.5 {T(OPEN) - T(CLOSE)}, and verify that the T(FRICT) is ≤ ~~[~~40~~]~~ in-lb.

The purpose of the friction and return torque Specifications is to ensure that, in the event of a small break LOCA or SLB, all of the 24 door pairs open uniformly. This assures that, during the initial blowdown phase, the steam and water mixture entering the lower compartment does not pass through part of the ice condenser, depleting the ice there, while bypassing the ice in other bays. ~~[The Frequency of [18] months [3 months during the first year after receipt of license] is based on the passive nature of the closing mechanism (i.e., once adjusted, there are no known factors that would change the setting, except possibly a buildup of ice; ice buildup is not likely, however, because of the door design, which does not allow water condensation to freeze). Operating experience indicates that the inlet doors very rarely fail to meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown.~~ 9

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ 10

SR 3.6.~~16~~.6 13 1

Verifying the OPERABILITY of the intermediate deck doors provides assurance that the intermediate deck doors are free to open in the event of a DBA. The verification consists of visually inspecting the intermediate doors for structural deterioration, verifying free movement of the vent assemblies, and ascertaining free movement of each door when lifted with the applicable force shown below:

BASES

SURVEILLANCE REQUIREMENTS (continued)

	Door		Lifting Force
a.	~~Adjacent to crane wall~~ [0-1, 0-5]		[≤] ~~<~~ 37.4 lb
b.	~~Paired with door adjacent to crane wall~~ [0-2, 0-6]		≤ 33.8 lb
c.	~~Adjacent to containment wall~~ [0-3, 0-7]		≤ [31.0] ~~31.8~~ lb
d.	~~Paired with door adjacent to containment wall~~ [0-4, 0-8]		≤ [31.8] ~~31.0~~ lb

(2)

~~[The 18 month Frequency [3 months during the first year after receipt of license] is based on the passive design of the intermediate deck doors, the frequency of personnel entry into the intermediate deck, and the fact that SR 3.6.16.2 confirms on a 7 day Frequency that the doors are not impaired by ice, frost, or debris, which are ways a door would fail the opening force test (i.e., by sticking or from increased door weight).~~

~~OR~~ (9)

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

~~-----------------------------REVIEWER'S NOTE-----------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ (10)

SR 3.6.~~16~~.7 [13] (1)

Verifying, by visual inspection, that the top deck doors are in place [, closed,] and not obstructed provides assurance that the doors are performing their function of keeping warm air out of the ice condenser during normal operation, and would not be obstructed if called upon to open in response to a DBA. ~~[The Frequency of 92 days is based on engineering judgment, which considered such factors as the following:~~ (5)

~~a. The relative inaccessibility and lack of traffic in the vicinity of the doors make it unlikely that a door would be inadvertently left open,~~

~~b. Excessive air leakage would be detected by temperature monitoring in the ice condenser, and~~ (9)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~c. The light construction of the doors would ensure that, in the event of a DBA, air and gases passing through the ice condenser would find a flow path, even if a door were obstructed.~~ (9)

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~ (10)

REFERENCES

1. U FSAR, Chapter ~~[15]~~ 6. (2) (7)
2. 10 CFR 50, Appendix K.

1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~16~~ Ice Condenser Doors ~~(Ice Condenser)~~

13

1

BASES

BACKGROUND

The ice condenser doors consist of the inlet doors, the intermediate deck doors, and the top deck doors. The functions of the doors are to:

a. Seal the ice condenser from air leakage during the lifetime of the unit ; and 3

b. Open in the event of a Design Basis Accident (DBA) to direct the hot steam air mixture from the DBA into the ice bed, where the ice would absorb energy and limit containment peak pressure and temperature during the accident transient.

Limiting the pressure and temperature following a DBA reduces the release of fission product radioactivity from containment to the environment.

The ice condenser is an annular compartment enclosing approximately 300~~°~~ degrees of the perimeter of the upper containment compartment, but penetrating the operating deck so that a portion extends into the lower containment compartment. The inlet doors separate the atmosphere of the lower compartment from the ice bed inside the ice condenser. The top deck doors are above the ice bed and exposed to the atmosphere of the upper compartment. The intermediate deck doors, located below the top deck doors, form the floor of a plenum at the upper part of the ice condenser. This plenum area is used to facilitate surveillance and maintenance of the ice bed. 11

The ice baskets held in the ice bed within the ice condenser are arranged to promote heat transfer from steam to ice. This arrangement enhances the ice condenser's primary function of condensing steam and absorbing heat energy released to the containment during a DBA.

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the top deck doors to open, which allows the air to flow out of the ice condenser into the upper compartment. Steam condensation within the ice condensers limits the pressure and temperature buildup in containment. A divider barrier separates the upper and lower compartments and ensures that the steam is directed into the ice condenser.

BASES

BACKGROUND (continued)

The ice, together with the containment spray, serves as a containment heat removal system and is adequate to absorb the initial blowdown of steam and water from a DBA as well as the additional heat loads that would enter containment during the several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves to equalize pressures in containment and to continue circulating heated air and steam from the lower compartment through the ice condenser, where the heat is removed by the remaining ice. 2

The water from the melted ice drains into the lower compartment where it serves as a source of borated water (via the containment sump) for the Emergency Core Cooling System (ECCS) and the Containment Spray System heat removal functions in the recirculation mode. The ice (via the Containment Spray System) and the recirculated ice melt also serve to clean up the containment atmosphere.

The ice condenser doors ensure that the ice stored in the ice bed is preserved during normal operation (doors closed) and that the ice condenser functions as designed if called upon to act as a passive heat sink following a DBA.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment pressure and temperature 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.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed with respect to Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in one train each of the Containment Spray System and the ARS being rendered inoperable. 4
one fan

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. For certain aspects of transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the cooling effectiveness of

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BASES

APPLICABLE SAFETY ANALYSES (continued)

the ECCS 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. 2).

The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5~~B~~, "Containment Air Temperature." 1

An additional design requirement was imposed on the ice condenser door design for a small break accident in which the flow of heated air and steam is not sufficient to fully open the doors.

For this situation, the doors are designed so that all of the doors would partially open by approximately the same amount. Thus, the partially opened doors would modulate the flow so that each ice bay would receive an approximately equal fraction of the total flow.

This design feature ensures that the heated air and steam will not flow preferentially to some ice bays and deplete the ice there without utilizing the ice in the other bays.

In addition to calculating the overall peak containment pressures, the DBA analyses include the calculation of the transient differential pressures that would occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand the local transient pressure differentials for the limiting DBAs.

The ice condenser doors satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum equipment requirements to assure that the ice condenser doors perform their safety function. The ice condenser inlet doors, intermediate deck doors, and top deck doors must be closed to minimize air leakage into and out of the ice condenser, with its attendant leakage of heat into the ice condenser and loss of ice through melting and sublimation. The doors must be OPERABLE to ensure the proper opening of the ice condenser in the event of a DBA. OPERABILITY includes being free of any obstructions that would limit their opening, and for the inlet doors, being adjusted such that the opening and closing torques are within limits. The ice condenser doors function with the ice condenser to limit the pressure and temperature that could be expected following a DBA.

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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 ice condenser doors. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are reduced due to the pressure and temperature limitations of these MODES. Therefore, the ice condenser doors are not required to be OPERABLE in these MODES.

ACTIONS

1 A Note provides clarification that, for this LCO, separate Condition entry is allowed for each ice condenser door. 5

INSERT 1

A.1

If one or more ice condenser inlet doors are inoperable due to being physically restrained from opening, the door(s) must be restored to OPERABLE status 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 containment to be restored to OPERABLE status within 1 hour.

STET

B.1 and B.2

CSS-032

If one or more ice condenser doors are determined to be partially open or otherwise inoperable for reasons other than Condition A or if a door is found that is not closed, it is acceptable to continue unit operation for up to 14 days, provided the ice bed temperature instrumentation is monitored once per 4 hours to ensure that the open or inoperable door is not allowing enough air leakage to cause the maximum ice bed temperature to approach the melting point. The Frequency of 4 hours is based on the fact that temperature changes cannot occur rapidly in the ice bed because of the large mass of ice involved. The 14 day Completion Time is based on long term ice storage tests that indicate that if the temperature is maintained below [27]°F, there would not be a significant loss of ice from sublimation. If the maximum ice bed temperature is > [27]°F at any time, the situation reverts to Condition C and a Completion Time of 48 hours is allowed to restore the inoperable door to OPERABLE status or enter into Required Actions D.1 and D.2. Ice bed temperature must be verified to be within the specified Frequency as augmented by the provisions of SR 3.0.2. If this verification is not made, Required Actions D.1 and D.2, not Required Action C.1, must be taken. Entry into Condition B is not required due to personnel standing on or opening an intermediate deck or upper deck door for short durations to perform required surveillances, minor maintenance such as ice removal, or routine tasks such as system walkdowns.

Completion Time

once per

at or

Stet

6 7 8 5 CSS-027

5 **INSERT 1**

Note 2 has been added to allow an intermediate deck or top deck door to be inoperable for a short duration solely due to personnel standing on or opening the door to perform required Surveillances, minor preventative maintenance, or system walkdowns, and does not require entry into ~~associated~~ Conditions ~~and Required Actions~~. This is acceptable since the ice bed temperature is normally continuously monitored using an alarm in the control room, which alarms on an increasing ice bed temperature.

B

CSS-028

BASES

ACTIONS (continued)

C.1

Stet

CSS-027

INSERT 2

If Required Actions B.1 or B.2 are not met, the doors must be restored to OPERABLE status and closed positions within 48 hours. The 48 hour Completion Time is based on the fact that, with the very large mass of ice involved, it would not be possible for the temperature to decrease to the melting point and a significant amount of ice to melt in a 48 hour period. Condition C is entered from Condition B only when the Completion Time of Required Action B.2 is not met or when the ice bed temperature has not been verified at the required frequency. 5

D.1 and D.2

and closed positions 5

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

SURVEILLANCE REQUIREMENTS

SR 3.6.16.1 1

13

Stet

CSS-029

Verifying, by means of the Inlet Door Position Monitoring System, that the inlet doors are in their closed positions makes the operator aware of an inadvertent opening of one or more doors. [The Frequency of 12 hours ensures that operators on each shift are aware of the status of the doors.

INSERT 3

5 9

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 10

5

INSERT 2

CSS-027

If the maximum ice bed temperature is > 27°F at any time, the applicable Condition and Required Actions of LCO 3.6.12, "Ice Bed," are required to be entered immediately. The actions of this LCO provide the adequate compensatory actions to assure unit safety.

5

INSERT 3

The verification is normally performed using the Door Position Monitoring System. CSS-029

 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.16.2 13 1

Verifying, by visual inspection, that each intermediate deck door is closed and not impaired by ice, frost, or debris provides assurance that the intermediate deck doors (which form the floor of the upper plenum where frequent maintenance on the ice bed is performed) have not been left open or obstructed. [The Frequency of 7 days is based on engineering judgment and takes into consideration such factors as the frequency of entry into the intermediate ice condenser deck, the time required for significant frost buildup, and the probability that a DBA will occur. 9

OR

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

---REVIEWER'S NOTE---
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 10

SR 3.6.16.3 13 1

Verifying, by visual inspection, that the ice condenser inlet doors are not impaired by ice, frost, or debris provides assurance that the doors are free to open in the event of a DBA. [For this unit, the Frequency of [18] months [3 months during the first year after receipt of license] is based on door design, which does not allow water condensation to freeze, and operating experience, which indicates that the inlet doors very rarely fail to meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown. 9

OR

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

-------------------------------REVIEWER'S NOTE-------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--]
10

SR 3.6.16.4
13
1

Verifying the opening torque of the inlet doors provides assurance that no doors have become stuck in the closed position. The value of [675] in-lb is based on the design opening pressure on the doors of 1.0 lb/ft^2. [For this unit, the Frequency of [18] months [3 months during the first year after receipt of license] is based on the passive nature of the closing mechanism (i.e., once adjusted, there are no known factors that would change the setting, except possibly a buildup of ice; ice buildup is not likely, however, because of the door design, which does not allow water condensation to freeze). Operating experience indicates that the inlet doors usually meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown.
7
9

OR

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

-------------------------------REVIEWER'S NOTE-------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--]
10

SR 3.6.16.5
13
1

The torque test Surveillance ensures that the inlet doors have not developed excessive friction and that the return springs are producing a door return torque within limits. The torque test consists of the following:

1. Verify that the torque, T(OPEN), required to cause opening motion at the [40]° open position is ≤ [195] in-lb,
<
6 7

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

2. Verify that the torque, T(CLOSE), required to hold the door stationary (i.e., keep it closing) at the [40]° open position is ≥ > [78] in-lb, and 6 7

3. Calculate the frictional torque, T(FRICT) = 0.5 {T(OPEN) - T(CLOSE)}, and verify that the T(FRICT) is ≤ [40] in-lb.

The purpose of the friction and return torque Specifications is to ensure that, in the event of a small break LOCA or SLB, all of the 24 door pairs open uniformly. This assures that, during the initial blowdown phase, the steam and water mixture entering the lower compartment does not pass through part of the ice condenser, depleting the ice there, while bypassing the ice in other bays. [The Frequency of [18] months [3 months during the first year after receipt of license] is based on the passive nature of the closing mechanism (i.e., once adjusted, there are no known factors that would change the setting, except possibly a buildup of ice; ice buildup is not likely, however, because of the door design, which does not allow water condensation to freeze). Operating experience indicates that the inlet doors very rarely fail to meet their SR acceptance criteria. Because of high radiation in the vicinity of the inlet doors during power operation, this Surveillance is normally performed during a shutdown. 9

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 10

SR 3.6.1613.6 1

Verifying the OPERABILITY of the intermediate deck doors provides assurance that the intermediate deck doors are free to open in the event of a DBA. The verification consists of visually inspecting the intermediate doors for structural deterioration, verifying free movement of the vent assemblies, and ascertaining free movement of each door when lifted with the applicable force shown below:

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

	Door	Lifting Force
a.	Adjacent to crane wall (0-1, 0-5)	≤ (<) 37.4 lb
b.	Paired with door adjacent to crane wall (0-2, 0-6)	≤ 33.8 lb
c.	Adjacent to containment wall (0-3, 0-7)	≤ 31.0 (31.8) lb
d.	Paired with door adjacent to containment wall (0-4, 0-8)	≤ 31.8 (31.0) lb

2

[The 18 month Frequency [3 months during the first year after receipt of license] is based on the passive design of the intermediate deck doors, the frequency of personnel entry into the intermediate deck, and the fact that SR 3.6.16.2 confirms on a 7 day Frequency that the doors are not impaired by ice, frost, or debris, which are ways a door would fail the opening force test (i.e., by sticking or from increased door weight).

OR

9

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

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

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SR 3.6.16.7

13

1

, closed,

5

Verifying, by visual inspection, that the top deck doors are in place, closed, and not obstructed provides assurance that the doors are performing their function of keeping warm air out of the ice condenser during normal operation, and would not be obstructed if called upon to open in response to a DBA. [The Frequency of 92 days is based on engineering judgment, which considered such factors as the following:

a. The relative inaccessibility and lack of traffic in the vicinity of the doors make it unlikely that a door would be inadvertently left open,

b. Excessive air leakage would be detected by temperature monitoring in the ice condenser, and

9

BASES

SURVEILLANCE REQUIREMENTS (continued)

c. The light construction of the doors would ensure that, in the event of a DBA, air and gases passing through the ice condenser would find a flow path, even if a door were obstructed. 9

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
---] 10

REFERENCES

1. U FSAR, Chapter [15] 6. 2 7
2. 10 CFR 50, Appendix K.

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.13 BASES, ICE CONDENSER DOORS

1. The heading and title for ISTS 3.6.16 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.16 is renumbered as ITS 3.6.13.

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

3. Typographical/grammatical error corrected.

4. The SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans."

5. Changes have been made to be consistent with changes made to the ITS.

6. Changes have been made to be consistent with the ITS.

7. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

Not Used

8. ~~The Bases wording is deleted because the Bases places additional restrictions than those specified in the Specification. In accordance with the Specification, if ACTION B is not met for any reason (Required Actions B.1 or B.2 not met), then the default ACTION is ACTION C, while the ISTS Bases requires Required Actions D.1 and D.2 to be applied if the temperature verification is not made. The Required Actions in the Specification are consistent with the current allowances in the CTS, therefore the change is appropriate.~~ CSS-027

9. ISTS SR 3.6.16.1, SR 3.6.16.2, SR 3.6.16.3, SR 3.6.16.4, SR 3.6.16.5, SR 3.6.16.6, and SR 3.6.16.7 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.13.1, SR 3.6.13.2, SR 3.6.13.3, SR 3.6.13.4, SR 3.6.13.5, SR 3.6.13.6, and SR 3.6.13.7 under the Surveillance Frequency Control Program.

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

11. Changes are made to provide clarity concerning the extent of the perimeter of the upper containment that the ice condenser encloses.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.13, ICE CONDENSER DOORS

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 14

ITS 3.6.14, DIVIDER BARRIER INTEGRITY

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

ITS 3.6.14

A01

CONTAINMENT SYSTEMS

DIVIDER BARRIER ~~PERSONNEL ACCESS DOORS AND EQUIPMENT HATCHES~~ Integrity A02

LIMITING CONDITION FOR OPERATION

Divider barrier integrity shall be maintained. A02

LCO 3.6.14 3.6.5.5 ~~The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be OPERABLE and closed.~~ LA01

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

A03

ACTION: Add proposed Condition A Note

A04

one or more, and, LCO 3.6.14 Note

ACTION A With ~~a~~ personnel access door or equipment hatch inoperable or open except for personnel transit entry, restore the door or hatch to OPERABLE status ~~or to its~~ closed position (as applicable) within 1 hour or be

ACTION C in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

and exit A07

SURVEILLANCE REQUIREMENTS

SR 3.6.14.1, SR 3.6.14.3 4.6.5.5.1 The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be determined closed by a visual inspection prior to increasing the Reactor Coolant System T_{avg} above 200°F and after each personnel transit entry when the Reactor Coolant System T_{avg} is above 200°F.

SR 3.6.14.2 4.6.5.5.2 The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be determined OPERABLE by visually inspecting the seals and sealing surfaces of these penetrations and verifying no detrimental misalignments, cracks or defects in the sealing surfaces, or apparent deterioration of the seal material:

a. Prior to final closure of the penetration each time it has been opened, and

b. ~~At least once per 10 years~~ for penetrations containing seals fabricated from resilient materials.

In accordance with the Surveillance Frequency Control Program LA02

A01

CONTAINMENT SYSTEMS

DIVIDER BARRIER ~~SEAL~~ Integrity — A02

LIMITING CONDITION FOR OPERATION

LCO 3.6.14 — 3.6.5.9 The divider barrier ~~seal shall be OPERABLE~~ integrity shall be maintained. — A02, LA01

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

ACTION:

ACTION B, ACTION C — Add proposed ACTIONS B and C — ~~With the divider barrier seal inoperable, restore the seal to OPERABLE status prior to increasing the Reactor Coolant System temperature above 200°F.~~ — A05

SURVEILLANCE REQUIREMENTS

SR 3.6.14.4., SR 3.6.14.5.a, SR 3.6.14.5.b — 4.6.5.9 The divider barrier seal shall be determined OPERABLE ~~at least once per 18 months during shutdown~~ In accordance with the Surveillance Frequency Control Program by: — LA02, L01

SR 3.6.14.4 — a. Removing and pressure testing the divider barrier seal test coupons ~~in accordance with Table 3.6-3~~, — A06

SR 3.6.14.5.a, SR 3.6.14.5.b — b. Visually inspecting at least 95 percent of the seal's entire length and:

SR 3.6.14.5.a — 1. Verifying that the seal and seal mounting bolts are properly installed, and

SR 3.6.14.5.b — 2. Verifying that the seal material shows no visual evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearances.

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ITS 3.6.14

A01

~~TABLE 3.6-3~~

~~DIVIDER BARRIER SEAL~~
~~ACCEPTABLE PHYSICAL PROPERTIES~~

A06

	Material	Differential Pressure	Elongation	
SR 3.6.14.4	~~Presray Corp. EPDM Compound E603 (2 ply Dacron Coated EPDM)~~	15 psid after LOCA environment simulation*	NA	LA03

SR 3.6.14.4, SR 3.6.14.4 Note

____

The test sequence will be as follows: 2 coupons will be tested to 60 psid; with no failures, the results are acceptable. If a failure occurs at 60 psig, 4 coupons will be tested to 30 psid; with no failures, the results are acceptable. If a failure occurs at 30 psid, 5 coupons will be sent to the manufacture for LOCA environment simulation ~~(radiation, humidity, temperature)~~ and testing to 15 psid. ~~LA04~~

STET

CSS-034

ITS 3.6.14

A01

CONTAINMENT SYSTEMS

DIVIDER BARRIER ~~PERSONNEL ACCESS DOORS AND EQUIPMENT HATCHES~~ Integrity A02

LIMITING CONDITION FOR OPERATION

Divider barrier integrity shall be maintained. A02

LCO 3.6.14 3.6.5.5 ~~The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be OPERABLE and closed.~~ LA01

Applicability APPLICABILITY: MODES 1, 2, 3 and 4. A03

ACTION: Add proposed Condition A Note

one or more; and; LCO 3.6.14 Note A04

ACTION A With ~~a~~ personnel access door or equipment hatch inoperable or open except for personnel transit entry, restore the door or hatch to OPERABLE status ~~or to its~~ closed position (as applicable) within 1 hour or be
ACTION C in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. and exit A07

SURVEILLANCE REQUIREMENTS

SR 3.6.14.1
SR 3.6.14.3 4.6.5.5.1 The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be determined closed by a visual inspection prior to increasing the Reactor Coolant System T_{avg} above 200°F and after each personnel transit entry when the Reactor Coolant System T_{avg} is above 200°F.

SR 3.6.14.2 4.6.5.5.2 The personnel access doors and equipment hatches between the containment's upper and lower compartments shall be determined OPERABLE by visually inspecting the seals and sealing surfaces of these penetrations and verifying no detrimental misalignments, cracks or defects in the sealing surfaces, or apparent deterioration of the seal material:

a. Prior to final closure of the penetration each time it has been opened, and

b. ~~At least once per 10 years~~ In accordance with the Surveillance Frequency Control Program for penetrations containing seals fabricated from resilient materials. LA02

ITS 3.6.14

A01

CONTAINMENT SYSTEMS

DIVIDER BARRIER ~~SEAL~~ Integrity

A02

LIMITING CONDITION FOR OPERATION

LCO 3.6.14 3.6.5.9 The divider barrier ~~seal shall be OPERABLE~~ integrity shall be maintained.

A02

LA01

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

ACTION:

Add proposed ACTIONS B and C

ACTION B
ACTION C ~~With the divider barrier seal inoperable, restore the seal to OPERABLE status prior to increasing the Reactor Coolant System temperature above 200°F.~~

A05

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program

LA02

SR 3.6.14.4.
SR 3.6.14.5.a,
SR 3.6.14.5.b 4.6.5.9 The divider barrier seal shall be determined OPERABLE ~~at least once per 18 months during shutdown~~ by:

L01

SR 3.6.14.4 a. Removing and pressure testing the divider barrier seal test coupons ~~in accordance with Table 3.6-3~~,

A06

SR 3.6.14.5.a,
SR 3.6.14.5.b b. Visually inspecting at least 95 percent of the seal's entire length and:

SR 3.6.14.5.a 1. Verifying that the seal and seal mounting bolts are properly installed, and

SR 3.6.14.5.b 2. Verifying that the seal material shows no visual evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearances.

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ITS A01 3.6.14

TABLE 3.6-3

DIVIDER BARRIER SEAL
ACCEPTABLE PHYSICAL PROPERTIES

A06

	Material	Differential Pressure	Elongation	
SR 3.6.14.4	Prespray Corp. EPDM Compound E603 (2 ply dacron coated EPDM)	15 psid after LOCA environmental simulation*	N/A	LA03

SR 3.6.14.4, SR 3.6.14.4 Note

* The test sequence will be as follows: 2 coupons will be tested to 60 psid; with no failures, the results are acceptable. If a failure occurs at 60 psid, 4 coupons will be tested to 30 psid; with no failures, the results are acceptable. If a failure occurs at 30 psid, 5 coupons will be sent to the manufacturer for LOCA environment simulation (radiation, humidity, temperature) and testing to 15 psid. LA04

STET

CSS-034

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DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.6.5.5 requires the personnel access doors and equipment hatches between the containment's upper and lower compartments to be OPERABLE and closed. CTS 3.6.5.9 requires the divider barrier seal to be OPERABLE. ITS LCO 3.6.14 requires the divider barrier integrity to be maintained. This changes the CTS by combining the divider barrier requirements of CTS 3.6.5.5 and CTS 3.6.5.9 into one LCO statement within the Divider Barrier Integrity Specification.

The purpose of CTS 3.6.5.5 and CTS 3.6.5.9 is to provide requirements pertaining to containment divider barrier integrity. This change is acceptable because moving these requirements to one LCO, ITS 3.6.14, centralizes the requirements. In addition, the requirement in CTS 3.6.5.5 for the personnel access doors and equipment hatches between the containment's upper and lower compartments to be closed is covered by CTS 4.6.5.5.1 (ITS SR 3.6.14.1). Therefore, it is part of maintaining divider barrier integrity. This change is designated as administrative, because it does not result in technical changes to the CTS.

A03 CTS 3.6.5.5 provides actions to take when a containment divider barrier personnel access door or equipment hatch is open or inoperable, and requires the door or hatch to be restored to an OPERABLE status or to its closed position (as applicable) within one hour. ITS 3.6.14 ACTION A requires one or more open or inoperable personnel access doors or equipment hatches to be restored and closed within one hour. This modifies the CTS by providing a specific requirement for an inoperable personnel access door or equipment hatch to be closed, in addition to being restored, within one hour.

The purpose of the CTS 3.6.5.5 Actions are to minimize the time the unit is operating with open or inoperable containment divider barrier personnel access doors or equipment hatches. This change is acceptable because it clearly states the current requirement to restore compliance with the LCO. The intent of the CTS Actions are to restore divider barrier integrity, including restoring inoperable personnel access doors or equipment hatches to an OPERABLE status, and closing personnel access doors or equipment hatches that are open. The CTS words "as applicable" imply that, if a door or hatch is both inoperable and open, then the actions to take would include both restoring to OPERABLE status and closing the door or hatch. This change is designated as administrative, because it does not result in technical changes to the CTS.

DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

A04 CTS 3.6.5.5 Action provides the actions to take when a containment divider barrier personnel access door or equipment hatch is open or inoperable. ITS 3.6.14 ACTION A provides an action for one or more personnel access doors or equipment hatches open or inoperable. In addition, ITS 3.6.14 Condition A includes a Note that allows separate Condition entry for each personnel access door or equipment hatch. This modifies the CTS by providing a specific allowance to enter the Action for each inoperable personnel access door or equipment hatch.

The purpose of CTS 3.6.5.5 is to minimize the time the unit is operating with inoperable containment divider barrier personnel access doors or equipment hatches. This change is acceptable because it clearly states the current requirement. The CTS considers each personnel access door or equipment hatch to be separate and independent from the others. This change is designated as administrative, because it does not result in technical changes to the CTS.

A05 CTS 3.6.5.9 Action does not state what action to take if the divider barrier seal is inoperable while in MODE 1, 2, 3, or 4; it only includes a requirement that the divider barrier seal be restored to OPERABLE status prior to increasing Reactor Coolant System temperature above 200°F (i.e., MODE 4). Therefore, entry into CTS 3.0.3 is required if CTS 3.6.5.9 is not met while in MODE 1, 2, 3, or 4. CTS 3.0.3 allows 1 hour to prepare for a shutdown and requires the unit to be in MODE 3 within 7 hours and MODE 5 within 37 hours. ITS 3.6.14 ACTION B requires that if the divider barrier seal is inoperable, it must be restored to OPERABLE status within 1 hour. ITS 3.6.14 ACTION C requires that if the Required Action and associated Completion Time are not met (i.e., the divider barrier seal is not restored to OPERABLE status in 1 hour), the unit must be in MODE 3 within 6 hours and MODE 5 within 36 hours. This changes the CTS by stating the ACTIONS within the Specification rather than deferring to CTS 3.0.3. In addition, it deletes the Action to restore the LCO prior to entering MODE 4.

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 3.6.5.9 is silent on these actions, deferring to CTS 3.0.3 for the actions. This change is acceptable because the ACTIONS specified in ITS 3.6.14 adopt ISTS structure for placing the unit outside the MODE of Applicability without changing the time specified to enter MODE 3 and MODE 5. In addition, deletion of the current Action of CTS 3.6.5.9 is acceptable because CTS 3.0.4 (ITS LCO 3.0.4) already precludes entering the MODE of Applicability when the LCO is not met. Therefore, it is not necessary to include these requirements as specific actions in ITS 3.6.14. This change is designated as administrative, because it does not result in technical changes to the CTS.

A06 CTS 4.6.5.9.a requires the divider barrier seal test coupons to be removed and tested in accordance with Table 3.6-3. CTS Table 3.6-3 provides the divider barrier seal acceptable physical properties and testing sequence for the test coupons. ITS SR 3.6.14.4 requires the divider barrier seal test coupons to be removed and tested and provides the divider barrier seal acceptable physical properties and testing sequence for the test coupons. This changes the CTS by

DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

moving the divider barrier seal acceptable physical properties and test coupon test sequence from a table and placing the information within the Surveillance Requirement.

The purpose of CTS 4.6.5.9.a and Table 3.6-3 is to conduct a physical property test of the divider barrier seal test coupon to provide assurance that the seal material has not degraded in the containment environment. This change is acceptable because moving the acceptable physical properties and test sequence from a table to within the Surveillance Requirement, ITS SR 3.6.14.4, centralizes the requirements. This change is designated as administrative, because it does not result in technical changes to the CTS.

A07 CTS 3.6.5.5 Action provides actions to take when a containment divider barrier personnel access door or equipment hatch is open or inoperable, and provides an exception for personnel transit entry. ITS LCO 3.6.14 requires divider barrier integrity to be maintained, and is modified by a Note that allows personnel access doors or equipment hatches to be opened for personnel transit entry and exit. This modifies the CTS by specifying the allowance to open personnel access doors and equipment hatches for personnel transit entry also applies to personnel transit for exit through the divider barrier.

The purpose of CTS 3.6.5.5 is to minimize the time the unit is operating with inoperable containment divider barrier personnel access doors or equipment hatches. This change is acceptable because it clarifies the current requirement that allows personnel transit through a containment divider barrier personnel access door or equipment hatch to include exit transit through the divider barrier. 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

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.5.5 requires the personnel access doors and equipment hatches between the containment's upper and lower compartments shall be OPERABLE and closed. CTS 3.6.5.9 requires the divider barrier seal shall be OPERABLE. ITS LCO 3.6.14 requires divider barrier integrity to be maintained. This changes the CTS by moving the detail of what constitutes divider barrier integrity to the Bases.

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DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

The removal of these details, that 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 retains the requirements that the divider barrier integrity shall be maintained. Also, this changes is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specifications Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA02 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.5.5.2 requires, in part, that the personnel access doors and equipment hatches between the upper and lower containment compartments be determined OPERABLE by visually inspecting the seals and sealing surfaces at least once per 10 years for penetrations containing seals fabricated from resilient materials. ITS SR 3.6.14.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." CTS 4.6.5.9 requires verification that each divider barrier seal is OPERABLE every 18 months during shutdown. CTS 4.6.5.9.a requires removal of divider barrier seal test coupons and verifying that the physical properties of the test coupons are within acceptable limits. CTS 4.6.5.9.b requires a visual inspection of at least 95% of the seal's entire length, verification that the seal and seal mounting bolts are properly installed, and verification that the seal material shows no visual evidence of deterioration. ITS SR 3.6.14.4 and SR 3.6.14.5 require the same testing and specify the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program. (The change of the requirement to perform the Surveillances during shutdown is discussed in DOC L01).

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LA03 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.6-3 specifies the divider barrier seal acceptable

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DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

physical properties. The table includes the differential pressure property, the divider seal material type, and a note that clarifies the test sequence. The material must be Presray Corp. EPDM Compound E603 (2 ply Dacron Coated EPDM). ITS SR 3.6.14.4 only includes the differential pressure property requirements and test sequence information. This changes the CTS by moving the divider barrier seal material type to the UFSAR.

The removal of this detail, which is 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 test for differential pressure. Also, this change is acceptable because the removed information 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 information relating to system design is being removed from the Technical Specifications.

Not Used

~~LA04 *(Type 4 – Removal of LCO, SR, or other TS Requirements to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* CTS Table 3.6-3 specifies the acceptable physical properties for testing the divider barrier seal test coupons. The table includes a note that clarifies the test sequence and defines the loss of coolant accident (LOCA) environment simulation as "radiation, humidity, temperature". ITS SR 3.6.14.4 includes the divider barrier seal physical property test acceptance criteria and test sequence information. ITS SR 3.6.14.4 also specifies that the manufacturer's divider barrier seal coupon test will include LOCA environment simulation, but does not include the definition of the LOCA environment simulation. This changes the CTS by moving the definition of the LOCA environment simulation to the TS Bases.~~ CSS-034

~~The removal of these details, which are related to methods of surveillance test performance, 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 requirements for verifying OPERABILITY of the divider barrier seal. Also, this changes is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specifications Bases Control Program in Chapter 5. This program provides for the evaluation of changes to the Bases to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to methods of surveillance test performance is being removed from the Technical Specifications.~~

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 8 – Deletion of Surveillance Requirement Shutdown Performance Requirements)* CTS 4.6.5.9 requires verification that each divider barrier seal is OPERABLE every 18 months during shutdown. CTS 4.6.5.9.a requires the removal of divider barrier seal test coupons and verifying that the physical properties of the test coupons are within the acceptable range. CTS 4.6.5.9.b

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DISCUSSION OF CHANGES
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

requires a visual inspection of at least 95% of the seal's entire length, verification that the seal and seal mounting bolts are properly installed, and verification that the seal material shows no visual evidence of deterioration. ITS SR 3.6.14.4 and SR 3.6.14.5 require the same testing at a Frequency of "In accordance with the Surveillance Frequency Control Program," with no restriction as to when (i.e., during shutdown) the test can be performed. This changes the CTS by deleting the requirement to perform the Surveillances during shutdown. (The change to relocate the Surveillance Frequency to the Surveillance Frequency Control Program is discussed in DOC LA02.)

The purpose of CTS 4.6.5.9 is to ensure the divider barrier seals are OPERABLE. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The proposed Surveillance does not include the restriction on unit conditions. Portions of the divider barrier seal Surveillance Requirements could be performed in other than shutdown conditions, without jeopardizing safe plant operations. The control of the unit conditions appropriate to perform the test is an issue for procedures and scheduling, and has been determined by the NRC Staff to be unnecessary as a Technical Specification restriction. As indicated in Generic Letter 91-04, allowing this control is consistent with the vast majority of other Technical Specification Surveillances that do not dictate unit conditions for the Surveillance. This change is designated as less restrictive, because the Surveillance may be performed at plant conditions other than shutdown.

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

3.6 CONTAINMENT SYSTEMS

3.6.17 14 Divider Barrier Integrity (Ice Condenser) ① ③

3.6.5.5
3.6.5.9 LCO 3.6.17 14 Divider barrier integrity shall be maintained.

INSERT 1

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC A04 A. ------------NOTE------------ For this action, separate Condition entry is allowed for each personnel access door or equipment hatch. -------------------------------- ④ 3.6.5.5 Action One or more personnel access doors or equipment hatches open or inoperable, other than for personnel transit entry. ③	A.1 Restore personnel access doors and equipment hatches to OPERABLE status and closed positions.	1 hour
3.6.5.9 Action B. Divider barrier seal inoperable.	B.1 Restore seal to OPERABLE status.	1 hour
3.6.5.5 Action 3.6.5.9 Action C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

3 **INSERT 1**

3.6.5.5 Action

---NOTE---
The personnel access doors and equipment hatches may be opened for personnel transit entry and exit.

CTS

Divider Barrier Integrity (Ice Condenser) 1
3.6.17
14

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.5.1	SR 3.6.17.1 14	Verify, by visual inspection, all personnel access doors and equipment hatches between upper and lower containment compartments are closed.	Prior to entering MODE 4 from MODE 5	1
4.6.5.5.2	SR 3.6.17.2 14	Verify, by visual inspection, that the seals and sealing surfaces of each personnel access door and equipment hatch have: a. No detrimental misalignments. ; b. No cracks or defects in the sealing surfaces, ; and c. No apparent deterioration of the seal material.	Prior to final closure after each opening AND --------NOTE-------- Only required for seals made of resilient materials ------------------------ [10 years OR In accordance with the Surveillance Frequency Control Program]	1 5 6 6
4.6.5.5.1	SR 3.6.17.3 14	Verify, by visual inspection, each personnel access door or equipment hatch that has been opened for personnel transit entry is closed.	After each opening	1
4.6.5.9.a	SR 3.6.17.4 14	Remove two divider barrier seal test coupons and verify: a. Both test coupons' tensile strength is ≥ [120] psi and [b. Both test coupons' elongation is ≥ [100]%.] INSERT 2	[[18] months OR In accordance with the Surveillance Frequency Control Program]	1 6 7 6

7

6

INSERT 2

-------------------------------NOTE-----------------------------
SR 3.6.14.4.a shall be performed. If SR 3.6.14.4.a is not met, then perform SR 3.6.14.4.b. If SR 3.6.14.4.b is not met, then perform SR 3.6.14.4.c.

Remove and pressure test the divider barrier seal test coupons as follows:

a. Two test coupons tested to 60 psid;

b. Four test coupons tested to 30 psid; or

c. Five test coupons sent to the manufacturer for loss of coolant accident (LOCA) environment simulation and testing to 15 psid.

CSS-034

(radiation, humidity, temperature)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.6.17.5 (14)	Visually inspect ≥ [95]% of the divider barrier seal length, and verify: 4.6.5.9.b.1 a. Seal and seal mounting bolts are properly installed and (;) 4.6.5.9.b.2 b. Seal material shows no evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearance.	[[18] months 1 8 6 OR In accordance with the Surveillance Frequency Control Program] 5 6

CTS

Divider Barrier Integrity (Ice Condenser)
3.6.17 14 ①

3.6 CONTAINMENT SYSTEMS

3.6.17 14 Divider Barrier Integrity (Ice Condenser) ①

3.6.5.5
3.6.5.9 LCO 3.6.17 14 Divider barrier integrity shall be maintained. ① ③

INSERT 1

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC A04 / 3.6.5.5 Action: A. ------------NOTE------------ For this action, separate Condition entry is allowed for each personnel access door or equipment hatch. --------------------------------- One or more personnel access doors or equipment hatches open or inoperable, other than for personnel transit entry.	A.1 Restore personnel access doors and equipment hatches to OPERABLE status and closed positions.	1 hour ④ ③
3.6.5.9 Action: B. Divider barrier seal inoperable.	B.1 Restore seal to OPERABLE status.	1 hour
3.6.5.5 Action / 3.6.5.9 Action: C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

3 **INSERT 1**

3.6.5.5 Action

---NOTE---
The personnel access doors and equipment hatches may be opened for personnel transit entry and exit.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.6.5.5.1	SR 3.6.17.1 14	Verify, by visual inspection, all personnel access doors and equipment hatches between upper and lower containment compartments are closed.	Prior to entering MODE 4 from MODE 5	1
4.6.5.5.2	SR 3.6.17.2 14	Verify, by visual inspection, that the seals and sealing surfaces of each personnel access door and equipment hatch have: a. No detrimental misalignments. ; b. No cracks or defects in the sealing surfaces, ; and c. No apparent deterioration of the seal material.	Prior to final closure after each opening AND --------NOTE-------- Only required for seals made of resilient materials ------------------------ [10 years OR In accordance with the Surveillance Frequency Control Program]	1 5 6 6
4.6.5.5.1	SR 3.6.17.3 14	Verify, by visual inspection, each personnel access door or equipment hatch that has been opened for personnel transit entry is closed.	After each opening	1
4.6.5.9.a	SR 3.6.17.4 14	Remove two divider barrier seal test coupons and verify: a. Both test coupons' tensile strength is ≥ [120] psi and [b. Both test coupons' elongation is ≥ [100]%.] INSERT 2	[[18] months OR In accordance with the Surveillance Frequency Control Program]	1 6 7 6

7

6

INSERT 2

------------------------------NOTE------------------------------
SR 3.6.14.4.a shall be performed. If SR 3.6.14.4.a is not met, then perform SR 3.6.14.4.b. If SR 3.6.14.4.b is not met, then perform SR 3.6.14.4.c.

Remove and pressure test the divider barrier seal test coupons as follows:

a. Two test coupons tested to 60 psid;

b. Four test coupons tested to 30 psid; or

c. Five test coupons sent to the manufacturer for loss of coolant accident (LOCA) environment simulation and testing to 15 psid. CSS-034

(radiation, humidity, temperature)

CTS

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.17.5 14	Visually inspect ≥ [95]% of the divider barrier seal length, and verify: 4.6.5.9.b.1 a. Seal and seal mounting bolts are properly installed and ; 4.6.5.9.b.2 b. Seal material shows no evidence of deterioration due to holes, ruptures, chemical attack, abrasion, radiation damage, or changes in physical appearance.	[[18] months OR In accordance with the Surveillance Frequency Control Program]

1 8 6 5 6

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JUSTIFICATION FOR DEVIATIONS
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

1. The heading and title for ISTS 3.6.17 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7), Hydrogen Mixing System (ISTS 3.6.9), or the Iodine Cleanup System (ISTS 3.6.11). Therefore, ISTS 3.6.7, ISTS 3.6.9, and ISTS 3.6.11 are not included in the SQN ITS and ISTS 3.6.17 is renumbered as ITS 3.6.14.

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. ISTS 3.6.17 Condition A covers one or more personnel access doors or equipment hatches open or inoperable, other than for personnel transit entry. There is no ACTION in ISTS 3.6.17 for when a door or hatch is open for personnel transit entry; therefore, LCO 3.0.3 is required to be entered if this occurs. This is not the intent of the Specification. Therefore, a Note has been added to the LCO to identify that the personnel access doors and equipment hatches may be opened for personnel transit entry and exit. In addition, the phrase "other than for personnel transit entry" has been deleted from Condition A, since it is not needed with the addition of the Note.

4. Changes have been made to be consistent with other similar Notes in the Specifications.

5. Typographical/grammatical error corrected.

6. ISTS SR 3.6.17.2, SR 3.6.17.4, and SR 3.6.17.5 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for SR 3.6.14.2, SR 3.6.14.4, and SR 3.6.14.5 under the Surveillance Frequency Control Program.

7. ISTS SR 3.6.17.4 requires two divider barrier seal test coupons to be removed and tested for tensile strength and elongation. This test has been replaced in ITS SR 3.6.14.4 with the current Surveillance Requirement to perform a differential pressure test on the divider barrier seal test coupons as provided in CTS 4.6.5.9.a and CTS Table 3.6-3.

8. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

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

1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~17~~ 14 Divider Barrier Integrity ~~(Ice Condenser)~~

1

BASES

BACKGROUND

The divider barrier consists of the operating deck and associated seals, personnel access doors, and equipment hatches that separate the upper and lower containment compartments. Divider barrier integrity is necessary to minimize bypassing of the ice condenser by the hot steam and air mixture released into the lower compartment during a Design Basis Accident (DBA). This ensures that most of the gases pass through the ice bed, which condenses the steam and limits pressure and temperature during the accident transient. Limiting the pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the door panels at the top of the condenser to open, which allows the air to flow out of the ice condenser into the upper compartment. The ice condenses the steam as it enters, thus limiting the pressure and temperature buildup in containment. The divider barrier separates the upper and lower compartments and ensures that the steam is directed into the ice condenser. The ice, together with the containment spray, is adequate to absorb the initial blowdown of steam and water from a DBA as well as the additional heat loads that would enter containment over several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves to ~~equalize pressures in containment and to~~ continue circulating heated air and steam from the lower compartment through the ice condenser, where the heat is removed by the remaining ice. 2

Divider barrier integrity ensures that the high energy fluids released during a DBA would be directed through the ice condenser and that the ice condenser would function as designed if called upon to act as a passive heat sink following a DBA.

BASES

APPLICABLE SAFETY ANALYSES

Divider barrier integrity ensures the functioning of the ice condenser to the limiting containment pressure and temperature that could be experienced following a DBA. The limiting DBAs considered relative to containment temperature and pressure 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.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed, with respect to containment Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in the inoperability of one train in ~~both~~ the Containment Spray System and one ~~the~~ ARS fan. 3

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum peak containment temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5~~B~~, "Containment Air Temperature." 2

In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

The divider barrier satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum equipment requirements to ensure that the divider barrier performs its safety function of ensuring that bypass leakage, in the event of a DBA, does not exceed the bypass leakage assumed in the accident analysis. Included are the requirements that the personnel access doors and equipment hatches in the divider barrier are OPERABLE and closed and that the divider barrier seal is properly installed and has not degraded with time. An exception to the requirement that the doors be closed is made to allow personnel transit ~~entry~~ through the divider barrier. The basis of this exception is the assumption that, for personnel transit, the time during which a door is open will be short (i.e., shorter than the Completion Time of 1 hour for Condition A). The divider barrier functions with the ice condenser to limit the pressure and temperature that could be expected following a DBA. 4

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the integrity of the divider barrier. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are low due to the pressure and temperature limitations of these MODES. As such, divider barrier integrity is not required in these MODES.

ACTIONS

A.1

If one or more personnel access doors or equipment hatches are inoperable or open, ~~except for personnel transit entry,~~ 1 hour is allowed to restore the door(s) and equipment hatches to OPERABLE status and the closed position. The 1 hour Completion Time is consistent with LCO 3.6.1, "Containment," which requires that containment be restored to OPERABLE status within 1 hour. 4

Condition A has been modified by a Note to provide clarification that~~, for this LCO,~~ separate Condition entry is allowed for each personnel access door or equipment hatch. 4

B.1

If the divider barrier seal is inoperable, 1 hour is allowed to restore the seal to OPERABLE status. The 1 hour Completion Time is consistent with LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

C.1 and C.2

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.17.1 14 1

Verification, by visual inspection, that all personnel access doors and equipment hatches between the upper and lower containment compartments are closed provides assurance that divider barrier integrity is maintained prior to the reactor being taken from MODE 5 to MODE 4. This SR is necessary because many of the doors and hatches may have been opened for maintenance during the shutdown.

SR 3.6.17.2 14 1

Verification, by visual inspection, that the personnel access door and equipment hatch seals, sealing surfaces, and alignments are acceptable provides assurance that divider barrier integrity is maintained. This inspection cannot be made when the door or hatch is closed. Therefore, SR 3.6.17.2 is required for each door or hatch that has been opened, prior to the final closure. Some doors and hatches may not be opened for long periods of time. [Those that use resilient materials in the seals must be opened and inspected at least once every 10 years periodically to provide assurance that the seal material has not aged to the point of degraded performance. The Frequency of 10 years is based on the known resiliency of the materials used for seals, the fact that the openings have not been opened (to cause wear), and operating experience that confirms that the seals inspected at this Frequency have been found to be acceptable. 14 1 5

OR

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

------------------------------REVIEWER'S NOTE------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 6

SR 3.6.17.3 14 1

Verification, by visual inspection, after each opening of a personnel access door or equipment hatch that it has been closed makes the operator aware of the importance of closing it and thereby provides additional assurance that divider barrier integrity is maintained while in applicable MODES.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~17~~.4 14 1

Conducting periodic physical property tests on divider barrier seal test coupons provides assurance that the seal material has not degraded in the containment environment, including the effects of irradiation with the reactor at power. The required test~~s include a tensile strength test [and a test for elongation]~~. INSERT 1 4 ~~[The Frequency of [18] months was developed considering such factors as the known resiliency of the seal material used, the inaccessibility of the seals and absence of traffic in their vicinity, and the unit conditions needed to perform the SR. 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.~~

~~OR~~ 5

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ 6

SR 3.6.~~17~~.5 14 1

Visual inspection of the seal around the perimeter provides assurance that the seal is properly secured in place. ~~[The Frequency of [18] months was developed considering such factors as the inaccessibility of the seals and absence of traffic in their vicinity, the strength of the bolts and mechanisms used to secure the seal, and the unit conditions needed to perform the SR. 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.~~

~~OR~~ 5

3 **INSERT 1**

consists of a differential pressure test. The test sequence will be as follows: two coupons will be tested to 60 psid; with no failures, the results are acceptable. If a failure occurs at 60 psid, four coupons will be tested to 30 psid; with no failures, the results are acceptable. If a failure occurs at 30 psid, five coupons will be sent to the manufacturer for LOCA environment simulation (radiation, humidity, temperature) and testing to 15 psid.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

6

REFERENCES U 1. FSAR, Section [6.2]. 2 7

U

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~17~~ Divider Barrier Integrity ~~(Ice Condenser)~~

14 1

BASES

BACKGROUND

The divider barrier consists of the operating deck and associated seals, personnel access doors, and equipment hatches that separate the upper and lower containment compartments. Divider barrier integrity is necessary to minimize bypassing of the ice condenser by the hot steam and air mixture released into the lower compartment during a Design Basis Accident (DBA). This ensures that most of the gases pass through the ice bed, which condenses the steam and limits pressure and temperature during the accident transient. Limiting the pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

In the event of a DBA, the ice condenser inlet doors (located below the operating deck) open due to the pressure rise in the lower compartment. This allows air and steam to flow from the lower compartment into the ice condenser. The resulting pressure increase within the ice condenser causes the intermediate deck doors and the door panels at the top of the condenser to open, which allows the air to flow out of the ice condenser into the upper compartment. The ice condenses the steam as it enters, thus limiting the pressure and temperature buildup in containment. The divider barrier separates the upper and lower compartments and ensures that the steam is directed into the ice condenser. The ice, together with the containment spray, is adequate to absorb the initial blowdown of steam and water from a DBA as well as the additional heat loads that would enter containment over several hours following the initial blowdown. The additional heat loads would come from the residual heat in the reactor core, the hot piping and components, and the secondary system, including the steam generators. During the post blowdown period, the Air Return System (ARS) returns upper compartment air through the divider barrier to the lower compartment. This serves to ~~equalize pressures in containment and to~~ continue circulating heated air and steam from the lower compartment through the ice condenser, where the heat is removed by the remaining ice. 2

Divider barrier integrity ensures that the high energy fluids released during a DBA would be directed through the ice condenser and that the ice condenser would function as designed if called upon to act as a passive heat sink following a DBA.

BASES

APPLICABLE SAFETY ANALYSES

Divider barrier integrity ensures the functioning of the ice condenser to the limiting containment pressure and temperature that could be experienced following a DBA. The limiting DBAs considered relative to containment temperature and pressure 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.

Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the ARS also function to assist the ice bed in limiting pressures and temperatures. Therefore, the postulated DBAs are analyzed, with respect to containment Engineered Safety Feature (ESF) systems, assuming the loss of one ESF bus, which is the worst case single active failure and results in the inoperability of one train in ~~both~~ the Containment Spray System and ~~the~~ one ARS fan. 3

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum peak containment temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5~~B~~, "Containment Air Temperature." 2

In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

The divider barrier satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum equipment requirements to ensure that the divider barrier performs its safety function of ensuring that bypass leakage, in the event of a DBA, does not exceed the bypass leakage assumed in the accident analysis. Included are the requirements that the personnel access doors and equipment hatches in the divider barrier are OPERABLE and closed and that the divider barrier seal is properly installed and has not degraded with time. An exception to the requirement that the doors be closed is made to allow personnel transit ~~entry~~ through the divider barrier. The basis of this exception is the assumption that, for personnel transit, the time during which a door is open will be short (i.e., shorter than the Completion Time of 1 hour for Condition A). The divider barrier functions with the ice condenser to limit the pressure and temperature that could be expected following a DBA. 4

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature requiring the integrity of the divider barrier. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are low due to the pressure and temperature limitations of these MODES. As such, divider barrier integrity is not required in these MODES.

ACTIONS

A.1

If one or more personnel access doors or equipment hatches are inoperable or open, except for personnel transit entry, 1 hour is allowed to restore the door(s) and equipment hatches to OPERABLE status and the closed position. The 1 hour Completion Time is consistent with LCO 3.6.1, "Containment," which requires that containment be restored to OPERABLE status within 1 hour. 4

Condition A has been modified by a Note to provide clarification that, for this LCO, separate Condition entry is allowed for each personnel access door or equipment hatch. 4

B.1

If the divider barrier seal is inoperable, 1 hour is allowed to restore the seal to OPERABLE status. The 1 hour Completion Time is consistent with LCO 3.6.1, which requires that containment be restored to OPERABLE status within 1 hour.

C.1 and C.2

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

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.17.1 14 1

Verification, by visual inspection, that all personnel access doors and equipment hatches between the upper and lower containment compartments are closed provides assurance that divider barrier integrity is maintained prior to the reactor being taken from MODE 5 to MODE 4. This SR is necessary because many of the doors and hatches may have been opened for maintenance during the shutdown.

SR 3.6.17.2 14 1

Verification, by visual inspection, that the personnel access door and equipment hatch seals, sealing surfaces, and alignments are acceptable provides assurance that divider barrier integrity is maintained. This inspection cannot be made when the door or hatch is closed. Therefore, SR 3.6.17.2 (14) is required for each door or hatch that has been opened, prior to the final closure. Some doors and hatches may not be opened for long periods of time. [Those that use resilient materials in the seals must be opened and inspected (periodically) at least once every 10 years to provide assurance that the seal material has not aged to the point of degraded performance. The Frequency of 10 years is based on the known resiliency of the materials used for seals, the fact that the openings have not been opened (to cause wear), and operating experience that confirms that the seals inspected at this Frequency have been found to be acceptable. 1 5

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 6

SR 3.6.17.3 14 1

Verification, by visual inspection, after each opening of a personnel access door or equipment hatch that it has been closed makes the operator aware of the importance of closing it and thereby provides additional assurance that divider barrier integrity is maintained while in applicable MODES.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~17~~.4 14 1

Conducting periodic physical property tests on divider barrier seal test coupons provides assurance that the seal material has not degraded in the containment environment, including the effects of irradiation with the reactor at power. The required test~~s include a tensile strength test [and a test for elongation]~~. ~~[The Frequency of [18] months was developed considering such factors as the known resiliency of the seal material used, the inaccessibility of the seals and absence of traffic in their vicinity, and the unit conditions needed to perform the SR. 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.~~ INSERT 1 4 5

~~OR~~

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

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~ 6

SR 3.6.~~17~~.5 14 1

Visual inspection of the seal around the perimeter provides assurance that the seal is properly secured in place. ~~[The Frequency of [18] months was developed considering such factors as the inaccessibility of the seals and absence of traffic in their vicinity, the strength of the bolts and mechanisms used to secure the seal, and the unit conditions needed to perform the SR. 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.~~ 5

~~OR~~

3 **INSERT 1**

consists of a differential pressure test. The test sequence will be as follows: two coupons will be tested to 60 psid; with no failures, the results are acceptable. If a failure occurs at 60 psid, four coupons will be tested to 30 psid; with no failures, the results are acceptable. If a failure occurs at 30 psid, five coupons will be sent to the manufacturer for LOCA environment simulation (radiation, humidity, temperature) and testing to 15 psid.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

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

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

6

REFERENCES

U

1. FSAR, Section [6.2].

2 7

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.14 BASES, DIVIDER BARRIER INTEGRITY

1. The heading and title for ISTS 3.6.17 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.17 is renumbered as ITS 3.6.14.

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

3. The SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans."

4. Changes have been made to be consistent with changes made to the Specification.

5. ISTS SR 3.6.17.2, SR 3.6.17.4, and SR 3.6.17.5 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.14.2, SR 3.6.14.4, and SR 3.6.14.5 under the Surveillance Frequency Control Program.

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

7. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.14, DIVIDER BARRIER INTEGRITY

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 15

ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

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

CONTAINMENT SYSTEMS

FLOOR DRAINS

LIMITING CONDITION FOR OPERATION

LCO 3.6.15 3.6.5.7 The ice condenser floor drains shall be OPERABLE.

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

ACTION:

Add proposed ACTIONS A and C

ACTION A
ACTION C ~~With the ice condenser floor drain inoperable, restore the floor drain to OPERABLE status prior to increasing the Reactor Coolant System temperature above 200°F.~~

A02

SURVEILLANCE REQUIREMENTS

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.6.15.2 4.6.5.7 Each ice condenser floor drain shall be demonstrated OPERABLE ~~at least once per 18 months during shutdown~~ by:

L01

a. Verifying that valve gate opening is not impaired by ice, frost or debris,

b. Verifying that the valve seat is not damaged,

c. Verifying that the valve gate opens when a force of less than or equal to 48 lbs is applied, and

d. Verifying that the drain line from the ice condenser floor to the containment lower compartment is unrestricted.

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ITS

A01

3.6.15

CONTAINMENT SYSTEMS

REFUELING CANAL DRAINS

LIMITING CONDITION FOR OPERATION

LCO 3.6.15 3.6.5.8 The refueling canal drains shall be OPERABLE.

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

ACTION:

ACTION B
ACTION C

With a refueling canal drain inoperable, restore the drain to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in at least COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

SR 3.6.15.1.a
SR 3.6.15.1.b

4.6.5.8 Each refueling canal drain shall be demonstrated OPERABLE:

a. Prior to increasing the Reactor Coolant System temperature above 200°F after each partial or complete filling of the canal with water by verifying that the plug is removed from the drain line and that the drain is not obstructed by debris, and

b. ~~At least once per 92 days~~ by verifying, through a visual inspection, that the plug is removed and there is no debris that could obstruct the drain.

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.6.15.1.c

Add proposed SR 3.6.15.1.c at a Frequency of ~~92 days~~ AND prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal.

M01

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ITS A01 3.6.15

CONTAINMENT SYSTEMS

FLOOR DRAINS

LIMITING CONDITION FOR OPERATION

LCO 3.6.15 3.6.5.7 The ice condenser floor drains shall be OPERABLE.

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

ACTION. [Add proposed ACTIONS A and C]

ACTION A
ACTION C
~~With the ice condenser floor drain inoperable, restore the floor drain to OPERABLE status prior to increasing the Reactor Coolant System temperature above 200°F.~~ A02

SURVEILLANCE REQUIREMENTS

SR 3.6.15.2 4.6.5.7 Each ice condenser floor drain shall be demonstrated OPERABLE [In accordance with the Surveillance Frequency Control Program] ~~at least once per 18 months during shutdown~~ by: LA01 L01

a. Verifying that valve gate opening is not impaired by ice, frost or debris,

b. Verifying that the valve seat is not damaged,

c. Verifying that the valve gate opens when a force of less than or equal to 48 lbs is applied, and

d. Verifying that the drain line from the ice condenser floor to the containment lower compartment is unrestricted.

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ITS | A01 | 3.6.15

CONTAINMENT SYSTEMS

REFUELING CANAL DRAINS

LIMITING CONDITION FOR OPERATION

LCO 3.6.15 — 3.6.5.8 The refueling canal drains shall be OPERABLE.

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

ACTION:

ACTION B — With a refueling canal drain inoperable, restore the drain to OPERABLE status within one hour

ACTION C — or be in at least HOT STANDBY within the next 6 hours and in at least COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

SR 3.6.15.1.a
SR 3.6.15.1.b — 4.6.5.8 Each refueling canal drain shall be demonstrated OPERABLE.

a. Prior to increasing the Reactor Coolant System temperature above 200°F after each partial or complete filling of the canal with water by verifying that the plug is removed from the drain line and that the drain is not obstructed by debris, and

b. ~~At least once per 92 days~~ [In accordance with the Surveillance Frequency Control Program] by verifying, through a visual inspection, that the plug is removed and there is no debris that could obstruct the drain. LA01

SR 3.6.15.1.c — Add proposed SR 3.6.15.1.c at a Frequency of ~~92 days~~ AND prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal. M01

DISCUSSION OF CHANGES
ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications- Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.6.5.7 Action does not state what action to take if the ice condenser floor drains are inoperable while in MODE 1, 2, 3, or 4; it only includes a requirement that the ice condenser floor drains be restored to OPERABLE status prior to increasing Reactor Coolant System temperature above 200°F (i.e., MODE 4). Therefore, entry into CTS 3.0.3 is required if CTS 3.6.5.7 is not met while in MODE 1, 2, 3, or 4. CTS 3.0.3 allows 1 hour to prepare for a shutdown and requires the unit to be in MODE 3 within 7 hours and MODE 5 within 37 hours. ITS 3.6.15 ACTION A requires that if one ice condenser floor drain is inoperable, it must be restored to OPERABLE status within 1 hour. ITS 3.6.15 ACTION C requires that if the Required Action and associated Completion Time are not met (i.e., the ice condenser floor drain is not restored to OPERABLE status in 1 hour), the unit must be in MODE 3 within 6 hours and MODE 5 within 36 hours. This changes the CTS by stating the ACTIONS within the Specification rather than deferring to CTS 3.0.3. In addition, it deletes the Actions to restore the limits prior to entering MODE 4.

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 3.6.5.7 is silent on these actions, deferring to CTS 3.0.3 for the actions to accomplish this. This change is acceptable because the ACTIONS specified in ITS 3.6.15 adopt ISTS structure for placing the unit outside the MODE of Applicability without changing the time specified to enter MODE 3 and MODE 5. In addition, deletion of the current Actions of CTS 3.6.5.7 is acceptable because CTS 3.0.4 (ITS LCO 3.0.4) already precludes entering the MODE of Applicability when the LCO is not met. Therefore, it is not necessary to include these requirements as specific actions in ITS 3.6.15. This change is designated as administrative because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 4.6.5.8.a requires each refueling canal drain be demonstrated OPERABLE prior to increasing the Reactor Coolant System temperature above 200°F after each partial or complete filling of the canal with water. CTS 4.6.5.8.b requires each refueling canal drain to be demonstrated OPERABLE at least once per 92 days. ITS SR 3.6.15.1 adds a new Surveillance to verify by visual inspection every 92 days AND prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal, that there is no debris present in the upper

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DISCUSSION OF CHANGES
ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

compartment or refueling canal that could obstruct the refueling canal drain. This changes the CTS by adding the additional Surveillance verification. (The change to relocate the specified Frequency of 92 days to the Surveillance Frequency Control Program is discussed in DOC LA01).

The purpose of the additional Surveillance of ITS SR 3.6.15.1 is to provide additional assurance the required refueling canal drains are OPERABLE. Prior to and during operation, the debris could be present in the upper containment compartment or refueling canal that eventually may obstruct the refueling canal drain. This change is acceptable, because it provides additional assurance that the refueling canal drain will be capable of performing its function. This change is designated as more restrictive, because it adds a Surveillance verification to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.5.7 requires each ice condenser floor drain to be demonstrated OPERABLE at least once per 18 months during shutdown. ITS SR 3.6.15.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." (The change of the requirement to perform the ice condenser floor drain Surveillance during shutdown is discussed in DOC L01). CTS 4.6.5.8.b requires each refueling canal drain be demonstrated OPERABLE by verifying through a visual inspection that the plug is removed and that there is no debris that could obstruct the drain at least once per 92 days. ITS SR 3.6.15.1 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequencies for these SRs and associated Bases to the Surveillance Frequency Control Program. An additional Surveillance Requirement has been added to ITS SR 3.6.15.1 to verify that no debris is present in the upper compartment or refueling canal that could obstruct the refueling canal drain every 92 days and prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal. (See DOC M01 for the discussion on adding the SR.) The 92 day Frequency for this Surveillance has been relocated to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain

in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequencies are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 8 – Deletion of Surveillance Requirement Shutdown Performance Requirements)* CTS 4.6.5.7 requires verification that each ice condenser floor drain is OPERABLE every 18 months during shutdown. ITS SR 3.6.15.2 requires the same testing at a Frequency of "In accordance with the Surveillance Frequency Control Program," with no restriction as to when (i.e., during shutdown) the test can be performed. This changes the CTS by deleting the requirement to perform the Surveillances during shutdown. (The change to relocate the specified Frequency to the Surveillance Frequency Control Program is discussed in DOC LA01.)

The purpose of CTS 4.6.5.7 is to ensure the ice condenser floor drain is OPERABLE. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The proposed Surveillance does not include the restriction on unit conditions. Portions of the ice condenser floor drain Surveillance Requirement could be performed in other than shutdown conditions, without jeopardizing safe plant operations. The control of the unit conditions appropriate to perform the test is an issue for procedures and scheduling, and has been determined by the NRC Staff to be unnecessary as a Technical Specification restriction. As indicated in Generic Letter 91-04, allowing this control is consistent with the vast majority of other Technical Specification Surveillances that do not dictate unit conditions for the Surveillance. This change is designated as less restrictive, because the Surveillance may be performed at plant conditions other than shutdown.

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

3.6 CONTAINMENT SYSTEMS

3.6.~~18~~ 15 Containment Recirculation Drains ~~(Ice Condenser)~~ 1

3.6.5.7
3.6.5.8

LCO 3.6.~~18~~ 15 The ice condenser floor drains and the refueling canal drains shall be OPERABLE.

Applicability

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

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.6.5.7 Actions	A. One ice condenser floor drain inoperable.	A.1 Restore ice condenser floor drain to OPERABLE status.	1 hour
3.6.5.8 Actions	B. One refueling canal drain inoperable.	B.1 Restore refueling canal drain to OPERABLE status.	1 hour
3.6.5.7 Actions 3.6.5.8 Actions	C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours

CTS

Containment Recirculation Drains (Ice Condenser)
3.6.18 15 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.6.5.8 DOC M01	SR 3.6.18.1 15	Verify, by visual inspection, that: a. Each refueling canal drain plug is removed. ; b. Each refueling canal drain is not obstructed by debris, ; and c. No debris is present in the upper compartment or refueling canal that could obstruct the refueling canal drain.	[92 days 1 3 OR 4 In accordance with the Surveillance Frequency Control Program] 4 3 AND Prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal
4.6.5.7	SR 3.6.18.2 15	Verify for each ice condenser floor drain that the: a. Valve gate opening is not impaired by ice, frost, or debris. ; b. Valve seat shows no evidence of damage. ; c. Valve gate opening force is ≤ [66] 48 lb. ; and d. Drain line from the ice condenser floor to the lower compartment is unrestricted.	[[18] months 1 3 2 OR 4 In accordance with the Surveillance Frequency Control Program] 4 2 5 4 3

3.6 CONTAINMENT SYSTEMS

3.6.~~18~~ 15 Containment Recirculation Drains ~~(Ice Condenser)~~ 1

3.6.5.7
3.6.5.8 LCO 3.6.~~18~~ 15 The ice condenser floor drains and the refueling canal drains shall be OPERABLE.

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
3.6.5.7 Actions	A. One ice condenser floor drain inoperable.	A.1 Restore ice condenser floor drain to OPERABLE status.	1 hour
3.6.5.8 Actions	B. One refueling canal drain inoperable.	B.1 Restore refueling canal drain to OPERABLE status.	1 hour
3.6.5.7 Actions 3.6.5.8 Actions	C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

CTS

Containment Recirculation Drains (Ice Condenser) 1
3.6.18 15

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.6.5.8 DOC M01 SR 3.6.18.1 15	Verify, by visual inspection, that: a. Each refueling canal drain plug is removed. ; b. Each refueling canal drain is not obstructed by debris, ; and c. No debris is present in the upper compartment or refueling canal that could obstruct the refueling canal drain.	[92 days 1 3 OR 4 In accordance with the Surveillance Frequency Control Program] 4 3 AND Prior to entering MODE 4 from MODE 5 after each partial or complete fill of the canal
4.6.5.7 SR 3.6.18.2 15	Verify for each ice condenser floor drain that the: a. Valve gate opening is not impaired by ice, frost, or debris. ; b. Valve seat shows no evidence of damage. ; c. Valve gate opening force is ≤ 48 [66] lb. ; and d. Drain line from the ice condenser floor to the lower compartment is unrestricted.	[[18] months 1 3 2 OR 4 In accordance with the Surveillance Frequency Control Program] 4 2 5 4 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

1. The heading and title for ISTS 3.6.18 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.18 is renumbered as ITS 3.6.15.

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. ISTS SR 3.6.18.1 and SR 3.6.18.2 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.15.1 and SR 3.6.15.2 under the Surveillance Frequency Control Program.

4. Typographical/grammatical error corrected.

5. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

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

1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~18~~ 15 Containment Recirculation Drains ~~(Ice Condenser)~~ 1

BASES

BACKGROUND

The containment recirculation drains consist of the ice condenser drains and the refueling canal drains. The ice condenser is partitioned into 24 bays, each having a pair of inlet doors that open from the bottom plenum to allow the hot steam-air mixture from a Design Basis Accident (DBA) to enter the ice condenser. ~~Twenty of the 24 bays have an ice condenser floor drain at the bottom to drain the melted ice into the lower compartment~~ [INSERT 1] ~~(in the 4 bays that do not have drains, the water drains through the floor drains in the adjacent bays).~~ Each drain leads to a drain pipe that drops down several feet, then makes one or more 90° bends and exits into the lower compartment. A check (flapper) valve at the end of each pipe keeps warm air from entering during normal operation, but when the water exerts pressure, it opens to allow the water to spill into the lower compartment. This prevents water from backing up and interfering with the ice condenser inlet doors. The water delivered to the lower containment serves to cool the atmosphere as it falls through to the floor and provides a source of borated water at the containment sump for long term use by the Emergency Core Cooling System (ECCS) and the Containment Spray System during the recirculation mode of operation. 2

The two refueling canal drains are at low points in the refueling canal. During a refueling, plugs are installed in the drains and the canal is flooded to facilitate the refueling process. The water acts to shield and cool the spent fuel as it is transferred from the reactor vessel to storage. After refueling, the canal is drained and the plugs removed. In the event of a DBA, the refueling canal drains are the main return path to the lower compartment for Containment Spray System water sprayed into the upper compartment.

The ice condenser drains and the refueling canal drains function with the ice bed, the Containment Spray System, and the ECCS to limit the pressure and temperature that could be expected following a DBA.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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. Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the Air Return System (ARS) also function to assist the ice bed in limiting pressures and temperatures. Therefore, the

2 **INSERT 1**

The drains shall provide a flow area out of the ice condenser of at least 15 square feet. No more than two adjacent bays shall be without drains.

BASES

APPLICABLE SAFETY ANALYSES (continued)

analysis of the postulated DBAs, with respect to Engineered Safety Feature (ESF) systems, assumes the loss of one ESF bus, which is the worst case single active failure and results in one train of the Containment Spray System and one ~~train of the~~ ARS fan being rendered inoperable. 3

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5, "Containment Air Temperature." In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

The containment recirculation drains satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum requirements to ensure that the containment recirculation drains perform their safety functions. The ice condenser floor drain valve disks must be closed to minimize air leakage into and out of the ice condenser during normal operation and must open in the event of a DBA when water begins to drain out. The refueling canal drains must have their plugs removed and remain clear to ensure the return of Containment Spray System water to the lower containment in the event of a DBA. The containment recirculation drains function with the ice condenser, ECCS, and Containment Spray System to limit the pressure and temperature that could be expected following a DBA.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature, which would require the operation of the containment recirculation drains. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are low due to the pressure and temperature limitations of these MODES. As such, the containment recirculation drains are not required to be OPERABLE in these MODES.

BASES

ACTIONS

A.1

If one ice condenser floor drain is inoperable, 1 hour is allowed to restore the drain to OPERABLE status. 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

If one refueling canal drain is inoperable, 1 hour is allowed to restore the drain to OPERABLE status. 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, which requires that containment be restored to OPERABLE status in 1 hour.

C.1 and C.2

If the affected drain(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 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.~~18~~ 15 .1 1

Verifying the OPERABILITY of the refueling canal drains ensures that they will be able to perform their functions in the event of a DBA. This Surveillance confirms that the refueling canal drain plugs have been removed and that the drains are clear of any obstructions that could impair their functioning. In addition to debris near the drains, attention must be given to any debris that is located where it could be moved to the drains in the event that the Containment Spray System is in operation and water is flowing to the drains. SR 3.6.~~18~~ 15 .1 must be performed before entering MODE 4 from MODE 5 after every filling of the canal to ensure that the plugs have been removed and that no debris that could impair the drains was deposited during the time the canal was filled. ~~[The 92 day Frequency was developed considering such factors as the inaccessibility of the drains, the absence of traffic in the vicinity of the drains, and the redundancy of the drains.~~ 1 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR 4

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 5

15

SR 3.6.18.2 1

Verifying the OPERABILITY of the ice condenser floor drains ensures that they will be able to perform their functions in the event of a DBA. Inspecting the drain valve disk ensures that the valve is performing its function of sealing the drain line from warm air leakage into the ice condenser during normal operation, yet will open if melted ice fills the line following a DBA. Verifying that the drain lines are not obstructed ensures their readiness to drain water from the ice condenser. [The [18] month Frequency was developed considering such factors as the inaccessibility of the drains during power operation; the design of the ice condenser, which precludes melting and refreezing of the ice; and operating experience that has confirmed that the drains are found to be acceptable when the Surveillance is performed at an [18] month Frequency. Because of high radiation in the vicinity of the drains during power operation, this Surveillance is normally done during a shutdown. 4

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
--] 5

REFERENCES 1. U FSAR, Section s [6.2] and 6.5. 1 6

 1

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~18~~ 15 Containment Recirculation Drains ~~(Ice Condenser)~~ 1

BASES

BACKGROUND

The containment recirculation drains consist of the ice condenser drains and the refueling canal drains. The ice condenser is partitioned into 24 bays, each having a pair of inlet doors that open from the bottom plenum to allow the hot steam-air mixture from a Design Basis Accident (DBA) to enter the ice condenser. ~~Twenty of the 24 bays have an ice condenser floor drain at the bottom to drain the melted ice into the lower compartment~~ INSERT 1 ~~(in the 4 bays that do not have drains, the water drains through the floor drains in the adjacent bays).~~ 2 Each drain leads to a drain pipe that drops down several feet, then makes one or more 90° bends and exits into the lower compartment. A check (flapper) valve at the end of each pipe keeps warm air from entering during normal operation, but when the water exerts pressure, it opens to allow the water to spill into the lower compartment. This prevents water from backing up and interfering with the ice condenser inlet doors. The water delivered to the lower containment serves to cool the atmosphere as it falls through to the floor and provides a source of borated water at the containment sump for long term use by the Emergency Core Cooling System (ECCS) and the Containment Spray System during the recirculation mode of operation.

The two refueling canal drains are at low points in the refueling canal. During a refueling, plugs are installed in the drains and the canal is flooded to facilitate the refueling process. The water acts to shield and cool the spent fuel as it is transferred from the reactor vessel to storage. After refueling, the canal is drained and the plugs removed. In the event of a DBA, the refueling canal drains are the main return path to the lower compartment for Containment Spray System water sprayed into the upper compartment.

The ice condenser drains and the refueling canal drains function with the ice bed, the Containment Spray System, and the ECCS to limit the pressure and temperature that could be expected following a DBA.

APPLICABLE SAFETY ANALYSES

The limiting DBAs considered relative to containment temperature and pressure 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. Although the ice condenser is a passive system that requires no electrical power to perform its function, the Containment Spray System and the Air Return System (ARS) also function to assist the ice bed in limiting pressures and temperatures. Therefore, the

2 **INSERT 1**

The drains shall provide a flow area out of the ice condenser of at least 15 square feet. No more than two adjacent bays shall be without drains.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

analysis of the postulated DBAs, with respect to Engineered Safety Feature (ESF) systems, assumes the loss of one ESF bus, which is the worst case single active failure and results in one train of the Containment Spray System and one ~~train of the~~ ARS fan being rendered inoperable. (3)

The limiting DBA analyses (Ref. 1) show that the maximum peak containment pressure results from the LOCA analysis and is calculated to be less than the containment design pressure. The maximum peak containment atmosphere temperature results from the SLB analysis and is discussed in the Bases for LCO 3.6.5, "Containment Air Temperature." In addition to calculating the overall peak containment pressures, the DBA analyses include calculation of the transient differential pressures that occur across subcompartment walls during the initial blowdown phase of the accident transient. The internal containment walls and structures are designed to withstand these local transient pressure differentials for the limiting DBAs.

The containment recirculation drains satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO establishes the minimum requirements to ensure that the containment recirculation drains perform their safety functions. The ice condenser floor drain valve disks must be closed to minimize air leakage into and out of the ice condenser during normal operation and must open in the event of a DBA when water begins to drain out. The refueling canal drains must have their plugs removed and remain clear to ensure the return of Containment Spray System water to the lower containment in the event of a DBA. The containment recirculation drains function with the ice condenser, ECCS, and Containment Spray System to limit the pressure and temperature that could be expected following a DBA.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause an increase in containment pressure and temperature, which would require the operation of the containment recirculation drains. Therefore, the LCO is applicable in MODES 1, 2, 3, and 4.

The probability and consequences of these events in MODES 5 and 6 are low due to the pressure and temperature limitations of these MODES. As such, the containment recirculation drains are not required to be OPERABLE in these MODES.

BASES

ACTIONS

A.1

If one ice condenser floor drain is inoperable, 1 hour is allowed to restore the drain to OPERABLE status. 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

If one refueling canal drain is inoperable, 1 hour is allowed to restore the drain to OPERABLE status. 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, which requires that containment be restored to OPERABLE status in 1 hour.

C.1 and C.2

If the affected drain(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 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.~~18~~.1 (15) (1)

Verifying the OPERABILITY of the refueling canal drains ensures that they will be able to perform their functions in the event of a DBA. This Surveillance confirms that the refueling canal drain plugs have been removed and that the drains are clear of any obstructions that could impair their functioning. In addition to debris near the drains, attention must be given to any debris that is located where it could be moved to the drains in the event that the Containment Spray System is in operation and water is flowing to the drains. SR 3.6.~~18~~.1 (15) (1) must be performed before entering MODE 4 from MODE 5 after every filling of the canal to ensure that the plugs have been removed and that no debris that could impair the drains was deposited during the time the canal was filled. ~~[The 92 day Frequency was developed considering such factors as the inaccessibility of the drains, the absence of traffic in the vicinity of the drains, and the redundancy of the drains.~~ (4)

BASES

SURVEILLANCE REQUIREMENTS (continued)

OR 4

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

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
-----] 5

15

SR 3.6.18.2 1

Verifying the OPERABILITY of the ice condenser floor drains ensures that they will be able to perform their functions in the event of a DBA. Inspecting the drain valve disk ensures that the valve is performing its function of sealing the drain line from warm air leakage into the ice condenser during normal operation, yet will open if melted ice fills the line following a DBA. Verifying that the drain lines are not obstructed ensures their readiness to drain water from the ice condenser. [The [18] month Frequency was developed considering such factors as the inaccessibility of the drains during power operation; the design of the ice condenser, which precludes melting and refreezing of the ice; and operating experience that has confirmed that the drains are found to be acceptable when the Surveillance is performed at an [18] month Frequency. Because of high radiation in the vicinity of the drains during power operation, this Surveillance is normally done during a shutdown. 4

OR

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

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
-----] 5

REFERENCES U 1. FSAR, Section [6.2] s and 6.5 1 6

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

1. The heading and title for ISTS 3.6.18 include the parenthetical expression (Ice Condenser). This identifying information is not included in the Sequoyah Nuclear Plant (SQN) ITS. This information is provided in the NUREG to assist in identifying the appropriate Specifications 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, SQN design does not include the Spray Additive System (ISTS 3.6.7) or the Hydrogen Mixing System (ISTS 3.6.9). Therefore, ISTS 3.6.7 and ISTS 3.6.9 are not included in the SQN ITS and ISTS 3.6.18 is renumbered as ITS 3.6.15.

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

3. The SQN ARS design consists of two 100% capacity fans (and associated dampers) connected to common hydrogen collection headers servicing the primary containment. The SQN ARS design does not consist of two fully redundant ARS trains. Therefore, it is necessary to define the OPERABILITY requirements of the Air Return System in terms of "fans."

4. ISTS SR 3.6.18.1 and SR 3.6.18.2 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies for ITS SR 3.6.15.1 and SR 3.6.15.2 under the Surveillance Frequency Control Program.

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

6. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.6.15, CONTAINMENT RECIRCULATION DRAINS

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 16

RELOCATED/DELETED CURRENT TECHNICAL SPECIFICATIONS

CTS 3.6.2.2, LOWER CONTAINMENT VENT COOLERS

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

CTS 3.6.2.2

R01

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

LOWER CONTAINMENT VENT COOLERS

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two independent trains of lower containment vent coolers shall be OPERABLE with two coolers to each train.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one of the above required lower containment vent coolers inoperable, restore to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two lower containment vent coolers of the same train inoperable, restore 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

4.6.2.2 Each lower containment vent cooler shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each fan operates for at least 15 minutes.

b. At least once per 18 months by:

1. Verifying from the control room that each fan starts.

2. Verifying a cooling water flow rate of greater than or equal to 200 gpm to each cooler.

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CTS 3.6.2.2

R01

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

LOWER CONTAINMENT VENT COOLERS

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two independent trains of lower containment vent coolers shall be OPERABLE with two coolers to each train.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one of the above required lower containment vent coolers inoperable, restore to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two lower containment vent coolers of the same train inoperable, restore to OPERABLE status with 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

4.6.2.2 Each lower containment vent cooler shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each fan operates for at least 15 minutes.

b. At least once per 18 months by:

1. Verifying from the control room that each fan starts.

2. Verifying a cooling water flow rate of greater than or equal to 200 gpm to each cooler.

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DISCUSSION OF CHANGES
CTS 3.6.2.2, LOWER CONTAINMENT VENT COOLERS

ADMINISTRATIVE CHANGES

None

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

R01 CTS 3.6.2.2 provides requirements on the Lower Containment Vent Coolers. The Lower Containment Vent Coolers are designed to maintain an acceptable temperature within the lower containment compartments for the protection of equipment and controls during normal reactor operation and normal shutdown. Although two of the four lower compartment coolers operate to maintain the assumed equipment environmental qualification conditions during non-LOCA post-HELBs inside containment when the RCS is maintained at hot standby conditions, the Lower Containment Vent Coolers are not credited in any accident analyses in the UFSAR. Therefore, the ITS does not include this Specification. This changes the CTS relocating the Lower Containment Vent Coolers to the Technical Requirements Manual (TRM).

This change is acceptable because CTS 3.6.2.2 does not meet the 10 CFR 50.36(c)(2)(ii) criteria for inclusion into the ITS.

10 CFR 50.36(c)(2)(ii) Criteria Evaluation:

1. The Lower Containment Vent Coolers are not installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary prior to a DBA. The Lower Containment Vent Cooler Specification does not satisfy criterion 1.

2. The Lower Containment Vent Coolers are not a process variable, design feature, or operating restriction that is in an initial condition of a DBA or Transient Analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The Lower Containment Vent Cooler Specification does not satisfy criterion 2.

3. The Lower Containment Vent Coolers are not a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a DBA or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The Lower Containment Vent Cooler Specification does not satisfy criterion 3.

4. The Lower Containment Vent Coolers were found to be non-significant risk contributor to core damage frequency and offsite releases. Tennessee Valley Authority (TVA) has performed a plant-specific analysis to ensure that the Lower Containment Vent Coolers do not contain

DISCUSSION OF CHANGES
CTS 3.6.2.2, LOWER CONTAINMENT VENT COOLERS

constraints of prime importance in limiting the likelihood or severity of the accident sequences that are commonly found to be important to public health and safety.

Since the 10 CFR 50.36(c)(2)(ii) criteria have not been met, the Lower Containment Vent Coolers may be relocated out of the Technical Specifications. The Lower Containment Vent Cooler Specification will be relocated to the TRM. Changes to the TRM will be controlled by the provisions of 10 CFR 50.59. This change is designated as relocation because the specification did not meet the criteria in 10 CFR 50.36(c)(2)(ii) and has been relocated to the TRM.

REMOVED DETAIL CHANGES

None

LESS RESTRICTIVE CHANGES

None

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
CTS 3.6.2.2, LOWER CONTAINMENT VENT COOLERS

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 17

Improved Standard Technical Specifications (ISTS) Not Adopted in the Sequoyah ITS

ISTS 3.6.7, SPRAY ADDITIVE SYSTEM (ATMOSPHERIC, SUBATMOSPHERIC, ICE CONDENSER, AND DUAL)

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

3.6 CONTAINMENT SYSTEMS

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

LCO 3.6.7 The Spray Additive System shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spray Additive System inoperable.	A.1 Restore Spray Additive System to OPERABLE status.	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 3.6.7.1	Verify each spray additive manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	[31 days OR In accordance with the Surveillance Frequency Control Program]

1

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.2	Verify spray additive tank solution volume is ≥ [2568] gal and ≤ [4000] gal.	[184 days OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.7.3	Verify spray additive tank [NaOH] solution concentration is ≥ [30]% and ≤ [32]% by weight.	[184 days OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.7.4	Verify each spray additive automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[[18] months OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.7.5	Verify spray additive flow [rate] from each solution's flow path.	[5 years OR In accordance with the Surveillance Frequency Control Program]

1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.6.7, SPRAY ADDITIVE SYSTEM (ATMOSPHERIC, SUBATMOSPHERIC, ICE CONDENSER, AND DUAL)

1. ISTS 3.6.7, "Spray Additive System (Atmospheric, Subatmospheric, Ice Condenser, and Dual)" is not being adopted because Sequoyah Nuclear Plant (SQN) design does not include the Spray Additive System. ISTS 3.6.7 Bases Background Section states that the Spray Additive System is a subsystem of the Containment Spray System that assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a Design Basis Accident (DBA). ISTS 3.6.7 Bases Applicable Safety Analyses Section further states that the Spray Additive System is essential to the removal of airborne iodine within containment following a DBA. At SQN, the ice beds perform the function of removing iodine from the containment following a DBA. The major benefit of if the ice bed is its capacity to absorb molecular iodine from the containment atmosphere. The ice solution is adjusted to an alkaline pH which promotes iodine hydrolysis. Since the ice beds perform this function, there is no need for the Spray Additive System. Therefore, ISTS 3.6.7 is not included in the ITS.

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

B 3.6 CONTAINMENT SYSTEMS

B 3.6.7 Spray Additive System (Atmospheric, Subatmospheric, Ice Condenser, and Dual)

BASES

BACKGROUND

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

Radioiodine in its various forms is the fission product of primary concern in the evaluation of a DBA. It is absorbed by the spray from the containment atmosphere. To enhance the iodine absorption capacity of the spray, the spray solution is adjusted to an alkaline pH that promotes iodine hydrolysis, in which iodine is converted to nonvolatile forms. Because of its stability when exposed to radiation and elevated temperature, sodium hydroxide (NaOH) is the preferred spray additive. The NaOH added to the spray also ensures a pH value of between 8.5 and 11.0 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.

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.

Gravity Feed Systems Only

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.

1

BASES

BACKGROUND (continued)

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

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

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."

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

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

LCO

The Spray Additive System is necessary to reduce the release of radioactive material to the environment in the event of a DBA. To be considered OPERABLE, the volume and concentration of the spray additive solution must be sufficient to provide NaOH injection into the spray flow until the Containment Spray System suction path is switched from the RWST to the containment sump, and to raise the average spray solution pH to a level conducive to iodine removal, namely, to between [7.2 and 11.0]. This pH range maximizes the effectiveness of the iodine removal mechanism without introducing conditions that may induce caustic stress corrosion cracking of mechanical system components. In addition, it is essential that valves in the Spray Additive System flow paths are properly positioned and that automatic valves are capable of activating to their correct positions.

1

BASES

APPLICABILITY

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

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

ACTIONS

A.1

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

B.1 and B.2

If the Spray Additive System cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 84 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems. The extended interval to reach MODE 5 allows 48 hours for restoration of the Spray Additive System in MODE 3 and 36 hours to reach MODE 5. This is reasonable when considering the reduced pressure and temperature conditions in MODE 3 for the release of radioactive material from the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

SR 3.6.7.1

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

[The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
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SR 3.6.7.2

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

OR

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

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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.7.3

This SR provides verification of the NaOH concentration in the spray additive tank and is sufficient to ensure that the spray solution being injected into containment is at the correct pH level. [The 184 day Frequency is sufficient to ensure that the concentration level of NaOH in the spray additive tank remains within the established limits. This is based on the low likelihood of an uncontrolled change in concentration (the tank is normally isolated) and the probability that any substantial variance in tank volume will be detected.

OR

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

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
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1

SR 3.6.7.4

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

OR

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.6.7.5

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.

OR

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

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

REFERENCES 1. FSAR, Chapter [15].

1

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.7 BASES, SPRAY ADDITIVE SYSTEM (ATMOSPHERIC, SUBATMOSPHERIC, ICE CONDENSER, AND DUAL)

1. ISTS 3.6.7 Bases, "Spray Additive System (Atmospheric, Subatmospheric, Ice Condenser, and Dual)" are not included in the Sequoyah Nuclear Plant (SQN) ITS since the Specification, ISTS 3.6.7, has not been included in the SQN ITS.

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ISTS 3.6.9, HYDROGEN MIXING SYSTEM (ATMOSPHERIC, ICE CONDENSER, AND DUAL)

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

3.6 CONTAINMENT SYSTEMS

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

LCO 3.6.9 [Two] HMS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

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

1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.9.1	Operate each HMS train for ≥ 15 minutes.	[92 days OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.9.2	Verify each HMS train flow rate on slow speed is ≥ [4000] cfm.	[[18] months OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.9.3	Verify each HMS train starts on an actual or simulated actuation signal.	[[18] months OR In accordance with the Surveillance Frequency Control Program]

1

JUSTIFICATION FOR DEVIATIONS
ISTS 3.6.9, HYDROGEN MIXING SYSTEM (HMS) (ATMOSPHERIC, ICE CONDENSER, AND DUAL)

1. ISTS 3.6.9, Hydrogen Mixing System (HMS) (Atmospheric, Ice Condenser, and Dual) is not being adopted because Sequoyah Nuclear Plant (SQN) design does not include the HMS. The hydrogen mixing function is performed by the ITS 3.6.11, "Air Return System." Therefore, ISTS 3.6.9 is not included in the ITS.

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

B 3.6 CONTAINMENT SYSTEMS

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

BASES

BACKGROUND

The HMS reduces the potential for breach of containment due to a hydrogen oxygen reaction by providing a uniformly mixed post accident containment atmosphere, thereby minimizing the potential for local hydrogen burns due to a pocket of hydrogen above the flammable concentration. Maintaining a uniformly mixed containment atmosphere also ensures that the hydrogen monitors will give an accurate measure of the bulk hydrogen concentration and give the operator the capability of preventing the occurrence of a bulk hydrogen burn inside containment per 10 CFR 50.44, "Standards for Combustible Gas Control Systems in Light-Water-Cooled Reactors" (Ref. 1), and 10 CFR 50, GDC 41, "Containment Atmosphere Cleanup" (Ref. 2).

The post accident HMS is an Engineered Safety Feature (ESF) and is designed to withstand a loss of coolant accident (LOCA) without loss of function. The System has two independent trains, each consisting of two fans with their own motors and controls. Each train is sized for [4000] cfm. The two trains are initiated automatically on a Phase A containment isolation signal. The automatic action is to start the nonoperating hydrogen mixing fans on slow speed and shift the operating hydrogen mixing fans (if any) to slow speed. Each train is powered from a separate emergency power supply. Since each train fan can provide 100% of the mixing requirements, the System will provide its design function with a limiting single active failure.

Air is drawn from the steam generator compartments by the locally mounted mixing fans and is discharged toward the upper regions of the containment. This complements the air patterns established by the containment air coolers, which take suction from the operating floor level and discharge to the lower regions of the containment, and the containment spray, which cools the air and causes it to drop to lower elevations. The systems work together such that potentially stagnant areas where hydrogen pockets could develop are eliminated.

When performing their post accident hydrogen mixing function, the hydrogen mixing fans operate on slow speed to prevent motor overload in a post accident high pressure environment. The design flow rate on slow speed is based on the minimum air distribution requirements to eliminate stagnant hydrogen pockets. Each train is redundant (full capacity) and is powered from an independent ESF bus. The hydrogen mixing fans may

1

BASES

BACKGROUND (continued)

be operated on fast speed during normal operation when a containment air cooler is taken out of service. As such, the design flow rate of the hydrogen mixing fans for high speed operation is based on air distribution requirements during such normal operation.

APPLICABLE SAFETY ANALYSES

The HMS provides the capability for reducing the local hydrogen concentration to approximately the bulk average concentration. The limiting DBA relative to hydrogen concentration 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.

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

LCO

Two HMS trains must be OPERABLE, with power to each from an independent, safety related power supply. Each train typically consists of two fans with their own motors and controls and is automatically initiated by a Phase A containment isolation signal.

Operation with at least one HMS train provides the mixing necessary to ensure uniform hydrogen concentration throughout containment.

1

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BASES

APPLICABILITY

In MODES 1 and 2, the two HMS trains ensure the capability to prevent localized hydrogen concentrations above the flammability limit of 4.1 volume percent in containment assuming a worst case single active failure.

In MODE 3 or 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 HMS is low. Therefore, the HMS is not required in MODE 3 or 4.

In MODES 5 and 6, the probability and consequences of a LOCA or steam line break (SLB) are reduced due to the pressure and temperature limitations in these MODES. Therefore, the HMS is not required in these MODES.

ACTIONS

A.1

With one HMS train inoperable, the inoperable train must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE HMS train is adequate to perform the hydrogen mixing function. However, the overall reliability is reduced because a single failure in the OPERABLE train could result in reduced hydrogen mixing capability. The 30 day Completion Time is based on the availability of the other HMS train, the small probability of a LOCA or SLB occurring (that would generate an amount of hydrogen that exceeds the flammability limit), 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, and the availability of the Containment Spray System and Hydrogen Purge System.

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 HMS trains 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 Ignitor System/ HMS/ 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.

1

BASES

ACTIONS (continued)

---------------------------------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 HMS trains inoperable for up to 7 days. Seven days is a reasonable time to allow two HMS trains 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.

1

C.1

If an inoperable HMS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours. 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.

SURVEILLANCE REQUIREMENTS

SR 3.6.9.1

Operating each HMS train for ≥ 15 minutes ensures that each train is OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan and/or motor failure, or excessive vibration can be detected for corrective action. [The 92 day Frequency is consistent with Inservice Testing Program Surveillance Frequencies, operating experience, the known reliability of the fan motors and controls, and the two train redundancy available.

OR

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.6.9.2

Verifying that each HMS train flow rate on slow speed is ≥ [4000] cfm ensures that each train is capable of maintaining localized hydrogen concentrations below the flammability limit. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

OR

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

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

SR 3.6.9.3

This SR ensures that each HMS train responds properly to a containment cooling actuation signal. The Surveillance verifies that each fan starts on slow speed from the nonoperating condition and that each fan shifts to slow speed from fast operating condition. [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

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

OR

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

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

REFERENCES

1. 10 CFR 50.44.
2. 10 CFR 50, Appendix A, GDC 41.
3. Regulatory Guide 1.7, Revision [1].

1

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.9 BASES, HYDROGEN MIXING SYSTEM (ATMOSPHERIC, ICE CONDENSER, AND DUAL)

1. ISTS 3.6.9 Bases, "Hydrogen Mixing System (Atmospheric, Ice Condenser, and Dual)" are not included in the Sequoyah Nuclear Plant (SQN) ITS since the Specification, ISTS 3.6.9, has not been included in the SQN ITS.

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ISTS 3.6.11, IODINE CLEANUP SYSTEM (ICS) (ATMOSPHERIC AND SUBATMOSPHERIC)

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

3.6 CONTAINMENT SYSTEMS

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

LCO 3.6.11 Two ICS trains shall be OPERABLE.

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

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.11.1	Operate each ICS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	[31 days OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.11.2	Perform required ICS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

1

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.11.3	Verify each ICS train actuates on an actual or simulated actuation signal.	[[18] months OR In accordance with the Surveillance Frequency Control Program]
SR 3.6.11.4	[Verify each ICS filter bypass damper can be opened.	[[18] months OR In accordance with the Surveillance Frequency Control Program]]

1

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JUSTIFICATION FOR DEVIATIONS
ISTS 3.6.11, IODINE CLEANUP SYSTEM (ICS) (ATMOSPHERIC AND SUBATMOSPHERIC)

1. ISTS 3.6.11, "Iodine Cleanup System (Atmospheric and Subatmospheric)" is not being adopted because Sequoyah Nuclear Plant (SQN) is an Ice Condenser Plant. Therefore, ISTS 3.6.11, which is an atmospheric and subatmospheric specification is not included in the ITS.

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

B 3.6 CONTAINMENT SYSTEMS

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

BASES

BACKGROUND

The ICS is provided per GDC 41, "Containment Atmosphere Cleanup," GDC 42, "Inspection of Containment Atmosphere Cleanup Systems," and GDC 43, "Testing of Containment Atmosphere Cleanup Systems" (Ref. 1), to reduce the concentration of fission products released to the containment atmosphere following a postulated accident. The ICS would function together with the Containment Spray and Cooling systems following a Design Basis Accident (DBA) to reduce the potential release of radioactive material, principally iodine, from the containment to the environment.

The ICS consists of two 100% capacity, separate, independent, and redundant trains. Each train includes a heater, [cooling coils,] a prefilter, a demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of radioiodines, and a fan. Ductwork, valves and/or dampers, and instrumentation also form part of the system. The demisters function to reduce the moisture content of the airstream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure in sections of the main HEPA filter bank. The upstream HEPA filter and the charcoal adsorber section are credited in the analysis. The system initiates filtered recirculation of the containment atmosphere following receipt of a safety injection signal. The system design is described in Reference 2.

The demister is included for moisture (free water) removal from the gas stream. Heaters are used to heat the gas stream, which lowers the relative humidity. Continuous operation of each train for at least 10 hours per month with the heaters on reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the charcoal adsorbers.

The primary purpose of the heaters is to ensure that the relative humidity of the airstream entering the charcoal adsorbers is maintained below 70%, which is consistent with the assigned iodine and iodide removal efficiencies as per Regulatory Guide 1.52 (Ref. 3).

Two ICS trains are provided to meet the requirement for separation, independence, and redundancy. Each ICS train is powered from a separate Engineered Safety Features bus and is provided with a separate power panel and control panel. [Essential service water is required to supply cooling water to the cooling coils.]

BASES

BACKGROUND (continued)

During normal operation, the Containment Cooling System is aligned to bypass the ICS HEPA filters and charcoal adsorbers. For ICS operation following a DBA, however, the bypass dampers automatically reposition to draw the air through the filters and adsorbers.

APPLICABLE SAFETY ANALYSES

The DBAs that result in a release of radioactive iodine within containment are a loss of coolant accident (LOCA) or a rod ejection accident (REA). In the analysis for each of these accidents, it is assumed that adequate containment leak tightness is intact at event initiation to limit potential leakage to the environment. Additionally, it is assumed that the amount of radioactive iodine released is limited by reducing the iodine concentration present in the containment atmosphere.

The ICS design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 4) assume that only one train of the ICS is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive iodine provided by the remaining one train of this filtration system.

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

LCO

Two separate, independent, and redundant trains of the ICS are required to ensure that at least one is available, assuming a single failure coincident with a loss of offsite power.

APPLICABILITY

In MODES 1, 2, 3, and 4, iodine is a fission product that can be released from the fuel to the reactor coolant as a result of a DBA. The DBAs that can cause a failure of the fuel cladding are a LOCA, SLB, and REA. Because these accidents are considered credible accidents in MODES 1, 2, 3, and 4, the ICS must be operable to ensure the reduction in iodine concentration assumed in the accident analyses.

In MODES 5 and 6, the probability and consequences of a LOCA are low due to the pressure and temperature limitations of these MODES. The ICS is not required in these MODES to remove iodine from the containment atmosphere.

ACTIONS

A.1

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

BASES

ACTIONS (continued)

a. The availability of the OPERABLE redundant ICS train,

b. The fact that, even with no ICS train in operation, almost the same amount of iodine would be removed from the containment atmosphere through absorption by the Containment Spray System, and

c. The fact that the Completion Time is adequate to make most repairs.

B.1 and B.2

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

SURVEILLANCE REQUIREMENTS

SR 3.6.11.1

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

OR

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

-----------------------------------REVIEWER'S NOTE-----------------------------------
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
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SR 3.6.11.2

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

SR 3.6.11.3

The automatic startup test verifies that both trains of equipment start upon receipt of an actual or simulated test signal. [The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. Furthermore, the Frequency was developed considering that the system equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.11.1.

OR

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

[SR 3.6.11.4

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

OR

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

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

1. 10 CFR 50, Appendix A, GDC 41, GDC 42, and GDC 43.
2. FSAR, Section [6.5].
3. Regulatory Guide 1.52, Revision [2].
4. FSAR, Chapter [15].

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.11 BASES, IODINE CLEANUP SYSTEM (ICS) (ATMOSPHERIC, AND SUBATMOSPHERIC)

1. ISTS 3.6.11 Bases, "Iodine Cleanup System (ICS) (Atmospheric, and Subatmospheric)" are not included in the Sequoyah Nuclear Plant (SQN) ITS since the Specification, ISTS 3.6.11, has not been included in the SQN ITS.

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ENCLOSURE 2

VOLUME 12

SEQUOYAH NUCLEAR PLANT
UNIT 1 AND UNIT 2

IMPROVED TECHNICAL
SPECIFICATIONS CONVERSION

ITS SECTION 3.7
PLANT SYSTEMS

LIST OF ATTACHMENTS

ATTACHMENT 1

ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

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

ITS | A01 | ITS 3.7.1

3/4.7 PLANT SYSTEMS

3/4.7.1 ~~TURBINE CYCLE~~

[Main Steam] SAFETY VALVES [MSSVs] (A01)

LIMITING CONDITION FOR OPERATION (A02)

LCO 3.7.1 / SR 3.7.1.1: 3.7.1.1 [Five] Main steam safety valves (MSSVs) [per steam generator] shall be OPERABLE with lift settings as specified in Table 3.7-2. (A07) (M01)

Applicability: APPLICABILITY: MODES 1, 2 and 3.~~*~~

ACTION:

[Add proposed ACTIONS Note] (A03)
[Add proposed Required Action A.1] (A04)
[Add proposed Required Action A.2 Note] (L01)

ACTION A: a. With one or more MSSVs inoperable, operation may proceed provided, that within ~~4~~ [36] hours, ~~either the inoperable valve is restored to OPERABLE status or~~ the Power Range Neutron Flux High Setpoint trip is reduced per Table 3.7-1. (L02) (A05)

ACTION B: b. With the requirements of ACTION a., not met or with one or more steam generators [One or more steam generators] with less than two MSSVs OPERABLE be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN in the following 6 hours. (A07)

SURVEILLANCE REQUIREMENTS

[Add proposed SR Note] (L03)

SR 3.7.1.1: 4.7.1.1 No additional Surveillance Requirements other than those required by ~~Specification 4.0.5~~ [the Inservice Testing Program]. Following testing, lift settings shall be within ± 1%. (A06)

~~*With the reactor trip system breakers in the closed position.~~ (M01)

Table 3.7.1-1

TABLE 3.7-1

MAXIMUM ALLOWABLE POWER ~~RANGE NEUTRON FLUX HIGH SETPOINT WITH IN~~OPERABLE STEAM LINE SAFETY VALVES

A04

~~Maximum~~ Number of ~~In~~operable Safety Valves on Any Operating Steam Generator	Maximum Allowable Power ~~Range Neutron Flux High Setpoint~~ (Percent of RATED THERMAL POWER)
~~1~~ 4	62
~~2~~ 3	45
~~3~~ 2	28

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ITS A01 ITS 3.7.1

Table 3.7.1-2

TABLE 3.7-2

STEAM LINE SAFETY VALVES PER LOOP

LA01

VALVE NUMBER				LIFT SETTING psig (± 3%)*	NOZZLE SIZE
Loop 1	Loop 2	Loop 3	Loop 4		
1-1-522	1-1-517	1-1-512	1-1-527	1064 psig	16 sq. in.
1-1-523	1-1-518	1-1-513	1-1-528	1077 psig	16 sq. in.
1-1-524	1-1-519	1-1-514	1-1-529	1090 psig	16 sq. in.
1-1-525	1-1-520	1-1-515	1-1-530	1103 psig	16 sq. in.
1-1-526	1-1-521	1-1-516	1-1-531	1117 psig	16 sq. in.

LA02

*The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

LA01

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A01

ITS ITS 3.7.1

3/4.7 PLANT SYSTEMS

3/4.7.1 TURBINE CYCLE (A01)

MSSVs

Main Steam SAFETY VALVES

LIMITING CONDITION FOR OPERATION (A02)

LCO 3.7.1, SR 3.7.1.1: 3.7.1.1 [Five] Main steam safety valves (MSSVs) [per steam generator] shall be OPERABLE with lift settings as specified in Table 3.7-2. (A07)

Applicability: APPLICABILITY: Modes 1, 2 and 3*. (M01)

ACTION: [Add proposed ACTIONS Note] (A03) [Add proposed Required Action A.1] (A04) [Add proposed Required Action A.2 Note] (L01)

ACTION A: a. With one or more MSSVs inoperable, operation may proceed provided, that within 4 [36] hours, either the inoperable valve is restored to OPERABLE status or the Power Range Neutron Flux High Setpoint trip is reduced per Table 3.7-1. (L02) (A05)

ACTION B: [One or more steam generators] (A07)

b. With the requirements of Action a., not met or with one or more steam generators with less than two MSSVs OPERABLE be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN in the following 6 hours.

SURVEILLANCE REQUIREMENTS

[Add proposed SR Note] (L03)

SR 3.7.1.1: 4.7.1.1 No additional Surveillance Requirements other than those required by Specification 4.0.5 [the Inservice Testing Program]. Following testing, lift settings shall be within ± 1%. (A06)

*With the reactor trip system breakers in the closed position. (M01)

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A01

ITS

ITS 3.7.1

Table 3.7.1-1

TABLE 3.7-1

MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES

A04

Maximum Number of Inoperable Safety Valves on Any Operating Steam Generator	Maximum Allowable Power Range Neutron Flux High Setpoint (Percent of RATED THERMAL POWER)
1 → 4	62
2 → 3	45
3 → 2	28

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A01

ITS

ITS 3.7.1

Table 3.7.1-2

TABLE 3.7-2

STEAM LINE SAFETY VALVES PER LOOP

psig

LA01

VALVE NUMBER				LIFT SETTING* (±3%)	NOZZLE SIZE
Loop 1	Loop 2	Loop 3	Loop 4		
2-1-522	2-1-517	2-1-512	2-1-527	1064 psig	16 sq. in.
2-1-523	2-1-518	2-1-513	2-1-528	1077 psig	16 sq. in.
2-1-524	2-1-519	2-1-514	2-1-529	1090 psig	16 sq. in.
2-1-525	2-1-520	2-1-515	2-1-530	1103 psig	16 sq. in.
2-1-526	2-1-521	2-1-516	2-1-531	1117 psig	16 sq. in.

LA02

*The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

LA01

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.7.1.1 states that main steam safety valves (MSSVs) shall be OPERABLE with lift settings as specified in Table 3.7-2. CTS Table 3.7-2 lists lift setting pressures for five safety valves in each of the four loops. ITS LCO 3.7.1 requires five MSSVs per steam generator to be OPERABLE. This changes the CTS by combining the current LCO requirement and portions of CTS Table 3.7-2 into a single ITS LCO requirement.

This change is acceptable because the number of MSSVs required OPERABLE under the various conditions has not changed. This change results in a format change only to comply with the manner in which the ISTS presents the MSSV requirements. This change is designated as an administrative change since it does not result is any technical changes to the CTS.

A03 CTS 3.7.1.1 ACTIONS a and b provide compensatory actions for one or more inoperable MSSVs. CTS 3.7.1.1 ACTION a requires that within 4 hours the MSSV(s) be restored to OPERABLE status or the Power Range Neutron Flux High Setpoint trip be reduced in accordance with the requirements of CTS Table 3.7-1. CTS 3.7.1.1 ACTION b requires a unit shutdown, if the requirements of ACTION a are not met or if one or more steam generators have less than two OPERABLE MSSVs. ITS 3.7.1 ACTIONS Note states "Separate Condition entry is allowed for each MSSV." This changes the CTS by explicitly specifying separate condition entry for each inoperable MSSV.

The purpose of the CTS ACTIONS is to allow separate condition entry for each inoperable MSSV. Each time it is discovered that an MSSV is inoperable, entry is required and the specified Completion Time is allowed to complete the compensatory actions. The ITS 3.7.1 ACTIONS Note allows a separate Completion Time clock for each MSSV that is inoperable. This change is acceptable, because it only provides clarification of the Completion Time when one valve is inoperable and, subsequently, a second valve becomes inoperable. This change is designated as administrative, because it does not result in a technical change to the Specifications.

A04 CTS 3.7.1.1 ACTION a states that the Power Range Neutron Flux - High Setpoint trip must be reduced per CTS Table 3.7-1 when one or more MSSVs are found to be inoperable. CTS Table 3.7-1 provides the maximum allowable Power Range Neutron Flux - High Setpoint corresponding to the maximum number of inoperable MSSVs on any operating steam generator. ITS 3.7.1

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

ACTION A requires both a reduction in THERMAL POWER and a reduction in the Power Range Neutron Flux - High reactor trip setpoint consistent with the requirements of ITS Table 3.7.1-1. The Table has been revised slightly to provide the associated maximum allowable power for the number of OPERABLE MSSVs. This changes the CTS by adding an additional explicit statement to reduce THERMAL POWER consistent with ITS Table 3.7.1-1 and by stating the maximum allowable power as a function of OPERABLE, instead of inoperable, MSSVs.

The purpose of CTS 3.7.1.1 ACTION a is to reduce the Power Range Neutron Flux – High Setpoint to within the limits of the safety analyses. Current plant operation dictates that THERMAL POWER is reduced before reducing the setpoints to prevent a reactor trip. Explicitly stating this practice in TS and stating the maximum power level in terms of OPERABLE instead of inoperable MSSVs does not change how the plant is operated. This change is considered administrative, because it does not result in technical changes to the CTS.

A05 CTS 3.7.1.1 ACTION a states that with one or more MSSVs inoperable, either restore the inoperable valves to OPERABLE status or reduce the Power Range Neutron Flux – High Setpoints. ITS 3.7.1 ACTION A does not include the restoration requirement, only the alternate compensatory measure. This changes the CTS by eliminating the explicit statement to restore the MSSV(s) to OPERABLE status.

This change is acceptable, because it does not result in a technical change to the Technical Specifications. Restoration of compliance with the LCO is always an option in an ACTION, so eliminating the restoration ACTION from the CTS has no effect. In both the CTS and the ITS, if the inoperable MSSV(s) are not restored, actions are taken that result in reducing reactor power to within the relief capability of the OPERABLE MSSVs within 4 hours. This change is designated as administrative, because it does not result in a technical change to the CTS.

A06 CTS 4.7.1.1 requires no additional Surveillance Requirements on the MSSVs other than those required by Specification 4.0.5. ITS SR 3.7.1.1 requires verification of each MSSV lift setpoint in accordance with the Inservice Testing Program with a Frequency of in accordance with the Inservice Testing Program. This changes the CTS by stating MSSV testing is performed in accordance with the Inservice Testing Program, and that the Frequency is in accordance with the Inservice Testing Program.

The purpose of CTS 4.7.1.1 is to verify each MSSV lift setpoint is tested in accordance with Specification 4.0.5, which provides the requirements for the Inservice Testing Program. This change is acceptable, because the Frequency regarding the MSSVs testing remains the same. The inservice testing requirements of CTS 4.0.5 have been moved 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 a technical change to the CTS.

A07 CTS 3.7.1.1 requires the MSSVs to be OPERABLE with settings as specified in Table 3.7-2. CTS 3.7.1.1 ACTION a requires, in part, that with one or more

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

MSSVs inoperable to reduce the Power Range Neutron Flux High setpoint per Table 3.7-1. ITS 3.7.1 requires five MSSVs per steam generator to be OPERABLE. ITS 3.7.1 ACTION A requires that with one or more steam generators with one or more MSSVs inoperable to reduce the Power Range Neutron Flux High setpoints. This changes the CTS by addressing MSSVs per steam generator instead of referring to CTS Table 3.7-1.

The change is acceptable because the CTS requirements remain unchanged. CTS Table 3.7-1 presents the maximum allowable power range neutron flux setpoint with inoperable steam line safety valves and lists the maximum number of inoperable safety valves on any operating steam generator. ITS 3.7.1 ACTION A specifically states that the ACTION is for one or more steam generators without requiring the use of a table. This is a change in presentation and is designated as an administrative change because it does not result in a technical change to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.7.1.1 requires the MSSVs to be OPERABLE in MODES 1 and 2, and in MODE 3 with the reactor trip system breakers in the closed position. ITS 3.7.1 requires the MSSVs to be OPERABLE in MODES 1, 2, and 3. This changes the CTS Applicability by removing the MODE 3 Applicability limitation of "with the reactor trip system breakers in the closed position," essentially expanding the LCO Applicability to include all of MODE 3.

The purpose of CTS 3.7.1.1 is to minimize the time allowed to operate at RATED THERMAL POWER with inoperable MSSVs. This change has modified the MODE 3 Applicability limitation of "with the reactor trip system breakers in the closed position." This effectively expands the LCO Applicability to include all of MODE 3, regardless of the position of the reactor trip system breakers. This change is acceptable, because it provides additional assurance that the MSSVs are available to perform their function when required. This change is designated as more restrictive, because the LCO is Applicable under more plant conditions than is required in CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS Table 3.7-2 is modified by a footnote (footnote*) that states, "The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure." ITS 3.7.1 does not contain this information. This changes the CTS by moving details on setting the lift pressure to the ITS Bases.

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

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 lift settings and the definition of OPERABLE states that the components must be capable of performing their safety function. It is understood that the MSSVs must be adjusted to lift at the settings given under the conditions that the safety analysis assumes the MSSVs will operate. 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 details for meeting Technical Specification requirements are being removed from the Technical Specifications to the ITS Bases.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS Table 3.7-2 specifies the MSSV number and associated lift settings and nozzle size for each MSSV. ITS Table 3.7.1-2 only provides the MSSV number and associated lift setting. This changes the CTS by deleting the required nozzle size and relocating this detail to the UFSAR.

The removal of details 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 valve numbers and corresponding lift setting. The nozzle size does not normally vary, because it is a function of the design of the valve. The lift settings can vary and are adjustable. Therefore, this information is important to be retained in the Technical Specification. Also, this change is acceptable, because the removed information 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 information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 (*Category 4 – Relaxation of Required Action)* CTS 3.7.1.1 ACTION a states, in part, that with one or more MSSVs inoperable, reduce the Power Range Neutron Flux - High Setpoint trip within 4 hours. ITS 3.7.1 Required Action A.2 also requires the Power Range Neutron Flux - High trip setpoint to be reduced, but is modified by a Note (Required Action A.2 Note) stating that this action is only required in MODE 1. This changes the CTS by only requiring the Power Range Neutron Flux - High Setpoint trip be reduced when in MODE 1.

The purpose of CTS 3.7.1.1 is to ensure that the MSSVs are capable of relieving Main Steam System pressure. In MODES 2 and 3, the Reactor Trip System trips specified in LCO 3.3.1, "Reactor Trip System Instrumentation," provide sufficient protection. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

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 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 repair period. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L02 (*Category 3 – Relaxation of Completion Time)* CTS 3.7.1.1 ACTION a specifies the compensatory actions when one or more MSSVs are inoperable. The action allows operation to continue provided that within 4 hours, either the inoperable MSSV(s) are restored to OPERABLE status or the Power Range Neutron Flux - High Setpoint trip is reduced per Table 3.7-1. ITS 3.7.1 Required Action A.2 requires the reduction of the Power Range Neutron Flux - High reactor trip setpoint to less than or equal to the Maximum Allowable percent RTP specified in Table 3.7.1-1 within 36 hours. This changes the CTS by extending the time allowed to reduce the Power Range Neutron Flux - High reactor trip setpoints. The discussion of the change that deletes the restoration option is discussed in DOC A05.

The purpose of CTS 3.7.1.1 ACTION a is to limit the time the unit can operate with inoperable MSSVs without reducing the Power Range Neutron Flux – High reactor trip setpoints. 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, and the low probability of a DBA occurring during the allowed Completion Time. This change extends the time allowed to reduce the Power Range Neutron Flux - High reactor trip setpoints when the MSSVs are inoperable. The time extension is from 4 hours to 36 hours. However, the time to reduce THERMAL POWER to within the same limits is maintained in ITS 3.7.1 Required Action A.1, as described in DOC A04. This change is acceptable since the Completion Time of 36 hours is based on a reasonable time to correct the MSSV inoperability, the time required to perform the power reduction, operating experience in resetting the channels of a protective function, and on the low probability of the occurrence of a transient that could result in steam generator overpressure during this period. In addition, the actual reactor power level continues to be required to be reduced to within the same limits within 4 hours. Thus, operation of the unit at RATED THERMAL POWER with an inoperable MSSV is still only allowed for 4 hours, consistent with the current allowance. 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.

L03 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.7.1.1 requires verification of each MSSV lift setpoint pursuant to Specification 4.0.5. ITS SR 3.7.1.1 requires the same testing, however, a Note has been included that requires the performance of the lift setpoint verification only in MODES 1 and 2. This changes the CTS by adding a Note that requires performance of the MSSV lift setpoint verification only in MODES 1 and 2.

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DISCUSSION OF CHANGES
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

The purpose of CTS 4.7.1.1 is to perform the MSSV lift setpoint verification in accordance with the Frequency of the Inservice Test Program (CTS 4.0.5). This change is acceptable, because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The SR is modified by a Note that states the Surveillance is only required to be performed in MODES 1 and 2. The Note allows entry into and operation in MODE 3 prior to performing the SR. By allowing entry into MODE 3 prior to performing the SR, testing can be performed at hot conditions. Otherwise, if the MSSVs are not tested at hot conditions, the lift setting pressure is corrected to ambient conditions of the valve at operating temperature and pressure. This change is designated as less restrictive because Surveillances will be performed in fewer operating Conditions than in the CTS.

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

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

3.7.1 LCO 3.7.1 [Five] MSSVs per steam generator shall be OPERABLE. (2)

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

DOC A03 Separate Condition entry is allowed for each MSSV.

~~-----------------------REVIEWER'S NOTE-----------------------~~
~~The * noted text is required for units that are licensed to operate at partial power with a positive Moderator Temperature Coefficient (MTC).~~
~~--~~ (3)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One or more steam generators with one MSSV inoperable [and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels]*~~.	~~A.1 Reduce THERMAL POWER to ≤ [72] % RTP.~~	~~4 hours~~ (4)
ACTION a DOC A04: ~~B~~ A. One or more steam generators with ~~two~~ one or more MSSVs inoperable. ~~[OR~~ ~~One or more steam generators with one MSSV inoperable and the MTC positive at any power level.]*~~	~~B~~ A.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs. AND	4 hours (4) (4)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 ACTION a	~~B~~ A.2 --------------NOTE-------------- Only required in MODE 1. ------------------------------------- Reduce the Power Range Neutron Flux - High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	36 hours (4)
ACTION b ~~C~~ B. Required Action and associated Completion Time not met. OR One or more steam generators with ≥ ~~[~~4~~]~~ MSSVs inoperable. (2)	~~C~~ B.1 Be in MODE 3. AND ~~C~~ B.2 Be in MODE 4.	6 hours (4) 12 hours (4)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	DOC L03 ------------------------------NOTE------------------------------ Only required to be performed in MODES 1 and 2. -- 3.7.1.1 4.7.1.1 Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within ±1%.	In accordance with the Inservice Testing Program

CTS

Table 3.7-1

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power

NUMBER OF OPERABLE MSSVs PER STEAM GENERATOR	MAXIMUM ALLOWABLE POWER (% RTP)
[4]	~~[65]~~ 62
3	~~[46]~~ 45
2	[28]

2

Table 3.7-2

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

VALVE NUMBER				LIFT SETTING (psig ± [3]%)
STEAM GENERATOR				
#1	#2	[#3]	[#4]	
[-]	[-]	[-]	[-]	[-]
[-]	[-]	[-]	[-]	[-]
[-]	[-]	[-]	[-]	[-]
[-]	[-]	[-]	[-]	[-]

INSERT 1

2

CTS 3.7.1

Table 3.7-2

2

INSERT 1 (Unit 1)

1-1-522	1-1-517	1-1-512	1-1-527	1064
1-1-523	1-1-518	1-1-513	1-1-528	1077
1-1-524	1-1-519	1-1-514	1-1-529	1090
1-1-525	1-1-520	1-1-515	1-1-530	1103
1-1-526	1-1-521	1-1-516	1-1-531	1117

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CTS

MSSVs
3.7.1

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

3.7.1 LCO 3.7.1 [Five] MSSVs per steam generator shall be OPERABLE. 2

Applicability APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----NOTE-----

DOC A03 Separate Condition entry is allowed for each MSSV.

-----REVIEWER'S NOTE-----

The * noted text is required for units that are licensed to operate at partial power with a positive Moderator Temperature Coefficient (MTC). 3

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more steam generators with one MSSV inoperable [and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels]*.	A.1 Reduce THERMAL POWER to ≤ [72] % RTP.	4 hours
(ACTION a, DOC A04) B. A. One or more steam generators with two one or more MSSVs inoperable. [OR One or more steam generators with one MSSV inoperable and the MTC positive at any power level.]*	B. A.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs. AND	4 hours

4 4 4

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CTS

MSSVs
3.7.1

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01		~~B~~ A.2 --------------NOTE-------------- Only required in MODE 1. -------------------------------------		4
ACTION a		Reduce the Power Range Neutron Flux - High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	36 hours	
ACTION b	~~C~~ B. Required Action and associated Completion Time not met.	~~C~~ B.1 Be in MODE 3.	6 hours	4
		AND		
	OR	~~C~~ B.2 Be in MODE 4.	12 hours	4
	One or more steam generators with ≥ ~~[~~4~~]~~ MSSVs inoperable.			2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
	SR 3.7.1.1	------------------------------NOTE------------------------------	
DOC L03		Only required to be performed in MODES 1 and 2. --	
3.7.1.1 4.7.1.1		Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within ±1%.	In accordance with the Inservice Testing Program

CTS

Table 3.7-1

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power

NUMBER OF OPERABLE MSSVs PER STEAM GENERATOR	MAXIMUM ALLOWABLE POWER (% RTP)
[4]	[65] 62
3	[46] 45
2	[28]

2

1

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Table 3.7-2

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

VALVE NUMBER				LIFT SETTING (psig ± [3]%)
STEAM GENERATOR				
#1	#2	[#3]	[#4]	
[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]
[ ]	[ ]	[ ]	[ ]	[ ]

INSERT 1

2

CTS

Table 3.7-2

2

INSERT 1 (Unit 2)

2-1-522	2-1-517	2-1-512	2-1-527	1064
2-1-523	2-1-518	2-1-513	2-1-528	1077
2-1-524	2-1-519	2-1-514	2-1-529	1090
2-1-525	2-1-520	2-1-515	2-1-530	1103
2-1-526	2-1-521	2-1-516	2-1-531	1117

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVs)

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. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

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

4. The information in ACTION A and the second part of Condition B related to operation at partial power with a positive Moderator Temperature Coefficient has been deleted. Additionally, first part of Condition B has been changed to reflect SQN's current licensing basis, which provides for continued unit operation with one or more MSSVs inoperable, provided compensatory measures are taken. Subsequent ACTIONS have been renumbered as necessary.

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

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

BASES

BACKGROUND	The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing ~~a heat sink~~ for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available. (2) ~~[~~Five~~]~~ MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in ~~the~~ U FSAR, Section ~~[10.3.1]~~ 10.3.2 (Ref. 1). The MSSVs must have sufficient capacity to limit the secondary system pressure to ≤ 110% of the steam generator design pressure in order to meet the requirements of the ASME Code, Section III (Ref. 2). The MSSV design includes staggered setpoints, according to Table 3.7.1-2 in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves following a turbine reactor trip. (1) (2)
APPLICABLE SAFETY ANALYSES	The design basis for the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure for any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and transient analysis. The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in ~~the~~ U FSAR, Section ~~[15.2]~~ 15.2.7 (Ref. 3). Of these, the full power turbine trip without steam dump is ~~typically~~ the limiting AOO. This event also terminates normal feedwater flow to the steam generators. (1) (2) The safety analysis demonstrates that the transient response for turbine trip occurring from full power without a direct reactor trip presents no hazard to the integrity of the RCS or the Main Steam System. One turbine trip analysis is performed assuming primary system pressure control via operation of the pressurizer relief valves and spray. This analysis demonstrates that the DNB (Departure from Nucleate Boiling) design basis is met. Another analysis is performed assuming no primary system pressure control, but crediting reactor trip on high pressurizer pressure and operation of the pressurizer safety valves. This analysis demonstrates that RCS integrity (2)

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BASES

APPLICABLE SAFETY ANALYSES (continued)

is maintained by showing that the maximum RCS pressure does not exceed 110% of the design pressure. All cases analyzed demonstrate that the MSSVs maintain Main Steam System integrity by limiting the maximum steam pressure to less than [or equal to] 110% of the steam generator design pressure. (2)

In addition to the decreased heat removal events, reactivity insertion events may also challenge the relieving capacity of the MSSVs. The [UFSAR Section 15.2.2 (Ref.7) safety analysis of the] (2) uncontrolled rod cluster control assembly (RCCA) bank withdrawal at power event is characterized by an increase in core power and steam generation rate until reactor trip occurs when ~~either~~ the Overtemperature ΔT [INSERT 1] or Power Range Neutron Flux-High setpoint is reached. (2) Steam flow to the turbine will not increase from its initial value for this event. The increased heat transfer to the secondary side causes an increase in steam pressure and may result in opening of the MSSVs prior to reactor trip, assuming no credit for operation of the atmospheric [relief] or condenser steam dump valves. The ~~FSAR Section [15.4] safety~~ analysis of the RCCA bank withdrawal [(Reference 8)] at power [slow] event ~~for a range of initial core power levels~~ demonstrates that the MSSVs are capable of preventing secondary side overpressurization for this AOO. (2) (1)

The [U]FSAR safety analyses discussed above assume that all of the MSSVs for each steam generator are OPERABLE. If there are inoperable MSSV(s), it is necessary to limit the primary system power during steady-state operation and AOOs to a value that does not result in exceeding the combined steam flow capacity of the turbine (if available) and the remaining OPERABLE MSSVs. The required limitation on primary system power necessary to prevent secondary system overpressurization may be determined by system transient analyses or conservatively arrived at by a simple heat balance calculation. In some circumstances it is necessary to limit the primary side heat generation that can be achieved during an AOO by reducing the setpoint of the Power Range Neutron Flux-High reactor trip function. ~~For example, if more than one MSSV on a single steam generator is inoperable, an uncontrolled RCCA bank withdrawal at power event occurring from a partial power level may result in an increase in reactor power that exceeds the combined steam flow capacity of the turbine and the remaining OPERABLE MSSVs. Thus, for multiple inoperable MSSVs on the same steam generator it is necessary to prevent this power increase by lowering the Power Range Neutron Flux-High setpoint to an appropriate value.~~ (3) ~~[When the Moderator Temperature Coefficient (MTC) is positive, the reactor power may increase above the initial value during~~ (1)

2 **INSERT 1**

, Overpower ΔT, High Pressurizer Pressure, High Pressurizer Water Level,

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BASES

APPLICABLE SAFETY ANALYSES (continued)

an RCS heatup event (e.g., turbine trip). Thus, for any number of inoperable MSSVs, it is necessary to reduce the trip setpoint if a positive MTC may exist at partial power conditions, unless it is demonstrated by analysis that a specified reactor power reduction alone is sufficient to prevent overpressurization of the steam system.] (1)

The MSSVs are assumed to have two active and one passive failure modes. The active failure modes are spurious opening, and failure to reclose once opened. The passive failure mode is failure to open upon demand. (4)

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

LCO

The accident analysis requires that [five] MSSVs per steam generator be OPERABLE to provide overpressure protection for design basis transients occurring at 102% RTP. The LCO requires that [five] MSSVs per steam generator be OPERABLE in compliance with Reference 2, and the DBA analysis. (1)

The OPERABILITY of the MSSVs is defined as the ability to open upon demand within the setpoint tolerances, to relieve steam generator overpressure, and reseat when pressure has been reduced. The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Program.

This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB, or Main Steam System integrity.

APPLICABILITY

In MODES 1, 2, and 3, [five] MSSVs per steam generator are required to be OPERABLE to prevent Main Steam System overpressurization. (1)

In MODES 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.

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BASES

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.

With one or more MSSVs inoperable, action must be taken so that the available MSSV relieving capacity meets Reference 2 requirements. Operation with less than all [five] MSSVs OPERABLE for each steam generator is permissible, if THERMAL POWER is limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator. 1

A.1

In the case of only a single inoperable MSSV on one or more steam generators [when the Moderator Temperature Coefficient is not positive], a reactor power reduction alone is sufficient to limit primary side heat generation such that overpressurization of the secondary side is precluded for any RCS heatup event. Furthermore, for this case there is sufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Therefore, Required Action A.1 requires an appropriate reduction in reactor power within 4 hours. 5

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for calorimetric power uncertainty.

-----------------------------------REVIEWER'S NOTE-----------------------------------
To determine the maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs, the governing heat transfer relationship is the equation $q = \dot{m}\,\Delta h$, where q is the heat input from the primary side, $\dot{m}$ is the mass flow rate of the steam, and Δh is the increase in enthalpy that occurs in converting the secondary side water to steam. If it is conservatively assumed that the secondary side water is all saturated liquid (i.e., no subcooled feedwater), then the Δh is the heat of vaporization (h_{fg}) at the steam relief pressure. The following equation is used to determine the maximum allowable power level for continued operation with inoperable MSSV(s): 6

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BASES

ACTIONS (continued)

Maximum NSSS Power ≤ (100/Q) ($w_s h_{fg}$N) / K

where:

Q = Nominal NSSS power rating of the plant (including reactor coolant pump heat), MWt

K = Conversion factor, 947.82 (Btu/sec)/MWt

w_s = Minimum total steam flow rate capability of the OPERABLE MSSVs on any one steam generator at the highest OPERABLE MSSV opening pressure, including tolerance and accumulation, as appropriate, lbm/sec.

h_{fg} = Heat of vaporization at the highest MSSV opening pressure, including tolerance and accumulation as appropriate, Btu/lbm.

N = Number of steam generators in the plant.

For use in determining the %RTP in the Required Action statement A.1, the Maximum NSSS Power calculated above is reduced by [2]% RTP to account for calorimetric power uncertainty.

6

A

B.1 and B.2

With one or more

In the case of multiple inoperable MSSVs on one or more steam generators, with a reactor power reduction alone there may be insufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. [Furthermore, for a single inoperable MSSV on one or more steam generators when the Moderator Temperature Coefficient is positive the reactor power may increase as a result of an RCS heatup event such that flow capacity of the remaining OPERABLE MSSVs is insufficient.] The 4 hour Completion Time for Required Action B.1 is consistent with A.1. An additional 32 hours is allowed in Required Action B.2 to reduce the setpoints. The Completion Time of 36 hours is based on a reasonable time to correct the MSSV inoperability, the time required to perform the power reduction, operating experience in resetting all channels of a protective function, and on the low probability of the occurrence of a transient that could result in steam generator overpressure during this period.

INSERT 2

INSERT 3

a Completion Time of 36

Power Range Neutron Flux – High reactor trip

A

5 2 5 8

5 **INSERT 2**

Required Action A.1 requires an appropriate reduction in thermal power within 4 hours. Therefore,

2 **INSERT 3**

a turbine trip without steam dump. Therefore,

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BASES

ACTIONS (continued)

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for Nuclear Instrumentation System trip channel uncertainties.

~~-----REVIEWER'S NOTE-----~~
~~To determine the Table 3.7.1-1 Maximum Allowable Power for Required Actions B.1 and B.2 (%RTP), the Maximum NSSS Power calculated using the equation in the Reviewer's Note above is reduced by [9]% RTP to account for Nuclear Instrumentation System trip channel uncertainties.~~
~~----------~~ 6

A 5

Required Action ~~B~~.2 is modified by a Note, indicating that the Power Range Neutron Flux-High reactor trip setpoint reduction is only required in MODE 1. In MODES 2 and 3 the reactor protection system trips specified in LCO 3.3.1, "Reactor Trip System Instrumentation," provide sufficient protection.

The allowed Completion Times are reasonable based on operating experience to accomplish the Required Actions in an orderly manner without challenging unit systems.

B

~~C~~.1 and ~~C~~.2 5

If the Required Actions are not completed within the associated Completion Time, or if one or more steam generators have ≥ ~~[~~4~~]~~ inoperable MSSVs, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. 1

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code (Ref. 4), requires that safety and relief valve tests be performed in accordance with ANSI/ASME OM-1-~~1987~~ (Ref. 5). 2
According to Reference 5, the following tests are required:

2001 through 2003 Addenda

a. Visual examination~~,~~ ;

7

BASES

SURVEILLANCE REQUIREMENTS (continued)

b. Seat tightness determination, ; 7

c. Setpoint pressure determination (lift setting), 7

d. Compliance with owner's seat tightness criteria, and 7

e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ± [3]% setpoint tolerance for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. The lift settings, according to Table 3.7.1-2, correspond to ambient conditions of the valve at nominal operating temperature and pressure. 1

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. U FSAR, Section [10.3.1] 10.3.2. 2 1

2. ASME, Boiler and Pressure Vessel Code, Section III, Article NC-7000, Class 2 Components dated 1968, and March 1970 Addenda. 2

3. U FSAR, Section [15.2] 15.2.7. 2 1

4. ASME Code for Operation and Maintenance of Nuclear Power Plants.

5. ANSI/ASME OM-1-1987 2001 through 2003 Addenda. 2

6. NRC Information Notice 94-60, "Potential Overpressurization of the Main Steam System," August 22, 1994.

7. UFSAR, Section 15.2.2 2

8. AREVA Document 51-5006459-00, "SQN Uncontrolled RCCA Withdrawal Accident Analysis Profile". 2

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

BASES

BACKGROUND

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing ~~a heat sink~~ for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available. (2)

~~[~~Five~~]~~ MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in ~~the~~ U FSAR, Section ~~[10.3.1]~~ 10.3.2 (Ref. 1). The MSSVs must have sufficient capacity to limit the secondary system pressure to ≤ 110% of the steam generator design pressure in order to meet the requirements of the ASME Code, Section III (Ref. 2). The MSSV design includes staggered setpoints, according to Table 3.7.1-2 in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves following a turbine reactor trip. (1) (2)

APPLICABLE SAFETY ANALYSES

The design basis for the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure for any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and transient analysis.

The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in ~~the~~ U FSAR, Section ~~[15.2]~~ 15.2.7 (Ref. 3). Of these, the full power turbine trip without steam dump is ~~typically~~ the limiting AOO. This event also terminates normal feedwater flow to the steam generators. (1) (2)

The safety analysis demonstrates that the transient response for turbine trip occurring from full power without a direct reactor trip presents no hazard to the integrity of the RCS or the Main Steam System. One turbine trip analysis is performed assuming primary system pressure control via operation of the pressurizer relief valves and spray. This analysis demonstrates that the DNB (Departure from Nucleate Boiling) design basis is met. Another analysis is performed assuming no primary system pressure control, but crediting reactor trip on high pressurizer pressure and operation of the pressurizer safety valves. This analysis demonstrates that RCS integrity (2)

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BASES

APPLICABLE SAFETY ANALYSES (continued)

is maintained by showing that the maximum RCS pressure does not exceed 110% of the design pressure. All cases analyzed demonstrate that the MSSVs maintain Main Steam System integrity by limiting the maximum steam pressure to less than [or equal to] 110% of the steam generator design pressure. (2)

In addition to the decreased heat removal events, reactivity insertion events may also challenge the relieving capacity of the MSSVs. The [UFSAR Section 15.2.2 (Ref.7) safety analysis of the] (2) uncontrolled rod cluster control assembly (RCCA) bank withdrawal at power event is characterized by an increase in core power and steam generation rate until reactor trip occurs when ~~either~~ the Overtemperature ΔT [INSERT 1] or Power Range Neutron Flux-High setpoint is reached. (2) Steam flow to the turbine will not increase from its initial value for this event. The increased heat transfer to the secondary side causes an increase in steam pressure and may result in opening of the MSSVs prior to reactor trip, assuming no credit for operation of the atmospheric [relief] or condenser steam dump valves. The ~~FSAR Section [15.4] safety~~ analysis of the RCCA bank withdrawal [(Reference 8)] at power [slow] event ~~for a range of initial core power levels~~ demonstrates that the MSSVs are capable of preventing secondary side overpressurization for this AOO. (2) (1)

The [U]FSAR safety analyses discussed above assume that all of the MSSVs for each steam generator are OPERABLE. If there are inoperable MSSV(s), it is necessary to limit the primary system power during steady-state operation and AOOs to a value that does not result in exceeding the combined steam flow capacity of the turbine (if available) and the remaining OPERABLE MSSVs. The required limitation on primary system power necessary to prevent secondary system overpressurization may be determined by system transient analyses or conservatively arrived at by a simple heat balance calculation. In some circumstances it is necessary to limit the primary side heat generation that can be achieved during an AOO by reducing the setpoint of the Power Range Neutron Flux-High reactor trip function. ~~For example, if more than one MSSV on a single steam generator is inoperable, an uncontrolled RCCA bank withdrawal at power event occurring from a partial power level may result in an increase in reactor power that exceeds the combined steam flow capacity of the turbine and the remaining OPERABLE MSSVs. Thus, for multiple inoperable MSSVs on the same steam generator it is necessary to prevent this power increase by lowering the Power Range Neutron Flux-High setpoint to an appropriate value.~~ (3) ~~[When the Moderator Temperature Coefficient (MTC) is positive, the reactor power may increase above the initial value during~~ (1)

2 **INSERT 1**

, Overpower ΔT, High Pressurizer Pressure, High Pressurizer Water Level,

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BASES

APPLICABLE SAFETY ANALYSES (continued)

~~an RCS heatup event (e.g., turbine trip). Thus, for any number of inoperable MSSVs, it is necessary to reduce the trip setpoint if a positive MTC may exist at partial power conditions, unless it is demonstrated by analysis that a specified reactor power reduction alone is sufficient to prevent overpressurization of the steam system.]~~ 1

~~The MSSVs are assumed to have two active and one passive failure modes. The active failure modes are spurious opening, and failure to reclose once opened. The passive failure mode is failure to open upon demand.~~ 4

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

LCO

The accident analysis requires that ~~[~~five~~]~~ MSSVs per steam generator be OPERABLE to provide overpressure protection for design basis transients occurring at 102% RTP. The LCO requires that ~~[~~five~~]~~ MSSVs per steam generator be OPERABLE in compliance with Reference 2, and the DBA analysis. 1

The OPERABILITY of the MSSVs is defined as the ability to open upon demand within the setpoint tolerances, to relieve steam generator overpressure, and reseat when pressure has been reduced. The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Program.

This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB, or Main Steam System integrity.

APPLICABILITY

In MODES 1, 2, and 3, ~~[~~five~~]~~ MSSVs per steam generator are required to be OPERABLE to prevent Main Steam System overpressurization. 1

In MODES 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.

BASES

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.

With one or more MSSVs inoperable, action must be taken so that the available MSSV relieving capacity meets Reference 2 requirements. Operation with less than all [five] MSSVs OPERABLE for each steam generator is permissible, if THERMAL POWER is limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator. 1

A.1

In the case of only a single inoperable MSSV on one or more steam generators [when the Moderator Temperature Coefficient is not positive], a reactor power reduction alone is sufficient to limit primary side heat generation such that overpressurization of the secondary side is precluded for any RCS heatup event. Furthermore, for this case there is sufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Therefore, Required Action A.1 requires an appropriate reduction in reactor power within 4 hours. 5

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for calorimetric power uncertainty.

-----------------------------------REVIEWER'S NOTE-----------------------------------
To determine the maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs, the governing heat transfer relationship is the equation $q = \dot{m}\,\Delta h$, where q is the heat input from the primary side, $\dot{m}$ is the mass flow rate of the steam, and Δh is the increase in enthalpy that occurs in converting the secondary side water to steam. If it is conservatively assumed that the secondary side water is all saturated liquid (i.e., no subcooled feedwater), then the Δh is the heat of vaporization (h_{fg}) at the steam relief pressure. The following equation is used to determine the maximum allowable power level for continued operation with inoperable MSSV(s): 6

BASES

ACTIONS (continued)

~~Maximum NSSS Power ≤ (100/Q) ($w_s h_{fg}$N) / K~~

~~where:~~

~~Q = Nominal NSSS power rating of the plant (including reactor coolant pump heat), MWt~~

~~K = Conversion factor, 947.82 (Btu/sec)/MWt~~

~~w_s = Minimum total steam flow rate capability of the OPERABLE MSSVs on any one steam generator at the highest OPERABLE MSSV opening pressure, including tolerance and accumulation, as appropriate, lbm/sec.~~

~~h_{fg} = Heat of vaporization at the highest MSSV opening pressure, including tolerance and accumulation as appropriate, Btu/lbm.~~

~~N = Number of steam generators in the plant.~~

~~For use in determining the %RTP in the Required Action statement A.1, the Maximum NSSS Power calculated above is reduced by [2]% RTP to account for calorimetric power uncertainty.~~ 6

A

~~B~~.1 and ~~B~~.2

With one or more

~~In the case of multiple~~ inoperable MSSVs on one or more steam generators, with a reactor power reduction alone there may be insufficient total steam flow capacity provided by the ~~turbine and~~ remaining OPERABLE MSSVs to preclude overpressurization in the event of ~~an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power~~. ~~[Furthermore, for a single inoperable MSSV on one or more steam generators when the Moderator Temperature Coefficient is positive the reactor power may increase as a result of an RCS heatup event such that flow capacity of the remaining OPERABLE MSSVs is insufficient.] The 4 hour Completion Time for Required Action B.1 is consistent with A.1. An additional~~ ~~3~~~~2~~ hours is allowed in Required Action ~~B~~.2 to reduce the setpoints. The Completion Time of 36 hours is based on a reasonable time to correct the MSSV inoperability, the time required to perform the power reduction, operating experience in resetting all channels of a protective function, and on the low probability of the occurrence of a transient that could result in steam generator overpressure during this period.

INSERT 2

INSERT 3

a Completion Time of 36

Power Range Neutron Flux – High reactor trip

A

5 2 5 8

5 **INSERT 2**

Required Action A.1 requires an appropriate reduction in thermal power within 4 hours. Therefore,

2 **INSERT 3**

a turbine trip without steam dump. Therefore,

BASES

ACTIONS (continued)

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for Nuclear Instrumentation System trip channel uncertainties.

~~-----REVIEWER'S NOTE-----~~
~~To determine the Table 3.7.1-1 Maximum Allowable Power for Required Actions B.1 and B.2 (%RTP), the Maximum NSSS Power calculated using the equation in the Reviewer's Note above is reduced by [9]% RTP to account for Nuclear Instrumentation System trip channel uncertainties.~~
~~-----~~ 6

A 5

Required Action ~~B~~.2 is modified by a Note, indicating that the Power Range Neutron Flux-High reactor trip setpoint reduction is only required in MODE 1. In MODES 2 and 3 the reactor protection system trips specified in LCO 3.3.1, "Reactor Trip System Instrumentation," provide sufficient protection.

The allowed Completion Times are reasonable based on operating experience to accomplish the Required Actions in an orderly manner without challenging unit systems.

B

~~C~~.1 and ~~C~~.2 5

If the Required Actions are not completed within the associated Completion Time, or if one or more steam generators have ≥ ~~[~~4~~]~~ inoperable MSSVs, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. 1

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code (Ref. 4), requires that safety and relief valve tests be performed in accordance with ANSI/ASME OM-1-~~1987~~ (Ref. 5). 2
According to Reference 5, the following tests are required:

2001 through 2003 Addenda

a. Visual examination~~,~~ ; 7

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BASES

SURVEILLANCE REQUIREMENTS (continued)

b. Seat tightness determination, ; 7

c. Setpoint pressure determination (lift setting), 7

d. Compliance with owner's seat tightness criteria, and 7

e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ± [3]% setpoint tolerance for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. The lift settings, according to Table 3.7.1-2, correspond to ambient conditions of the valve at nominal operating temperature and pressure. 1

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. U FSAR, Section [10.3.1] 10.3.2. 2 1

2. ASME, Boiler and Pressure Vessel Code, Section III, Article NC-7000, Class 2 Components dated 1968, and March 1970 Addenda. 2

3. U FSAR, Section [15.2] 15.2.7. 2 1

4. ASME Code for Operation and Maintenance of Nuclear Power Plants.

5. ANSI/ASME OM-1-1987 2001 through 2003 Addenda. 2

6. NRC Information Notice 94-60, "Potential Overpressurization of the Main Steam System," August 22, 1994.

7. UFSAR, Section 15.2.2 2

8. AREVA Document 51-5006459-00, "SQN Uncontrolled RCCA Withdrawal Accident Analysis Profile". 2

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.1 BASES, MAIN STEAM SAFETY VALVES (MSSVs)

1. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

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

3. This redundant example has been deleted.

4. The discussion of the active and passive failure modes of the MSSVs has been deleted, because it does not add information on how the MSSVs mitigate transients that is normally included in the Applicable Safety Analyses section.

5. Changes have been made to be consistent with changes made to the Specification.

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

7. The punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

8. Editorial changes made for consistency with Specification.

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.7.1, MAIN STEAM SAFETY VALVES (MSSVS)

There are no specific No Significant Hazards Considerations for this Specification.

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ATTACHMENT 2

ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

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

ITS (A01) ITS 3.7.2

PLANT SYSTEMS

MAIN STEAM LINE ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

LCO 3.7.2 — 3.7.1.5 Four main steam line isolation valves shall be OPERABLE.

Applicability — APPLICABILITY: MODES 1, 2 and 3 [, except when all MSIVs are closed] (L01)

ACTION:

ACTION A — MODE 1 - With one main steam line isolation valve inoperable, POWER OPERATION may continue provided the inoperable valve is restored to OPERABLE status within 4 hours;

ACTION B — Otherwise, be in MODE 2 within the next 6 hours.

ACTION C — MODES 2 - and 3 With one or more main steam line isolation valves inoperable, subsequent operation in MODES 2 or 3 may proceed provided:

ACTION C — a. The isolation valve is ~~restored to OPERABLE status or~~ closed within 4 hours; (A02)

ACTION C — b. The inoperable isolation valve is verified closed once per 7 days;

ACTION C Note — c. Separate entry into this action is allowed for each isolation valve.

ACTION D — Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

[Add proposed SR 3.7.2.1 Note] (L02)

SR 3.7.2.1 — 4.7.1.5.1 Each main steam line isolation valve shall be demonstrated OPERABLE by verifying full closure within limits when tested ~~pursuant to Specification 4.0.5~~ [in accordance with the Inservice Testing Program]. (A03)

SR 3.7.2.2 — 4.7.1.5.2 ~~At least once per 18 months,~~ verify each main steam isolation valve closes on an actual or simulated automatic actuation signal [In accordance with the Surveillance Frequency Control Program]. (LA01)

[Add proposed SR 3.7.2.2 Note] (L02)

ITS

A01

ITS 3.7.2

PLANT SYSTEMS

MAIN STEAM LINE ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

LCO 3.7.2 3.7.1.5 Four main steam line isolation valves shall be OPERABLE.

Applicability APPLICABILITY: MODE 1, 2, and 3. [, except when all MSIVs are closed] L01

ACTION:

ACTION A MODE 1 - With one main steam line isolation valve inoperable, POWER OPERATION may continue provided the inoperable valve is restored to OPERABLE status within 4 hours;

ACTION B Otherwise, be in MODE 2 within the next 6 hours.

ACTION C MODES 2 - and 3 With one or more main steam line isolation valves inoperable, subsequent operation in MODES 2 or 3 may proceed provided:

ACTION C a. The isolation valve is ~~restored to OPERABLE status or~~ closed within 4 hours; A02

ACTION C b. The inoperable isolation valve is verified closed once per 7 days;

ACTION C Note c. Separate entry into this action is allowed for each isolation valve.

ACTION D Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

[Add proposed SR 3.7.2.1 Note] L02

SR 3.7.2.1 4.7.1.5.1 Each main steam line isolation valve shall be demonstrated OPERABLE by verifying full closure within limits when tested ~~pursuant to Specification 4.0.5~~ [in accordance with the Inservice Testing Program]. A03

SR 3.7.2.2 4.7.1.5.2 ~~At least once per 18 months,~~ [In accordance with the Surveillance Frequency Control Program] verify each main steam isolation valve closes on an actual or simulated automatic actuation signal. LA01

[Add proposed SR 3.7.2.2 Note] L02

DISCUSSION OF CHANGES
ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.7.1.5 ACTION MODES 2 and 3 states, in part, that with one or more MSIVs inoperable, operation in MODE 2 or 3 may continue provided the MSIV is restored to OPERABLE status or closed within 4 hours. ITS 3.7.2 Required Action C.1 does not contain the statement to restore the inoperable MSIV to OPERABLE status. This changes the CTS by not including the statement to restore the inoperable MSIV to OPERABLE status.

This change is acceptable, because the technical requirements have not changed. Restoration to compliance with the LCO is always an available Required Action and it is the convention in the ITS to not state such "restore" options explicitly, unless it is the only action or is required for clarity. This change is designated as administrative, because it does not result in technical changes to the CTS.

A03 CTS 4.7.1.5.1 requires each main steam line isolation valve to be demonstrated OPERABLE by verifying full closure within limits when tested pursuant to Specification 4.0.5. ITS SR 3.7.2.1 requires verifying the isolation time of each main steam isolation valve is within limits, with a Frequency stated as 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 4.7.1.5.1 is to verify the isolation time of each main steam isolation valve is within limits when tested in accordance with Specification 4.0.5. The Inservice Testing Program portion of CTS Specification 4.0.5 provides the requirements for the Inservice Testing Program that are essentially identical to ITS 5.5.8, Inservice Testing Program. This change is acceptable because the Frequencies regarding the main steam isolation valve testing remain the same. The inservice testing requirements of CTS 4.0.5 have been moved 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 a technical change to the CTS.

MORE RESTRICTIVE CHANGES

None

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DISCUSSION OF CHANGES
ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.7.1.5.2 requires verification that each MSIV closes on an actual or simulated automatic actuation signal at least once per 18 months. ITS SR 3.7.2.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequency for this SR and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequency is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS 3.7.1.5 is applicable in MODES 1, 2, and 3. ITS LCO 3.7.2 is applicable in MODE 1, and in MODES 2 and 3 except when all MSIVs are closed. This changes the CTS by making the Specification not applicable in MODES 2 and 3 when all MSIVs are closed.

The purpose of the ITS 3.7.2 Applicability exception is to clarify that the MSIVs are not required to be OPERABLE when they are in a position that supports the safety analyses. This change is acceptable, because the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses. When the valves are in the closed position, they are in their assumed accident position. This change is designated as less restrictive, because the ITS LCO requirements are applicable in fewer operating conditions than in the CTS.

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DISCUSSION OF CHANGES
ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

L02 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.7.1.5.1 requires the closure time of each main steam isolation valve to be verified to be within limits when tested pursuant to Specification 4.0.5. CTS 4.7.1.5.2 requires verification that the main steam isolation valves close on an actual or simulated automatic actuation signal. ITS SR 3.7.2.1 and SR 3.7.2.2 require similar tests. However, a Note modifies each SR, stating the SR is only required to be performed in MODES 1 and 2. This changes the CTS by allowing entry into MODE 3 without performing the Surveillance Requirements.

The purpose of CTS 4.7.1.5.1 is to demonstrate that the closure time of each MSIV is within the limits assumed in the containment and accident analyses. The purpose of CTS 4.7.1.5.2 is to demonstrate that each MSIV closes on an actual or simulated actuation signal consistent with the assumptions of the accident analyses. These tests are normally conducted in MODE 3 with the unit at operating temperature and pressure. Addition of the Notes modifying the Surveillance Requirements allows a delay in testing until plant temperature and pressure conditions are established consistent with the conditions that the acceptance criterion are based. This change is designated as less restrictive because the ITS Surveillance Requirement is required to be performed in fewer operating conditions than in the CTS.

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

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

3.7.1.5 LCO 3.7.2 [Four] MSIVs shall be OPERABLE. (2)

Applicability
DOC L01 APPLICABILITY: MODE 1,
MODES 2 and 3 except when all MSIVs are closed ~~[and de-activated]~~. (2)

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION – MODE 1	A. One MSIV inoperable in MODE 1.	A.1 Restore MSIV to OPERABLE status.	~~[8]~~ 4 hours	(2)
ACTION – MODE 1	B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours	
ACTION – MODES 2 and 3, c. ACTION – MODES 2 and 3, a. and b.	C. ------------NOTE------------ Separate Condition entry is allowed for each MSIV. --------------------------------- One or more MSIVs inoperable in MODE 2 or 3.	C.1 Close MSIV. AND C.2 Verify MSIV is closed.	~~[8]~~ 4 hours Once per 7 days	(2)
ACTION – MODES 2 and 3	D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours	

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
DOC L02 4.7.1.5.1	SR 3.7.2.1	-------------------------------NOTE------------------------------ Only required to be performed in MODES 1 and 2. --- Verify the isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program	
DOC L02 4.7.1.5.2	SR 3.7.2.2	-------------------------------NOTE------------------------------ Only required to be performed in MODES 1 and 2. --- Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 3

CTS

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

3.7.1.5 LCO 3.7.2 [Four] MSIVs shall be OPERABLE. 2

Applicability
DOC L01

APPLICABILITY: MODE 1,
MODES 2 and 3 except when all MSIVs are closed [and de-activated]. 2

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION – MODE 1	A. One MSIV inoperable in MODE 1.	A.1 Restore MSIV to OPERABLE status.	[8] hours 4	2
ACTION – MODE 1	B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours	
ACTION – MODES 2 and 3, c.	C. ------------NOTE------------ Separate Condition entry is allowed for each MSIV. ---------------------------------	C.1 Close MSIV.	[8] hours 4	2
		AND		
ACTION – MODES 2 and 3, a. and b.	One or more MSIVs inoperable in MODE 2 or 3.	C.2 Verify MSIV is closed.	Once per 7 days	
ACTION – MODES 2 and 3	D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	6 hours	
		AND		
		D.2 Be in MODE 4.	12 hours	

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CTS

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
DOC L02	SR 3.7.2.1	-----------------------------NOTE----------------------------- Only required to be performed in MODES 1 and 2. --		
4.7.1.5.1		Verify the isolation time of each MSIV is within limits.	In accordance with the Inservice Testing Program	
DOC L02	SR 3.7.2.2	-----------------------------NOTE----------------------------- Only required to be performed in MODES 1 and 2. --		
4.7.1.5.2		Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	~~[[18] months~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 3

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JUSTIFICATION FOR DEVIATIONS
ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

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. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. ISTS SR 3.7.2.2 provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Therefore, the Frequency for ITS SR 3.7.2.2 is "In accordance with the Surveillance Frequency Control Program."

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

B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Isolation Valves (MSIVs)

BASES

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSIV closure terminates flow from the unaffected (intact) steam generators.

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. Closing the MSIVs isolates each steam generator from the others, and isolates the turbine, Steam ~~Bypass~~ Dump System, and other auxiliary steam supplies from the steam generators. (1)

The MSIVs close on a main steam isolation signal generated by either low steam ~~generator~~ line pressure ~~or~~, high - high containment pressure, or high steam pressure rate. The MSIVs fail closed on loss of control ~~or actuation power~~ power or control air. (1)

Each MSIV has an MSIV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSIVs. The MSIVs may also be actuated manually.

A description of the MSIVs is found in the U FSAR, Section [10.3] (Ref. 1). (1) (2)

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment analysis for the large steam line break (SLB) inside containment, discussed in the U FSAR, Section [6.2] (Ref. 2). It is also affected by the accident analysis of the SLB events presented in the U FSAR, Section ~~[15.1.5]~~ 15.4.2 (Ref. 3). The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand). (1) (2) (1)

The limiting case for the containment analysis is the SLB inside containment, with a loss of offsite power following turbine trip, and failure of the MSIV on the affected steam generator to close. At lower powers, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. Due to reverse flow and failure of the MSIV to close, the additional mass and energy in the steam headers downstream from the other MSIVs contribute to the total release. With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System. (3)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The accident analysis compares several different SLB events against different acceptance criteria. The large SLB outside containment upstream of the MSIV is limiting for offsite dose, although a break in this short section of main steam header has a very low probability. The large SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System (RCS) cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close. 4

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. An HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes that the MSIV ~~in~~ for the affected steam generator remains open. For this accident scenario, steam is discharged into containment from all steam generators until the remaining MSIVs close. After MSIV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSIVs in the unaffected loops. Closure of the MSIVs isolates the break from the unaffected steam generators. 3

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the MSIVs isolates the break and limits the blowdown to a single steam generator.

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs.

d. Following a steam generator tube rupture, closure of the MSIVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases.

e. The MSIVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSIV OPERABILITY is concerned.

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

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BASES

LCO

This LCO requires that [four] MSIVs in the steam lines be OPERABLE. The MSIVs are considered OPERABLE when the isolation times are within limits, and they close on an isolation actuation signal. 2

This LCO provides assurance that the MSIVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis.

APPLICABILITY

The MSIVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed and de-activated, when there is significant mass and energy in the RCS and steam generators. When the MSIVs are closed, they are already performing the safety function. 5

In MODE 4, normally most of the MSIVs are closed, and the steam generator energy is low.

In MODE 4, 5 or 6, the steam generators do not contain much energy is low because their temperature is below the boiling point of water; therefore, the MSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES. 5

ACTIONS

A.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within [8] 4 hours. Some repairs to the MSIV can be made with the unit hot. The [8] 4 hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs. 2

The [8] hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional means for containment isolation. 1

B.1

If the MSIV cannot be restored to OPERABLE status within [8] 4 hours, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 2 within 6 hours and Condition C would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSIVs in an orderly manner and without challenging unit systems. 2

BASES

ACTIONS (continued)

C.1 and C.2

Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSIV.

Since the MSIVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIVs may either be restored to OPERABLE status or closed. When closed, the MSIVs are already in the position required by the assumptions in the safety analysis.

4

The ~~[8]~~ hour Completion Time is consistent with that allowed in Condition A. 2

For inoperable MSIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

D.1 and D.2

If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

5 seconds. The MSIV isolation time is within the limit

This SR verifies that the closure time of each MSIV is within ~~the limit given in Reference 5 and is within that~~ assumed in the accident and containment analyses. This SR also verifies the valve closure time is in accordance with the Inservice Testing Program. This SR is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSIVs are not tested at power, they are exempt from the ASME Code (Ref. ~~6~~), requirements during operation in MODE 1 or 2. 6

5

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is in accordance with the Inservice Testing Program.

This test is conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage. ~~[The Frequency of MSIV testing is every [18] months. The [18] month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.~~ 7

~~OR~~

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

INSERT 1 8

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~-----]~~ 9

REFERENCES

1. U FSAR, Section ~~[~~10.3~~]~~. 1
2. FSAR, Section ~~[~~6.2~~]~~. 2
3. FSAR, Section ~~[15.1.5]~~ 15.4.2.
4. 10 CFR 100.11.
5. ~~5. [Technical Requirements Manual.]~~ 6
6. 5 ~~6~~. ASME Code for Operation and Maintenance of Nuclear Power Plants.

8 **INSERT 1**

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3.

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B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Isolation Valves (MSIVs)

BASES

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSIV closure terminates flow from the unaffected (intact) steam generators.

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. Closing the MSIVs isolates each steam generator from the others, and isolates the turbine, Steam ~~Bypass~~ Dump System, and other auxiliary steam supplies from the steam generators. 1

The MSIVs close on a main steam isolation signal generated by either low steam ~~generator~~ line pressure ~~or~~ , high - high containment pressure, or high steam pressure rate. The MSIVs fail closed on loss of control ~~or actuation power~~ power or control air. 1

Each MSIV has an MSIV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSIVs. The MSIVs may also be actuated manually.

A description of the MSIVs is found in the UFSAR, Section [10.3] (Ref. 1). 1 2

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment analysis for the large steam line break (SLB) inside containment, discussed in the UFSAR, Section [6.2] (Ref. 2). It is also affected by the accident analysis of the SLB events presented in the UFSAR, Section ~~[15.1.5]~~ 15.4.2 (Ref. 3). The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand). 1 2 1

The limiting case for the containment analysis is the SLB inside containment, with a loss of offsite power following turbine trip, and failure of the MSIV on the affected steam generator to close. At lower powers, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. Due to reverse flow and failure of the MSIV to close, the additional mass and energy in the steam headers downstream from the other MSIVs contribute to the total release. With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System. 3

BASES

APPLICABLE SAFETY ANALYSES (continued)

The accident analysis compares several different SLB events against different acceptance criteria. The large SLB outside containment upstream of the MSIV is limiting for offsite dose, although a break in this short section of main steam header has a very low probability. The large SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System (RCS) cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close. 4

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. An HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes that the MSIV ~~in~~ for the affected steam generator remains open. For this accident scenario, steam is discharged into containment from all steam generators until the remaining MSIVs close. After MSIV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSIVs in the unaffected loops. Closure of the MSIVs isolates the break from the unaffected steam generators. 3

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the MSIVs isolates the break and limits the blowdown to a single steam generator.

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs.

d. Following a steam generator tube rupture, closure of the MSIVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases.

e. The MSIVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSIV OPERABILITY is concerned.

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

BASES

LCO

This LCO requires that [four] MSIVs in the steam lines be OPERABLE. The MSIVs are considered OPERABLE when the isolation times are within limits, and they close on an isolation actuation signal. 2

This LCO provides assurance that the MSIVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis.

APPLICABILITY

The MSIVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed and de-activated, when there is significant mass and energy in the RCS and steam generators. When the MSIVs are closed, they are already performing the safety function. 5

In MODE 4, normally most of the MSIVs are closed, and the steam generator energy is low.

In MODE 4, 5 or 6, the steam generators do not contain much energy is low because their temperature is below the boiling point of water; therefore, the MSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES. 5

ACTIONS

A.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within 4 [8] hours. Some repairs to the MSIV can be made with the unit hot. The 4 [8] hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs. 2

The [8] hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional means for containment isolation. 1

B.1

If the MSIV cannot be restored to OPERABLE status within 4 [8] hours, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 2 within 6 hours and Condition C would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSIVs in an orderly manner and without challenging unit systems. 2

BASES

ACTIONS (continued)

C.1 and C.2

Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSIV.

Since the MSIVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIVs may either be restored to OPERABLE status or closed. When closed, the MSIVs are already in the position required by the assumptions in the safety analysis.

4

The ~~[8]~~ hour Completion Time is consistent with that allowed in Condition A. 2

For inoperable MSIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

D.1 and D.2

If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

5 seconds. The MSIV isolation time is within the limit

This SR verifies that the closure time of each MSIV is within ~~the limit given in Reference 5 and is within that~~ assumed in the accident and containment analyses. This SR also verifies the valve closure time is in accordance with the Inservice Testing Program. This SR is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSIVs are not tested at power, they are exempt from the ASME Code (Ref. ~~6~~), requirements during operation in MODE 1 or 2. 6

5

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency is in accordance with the Inservice Testing Program.

This test is conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

SR 3.7.2.2

This SR verifies that each MSIV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage. [The Frequency of MSIV testing is every [18] months. The [18] month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint. (7)

OR

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

INSERT 1 (8)

-----REVIEWER'S NOTE-----
Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.
-----] (9)

REFERENCES

U

1. FSAR, Section [10.3]. (1) (2)
2. FSAR, Section [6.2].
3. FSAR, Section [15.1.5]. 15.4.2
4. 10 CFR 100.11.
5. [Technical Requirements Manual.] (6)
5 6. ASME Code for Operation and Maintenance of Nuclear Power Plants.

8

INSERT 1

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3.

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JUSTIFICATION FOR DEVIATIONS
ITS 3.7.2 BASES, MAIN STEAM ISOLATION VALVES (MSIVs)

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

2. The ISTS Bases contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

3. Editorial/grammatical changes made for enhanced clarity.

4. Changes made consistent with TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications."

5. Changes are made to be consistent with changes made to the Specification.

6. In License Amendment 324/316, approved June 12, 2009 (ML090930330), the MSIV closure time limit was relocated from the Technical Specifications to the TS Bases. Therefore, ISTS 3.7.2 Bases are changed to reflect the inclusion of the MSIV closure time limit. Furthermore, since Reference 5 is not needed the subsequent References have been renumbered.

7. ISTS SR 3.7.2.2 Bases provides two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies under the Surveillance Frequency Control Program. Additionally, the Frequency description which is being removed will be included in the Surveillance Frequency Control Program.

8. Changes are made to be consistent with the Specification.

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

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Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.7.2, MAIN STEAM ISOLATION VALVES (MSIVs)

There are no specific No Significant Hazards Considerations for this Specification.

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ATTACHMENT 3

ITS 3.7.3, MAIN FEEDWATER ISOLATION VALVES (MFIVs), MAIN FEEDWATER REGULATING VALVES (MFRVs) AND MFRV BYPASS VALVES

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

ITS — A01 — ITS 3.7.3

PLANT SYSTEMS

MAIN FEEDWATER ISOLATION, REGULATING, AND BYPASS VALVES

LIMITING CONDITION FOR OPERATION

LCO 3.7.3 — 3.7.1.6 Four main feedwater isolation valves (MFIVs), four main feedwater regulating valves (MFRVs), and four MFRV bypass valves shall be OPERABLE.

Applicability — APPLICABILITY: MODES 1, 2, and 3 [inserted: except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve] (L01)

ACTION:

ACTION A / ACTION E — a. With one or more MFIVs inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. (A02)

ACTION B / ACTION E — b. With one or more MFRVs inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. (A02)

ACTION C / ACTION E — c. With one or more MFRV bypass valves inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. (A02)

Required Actions A.2, B.2, C.2 — d. For each MFIV, MFRV, or MFRV bypass valve that has been closed or isolated to satisfy Action a., b., or c. above, verify that it is closed or isolated once per 7 days.

ACTION D / ACTION E — e. With two valves in the same main feedwater flow path inoperable, isolate the affected flow path within 8 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTIONS NOTE — f. Separate entry into the above ACTIONS is allowed for each valve or flow path.

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 / SR 3.7.3.2 — 4.7.1.6 [Add proposed SR 3.7.3.1.] ~~In addition to the requirements of Specification 4.0.5~~, verify each MFIV, MFRV, and MFRV bypass valve closes on an actual or simulated automatic actuation signal ~~at least once per 18 months~~ [inserted: In accordance with the Surveillance Frequency Control Program] (LA01). (A03)

PLANT SYSTEMS

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

LIMITING CONDITION FOR OPERATION

3.7.2 This specification has been deleted.

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ITS

A01

ITS 3.7.3

PLANT SYSTEMS

MAIN FEEDWATER ISOLATION, REGULATING, AND BYPASS VALVES

LIMITING CONDITION FOR OPERATION

LCO 3.7.3 — 3.7.1.6 Four main feedwater isolation valves (MFIVs), four main feedwater regulating valves (MFRVs), and four MFRV bypass valves shall be OPERABLE.

Applicability — APPLICABILITY: MODES 1, 2, and 3 [except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve] L01

ACTION:

ACTION A / ACTION E — a. With one or more MFIVs inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. A02

ACTION B / ACTION E — b. With one or more MFRVs inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. A02

ACTION C / ACTION E — c. With one or more MFRV bypass valves inoperable, POWER OPERATION may continue provided the inoperable valve is ~~returned to OPERABLE status or~~ closed or isolated within 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. A02

Required Actions A.2, B.2, C.2 — d. For each MFIV, MFRV, or MFRV bypass valve that has been closed or isolated to satisfy Action a., b., or c. above, verify that it is closed or isolated once per 7 days.

ACTION D / ACTION E — e. With two valves in the same main feedwater flow path inoperable, isolate the affected flow path within 8 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTIONS NOTE — f. Separate entry into the above ACTIONS is allowed for each valve or flow path.

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1 / SR 3.7.3.2 — 4.7.1.6 [Add proposed SR 3.7.3.1.] ~~In addition to the requirements of Specification 4.0.5~~, verify each MFIV, MFRV, and MFRV bypass valve closes on an actual or simulated automatic actuation signal [In accordance with the Surveillance Frequency Control Program] ~~at least once per 18 months~~. A03 LA01

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PLANT SYSTEMS

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

LIMITING CONDITION FOR OPERATION

3.7.2 This specification has been deleted.

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DISCUSSION OF CHANGES
ITS 3.7.3, MAIN FEEDWATER ISOLATION VALVES (MFIVS), MAIN FEEDWATER REGULATING VALVES (MFRVS) AND MFRV BYPASS VALVES

ADMINISTRATIVE CHANGES

A01 In the conversion of the Sequoyah Nuclear Plant (SQN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 4.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS) and additional Technical Specification Task Force (TSTF) travelers included in this submittal.

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

A02 CTS 3.7.1.6 ACTION a states, in part, to either restore an inoperable MFIV to OPERABLE status, or close or isolate the valve within 72 hours. CTS 3.7.1.6 ACTION b states, in part, to either restore an inoperable MFRV to OPERABLE status, or close or isolate the valve within 72 hours. CTS 3.7.1.6 ACTION c states, in part, to either restore an inoperable MFRV bypass valve to OPERABLE status, or close or isolate the valve within 72 hours. ITS 3.7.3 ACTIONS A, B and C do not contain the statement to restore an inoperable MFIV, MFRV, or MFRV bypass valve to OPERABLE status. This changes the CTS by not including the statement to restore an inoperable MFIV, MFRV, or MFRV bypass valve to OPERABLE status.

This change is acceptable because the technical requirements have not changed. Restoration to compliance with the LCO is always an available Required Action and it is the convention in the ITS to not state such "restore" options explicitly unless it is the only action or is required for clarity. This change is designated as administrative because it does not result in technical changes to the CTS.

A03 CTS 4.7.1.6 requires, in part, that each MFIV, MFRV, and MFRV bypass valve is tested pursuant to Specification 4.0.5 (i.e., isolation time). ITS SR 3.7.3.1 requires verification that the isolation time of each MFIV, MFRV, and MFRV bypass valve is within limits with a Frequency of in accordance with the Inservice Testing Program. This changes the CTS by specifying the Specification 4.0.5 required testing is an isolation time test of each MFIV, MFRV, and MFRV bypass valve, and that the testing Frequency is in accordance with the Inservice Testing Program.

The purpose of CTS 4.7.1.6 is to verify each MFIV, MFRV, and MFRV bypass valve is tested in accordance with Specification 4.0.5, which provides the isolation time testing requirements in accordance with the Inservice Testing Program. This change is acceptable, because the valve isolation time testing requirements and testing Frequencies for the MFIV, MFRV, and MFRV bypass valves remain unchanged. The inservice testing requirements of CTS 4.0.5 have been moved 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 a technical change to the CTS.

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DISCUSSION OF CHANGES
ITS 3.7.3, MAIN FEEDWATER ISOLATION VALVES (MFIVS), MAIN FEEDWATER REGULATING VALVES (MFRVS) AND MFRV BYPASS VALVES

MORE RESTRICTIVE CHANGES

None

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.7.1.6 requires verifying that each MFIV, MFRV, and MFRV bypass valve closes on an actual or simulated automatic signal at least once per 18 months. ITS SR 3.7.3.2 requires a similar Surveillance and specifies the periodic Frequency as, "In accordance with the Surveillance Frequency Control Program." This changes the CTS by moving the specified Frequency for this SR and associated Bases to the Surveillance Frequency Control Program.

The removal of these details related to Surveillance Requirement Frequencies from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The existing Surveillance Frequencies are removed from Technical Specifications and placed under licensee control pursuant to the methodology described in NEI 04-10. A new program (Surveillance Frequency Control Program) is being added to the Administrative Controls section of the Technical Specifications describing the control of Surveillance Frequencies. The surveillance test requirements remain in the Technical Specifications. The control of changes to the Surveillance Frequencies will be in accordance with the Surveillance Frequency Control Program. The Program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met. This change is designated as a less restrictive removal of detail change, because the Surveillance Frequency is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 2 – Relaxation of Applicability)* CTS 3.7.1.6 requires four MFIVs, four MFRVs, and four MFRV bypass valves to be OPERABLE in MODES 1, 2 and 3. ITS LCO 3.7.3 requires four MFIVs, four MFRVs, and four MFRV bypass valves to be OPERABLE in MODES 1, 2 and 3 except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. This changes the CTS by making the Specification not applicable in MODES 1, 2, and 3 when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

DISCUSSION OF CHANGES
ITS 3.7.3, MAIN FEEDWATER ISOLATION VALVES (MFIVS), MAIN FEEDWATER REGULATING VALVES (MFRVS) AND MFRV BYPASS VALVES

The purpose of CTS 3.7.1.6 Applicability is to ensure that the MFIVs, MFRVs and MFRV bypass valves are OPERABLE and capable of closing when required to support the safety analysis. This change is acceptable because the requirements continue to ensure that the structures, systems, and components are maintained in the MODES and other specified conditions assumed in the safety analyses and licensing basis. When the MFIVs, MFRVs, and MFRV bypass valves are in the closed position or isolated, they are essentially in their assumed accident position. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

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

CTS

MFIVs , and MFRVs and [Associated MFRV Bypass Valves] 1
3.7.3

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs) , and Main Feedwater Regulation Regulating Valves (MFRVs) and [Associated MFRV Bypass Valves] 2

3.7.1.6 LCO 3.7.3 [Four] MFIVs, [four] MFRVs, [and associated four MFRV bypass valves] shall be OPERABLE. 1

Applicability APPLICABILITY: MODES 1, [and 2] [2, and 3] except when all MFIVs, MFRVs, and MFRVs [or associated bypass valve] s is are closed and [de-activated] [or isolated by a closed manual valve]. 1 3

ACTIONS

-----NOTE-----

ACTION f Separate Condition entry is allowed for each valve or flow path. 5

CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION a — A. One or more MFIVs inoperable.	A.1 Close or isolate MFIV. AND	[72] hours	1
ACTION d	A.2 Verify MFIV is closed or isolated.	Once per 7 days	
ACTION b — B. One or more MFRVs inoperable.	B.1 Close or isolate MFRV. AND	[72] hours	1
ACTION d	B.2 Verify MFRV is closed or isolated.	Once per 7 days	
ACTION c — C. [One or more [MFRV or preheater] bypass valves inoperable.	C.1 Close or isolate bypass valve. AND	[72] hours	1
ACTION d	C.2 Verify bypass valve is closed or isolated.	Once per 7 days]	1

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CTS

MFIVs, and MFRVs and [Associated MFRV Bypass Valves] (1)
3.7.3

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION e D. One or more flow paths with Two valves in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours (5)
ACTIONS a, b, c, e E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. [AND E.2 Be in MODE 4.	6 hours 12 hours] (1)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 4.7.1.6 SR 3.7.3.1	Verify the isolation time of each MFIV, MFRV[, and associated MFRV bypass valve] is within limits.	In accordance with the Inservice Testing Program (1)
SR 4.7.1.6 SR 3.7.3.2	Verify each MFIV, MFRV[, and associated MFRV bypass valves] actuates to the isolation position on an actual or simulated actuation signal.	[[18] months (1) (4) OR In accordance with the Surveillance Frequency Control Program] (4)

CTS

MFIVs , and MFRVs and [Associated MFRV Bypass Valves] 1
3.7.3

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs) , and Main Feedwater Regulation Regulating Valves (MFRVs) and [Associated MFRV Bypass Valves] 2

3.7.1.6 LCO 3.7.3 [Four] MFIVs, [four] MFRVs, [and associated four MFRV bypass valves] shall be OPERABLE. 1

Applicability APPLICABILITY: MODES 1, [and 2] [2, and 3] except when all MFIVs, MFRVs, and MFRVs [or associated bypass valves] is are closed and [de-activated] [or isolated by a closed manual valves]. 1 3

ACTIONS

-----NOTE-----

ACTION f Separate Condition entry is allowed for each valve or flow path. 5

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION a	A. One or more MFIVs inoperable.	A.1 Close or isolate MFIV.	[72] hours	1
		AND		
ACTION d		A.2 Verify MFIV is closed or isolated.	Once per 7 days	
ACTION b	B. One or more MFRVs inoperable.	B.1 Close or isolate MFRV.	[72] hours	1
		AND		
ACTION d		B.2 Verify MFRV is closed or isolated.	Once per 7 days	
ACTION c	C. [One or more [MFRV or preheater] bypass valves inoperable.	C.1 Close or isolate bypass valve.	[72] hours	1
		AND		
ACTION d		C.2 Verify bypass valve is closed or isolated.	Once per 7 days]	1

CTS

MFIVs, and MFRVs and [Associated MFRV Bypass Valves] (1)
3.7.3

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
ACTION e	D. One or more flow paths with Two valves in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours	(5)
ACTIONS a, b, c, e	E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. [AND E.2 Be in MODE 4.	6 hours 12 hours]	(1)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
SR 4.7.1.6	SR 3.7.3.1	Verify the isolation time of each MFIV, MFRV[, and associated MFRV bypass valve] is within limits.	In accordance with the Inservice Testing Program	(1)
SR 4.7.1.6	SR 3.7.3.2	Verify each MFIV, MFRV[, and associated MFRV bypass valves] actuates to the isolation position on an actual or simulated actuation signal.	[[18] months OR In accordance with the Surveillance Frequency Control Program]	(1) (4) (4)

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.3, MAIN FEEDWATER ISOLATION VALVES (MFIVs), MAIN FEEDWATER REGULATING VALVES (MFRVs) AND MFRV BYPASS VALVES

1. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

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

3. Typographical error corrected. The word "all" should be included, similar to the NUREG-1430, LCO 3.7.3 Applicability. Also, the word "or" should be "and," because in addition to MFIVs, MFRVs and MFRV bypass valves are required to be OPERABLE.

4. ISTS SR 3.7.3.2 (ITS SR 3.7.3.2) provides two options for controlling the Frequency of the Surveillance Requirement. SQN is proposing to control the Surveillance Frequency under the Surveillance Frequency Control Program.

5. ISTS 3.7.3 ACTIONS D provides actions for two inoperable valves in the same flow path. ISTS 3.7.3 ACTIONS Note allows separate condition entry for each valve. ITS 3.7.3 ACTIONS Note also allows separate condition entry for each flow path. ITS 3.7.3 ACTION D is reworded to reflect the application of the separate condition entry allowance for multiple flow paths with two inoperable valves. This change provides the same allowance for separate condition entry into ACTION D that is provided for entry into ACTIONS A, B and C, and is consistent with the current licensing basis.

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

B 3.7 PLANT SYSTEMS

B 3.7.3 Main Feedwater Isolation Valves (MFIVs) , ~~and~~ Main Feedwater ~~Regulation~~ Regulating Valves (MFRVs) ~~[~~and ~~Associated~~ MFRV Bypass Valves~~]~~ 1 2

BASES

BACKGROUND

The MFIVs isolate main feedwater (MFW) flow to the secondary side of the steam generators following a high energy line break (HELB). The safety related function of the MFRVs is to provide the second isolation of MFW flow to the secondary side of the steam generators following an HELB. Closure of the MFIVs ~~and associated bypass valves~~ or MFRVs and ~~associated~~ MFRV bypass valves terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring upstream of the MFIVs or MFRVs. 3 The consequences of events occurring in the main steam lines or in the MFW lines downstream from the MFIVs will be mitigated by their closure. Closure of the MFIVs ~~and associated bypass valves~~, or MFRVs and ~~associated~~ MFRV bypass valves, effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment, and reducing the cooldown effects for SLBs. 3

The MFIVs ~~and associated bypass valves~~, or MFRVs and ~~associated~~ MFRV bypass valves, isolate the nonsafety related portions from the safety related portions of the system. In the event of a secondary side pipe rupture inside containment, the valves limit the quantity of high energy fluid that enters containment through the break, and provide a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops. 3

One MFIV ~~and associated bypass valve~~, and one MFRV and its ~~associated~~ MFRV bypass valve, are located on each MFW line, outside but close to containment. 3 The MFIVs , MFRVs, and MFRV~~s~~ bypass valves are located upstream of the AFW injection point so that AFW may be supplied to the steam generators following MFIV or MFRV closure. 1 The piping volume from these valves to the steam generators must be accounted for in calculating mass and energy releases, and refilled prior to AFW reaching the steam generator following either an SLB or FWLB.

The MFIVs ~~and associated bypass valves~~, ~~and~~ , MFRVs and ~~associated~~ MFRV bypass valves, close on receipt of a T_{avg} - Low coincident with reactor trip (P-4) , safety injection, or steam generator water level ~~-~~ - high high signal. 3 1 They may also be actuated manually. In addition to the MFIVs ~~and associated bypass valves~~, and the MFRVs and ~~associated~~ MFRV bypass valves, a check valve ~~inside~~ outside containment is available. 3 1 The check valve isolates the feedwater line, penetrating containment, and ensures that the consequences of events do not exceed the capacity of the containment heat removal systems.

BASES

BACKGROUND (continued)

A description of the MFIVs and MFRVs is found in the FSAR, U 1
Section [10.4.7] (Ref. 1). 2

APPLICABLE SAFETY ANALYSES

The design basis of the MFIVs and MFRVs is established by the analyses for the large SLB. It is also influenced by the accident analysis for the large FWLB. Closure of the MFIVs and associated bypass valves, 3
or MFRVs and associated bypass valves, may also be relied on to terminate an SLB for core response analysis and excess feedwater event - MFRV
upon the receipt of a steam generator water level -high high signal or a feedwater isolation signal on high steam generator level. 1

MFRV
Failure of an MFIV, MFRV, or the associated bypass valves to close following an SLB or FWLB can result in additional mass and energy being delivered to the steam generators, contributing to cooldown. This failure also results in additional mass and energy releases following an SLB or FWLB event. 3

, , and MFRV bypass valves
The MFIVs and MFRVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii). 4

LCO

MFRV
This LCO ensures that the MFIVs, MFRVs, and their associated bypass valves will isolate MFW flow to the steam generators, following an FWLB or main steam line break. These valves will also isolate the nonsafety related portions from the safety related portions of the system. 3 4

,
This LCO requires that [four] MFIVs and associated bypass valves and 2 3
four MFRV [four] MFRVs [and associated bypass valves] be OPERABLE. The
MFRV , MFIVs and MFRVs and the associated bypass valves are considered OPERABLE when isolation times are within limits and they close on an isolation actuation signal.

Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an SLB or FWLB inside containment. If a feedwater isolation signal on high steam generator level is relied on to terminate an excess feedwater flow event, failure to meet the LCO may result in the introduction of water into the main steam lines.

APPLICABILITY

, MFRV
The MFIVs and MFRVs and the associated bypass valves must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and steam generators. This ensures that, in the event of an HELB, a single failure cannot result in the blowdown of more than one steam generator. In MODES 1, 2, [and 3], the MFIVs , and 3 2
MFRV MFRVs and the associated bypass valves are required to be OPERABLE to limit the amount of available fluid that could be added to containment in the case of a secondary system pipe break inside containment. When the valves are closed and de-activated or isolated by a closed manual valve, they are already performing their safety function. 3 3

BASES

APPLICABILITY (continued)

MFRV

In MODES 4, 5, and 6, steam generator energy is low. Therefore, the MFIVs, MFRVs, and the associated bypass valves are normally closed since MFW is not required. 3

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each valve. 3

INSERT 1

A.1 and A.2

With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function. 2

The [72] hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The [72] hour Completion Time is reasonable, based on operating experience. 2 2

Inoperable MFIVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls, to ensure that these valves are closed or isolated.

B.1 and B.2

With one MFRV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function. 2

The [72] hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The [72] hour Completion Time is reasonable, based on operating experience. 2 2

3 **INSERT 1**

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

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