Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:45 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**221**
NRC Question Number	**CSS-025**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1CSS_025.pdf** (13KB)
Attachment 2	

Response Statement

In response to CSS-025, discussion of change (DOC) L02, on pages 511 and 512 of Enclosure 2, Volume 11, will be revised. Specifically, the second paragraph, on page 512, will be revised to state, in part, "The ITS 3.6.12.6 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."

CTS 4.6.5.1.c ensures the structural integrity of the ice baskets, "by lifting and visually inspecting the accessible portions of at least 2 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." ITS SR 3.6.12.6 requires, in part, "visually inspect, for detrimental structural wear, cracks, corrosion, or other damage, two ice baskets from each group of bays." ITS SR 3.6.12.6 does not specify how the inspection is to be performed.

DOC L02, specifically addresses the deletion of the CTS 4.6.5.1.c requirement for, "lifting of the ice baskets a minimum of 10 feet," to perform the visual inspection of the accessible portions of at least two ice baskets. DOC L02 references the ITS 3.6.12.6 Bases which includes clarifying guidance that the intent of the surveillance is to perform an inspection of the full-length of the basket and to monitor the effect of the ice condenser environment on ice baskets. DOC L02 accurately documents this change as a less stringent surveillance requirement.

Therefore, ITS 3.6.12 Limiting Condition for Operation will continue to be met by ensuring a full-length inspection of the basket is performed without having to specify how high the ice basket must be lifted to perform the required inspection.

Response Date/Time	**8/4/2014 11:55 AM**
Closure Statement	
Question Closure	

Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/4/2014 10:55 AM**
Date Modified	
Modified By	

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 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 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 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 lbs of ice (total of 2,187,250 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 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

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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.

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Licensee Response/NRC Response/NRC Question Closure

Id	**286**
NRC Question Number	**CSS-025**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/21/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/21/2014 3:05 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**120**
NRC Question Number	**CSS-026**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.12**
DOC Number	**M-1**
JFD Number	
JFD Bases Number	
Page Number(s)	**508**
NRC Reviewer Supervisor	**Select**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**1. Page , 508 DOC M01; page 540, SR 3.6.12.3 reference 4 in the 2nd paragraph; page 544, Reference 4, describes the CTS change as:** **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. Bases reference 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, pertains to the new requirement to verify the required mass of ice is in each basket sampled.** **DOC M01 justifies the addition of the surveillance to verify the required mass of ice is present. Please show the basis for concluding that 600 pounds of ice is needed to assure that the necessary quality of the ice bed is maintained and how the surveillance will ensure that the limiting condition for operation will be met.**
Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	

Date Added	**5/30/2014 2:46 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**156**
NRC Question Number	**CSS-026**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is withdrawn.**
Question Closure Date	**6/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Carl Schulten** **Roger Scott**
Added By	**Carl Schulten**
Date Added	**6/27/2014 8:47 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**121**
NRC Question Number	**CSS-027**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	**M-1**
JFD Number	
JFD Bases Number	
Page Number(s)	**557**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 557, DOC M01 describes the CTS change as:

> **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.**

The staff disagrees with TVA that the changes made to the CTS solely requires restoring the ice condenser doors within 48 after the 14 day allowed outage time has expired. CTS 3.6.5.3.b requires restoring the ice condenser doors to operable status within 48 hours of discovery that the CTS 3.6.5.3.b requirement to maintain the ice bed temperature ≤ 27 °F is not met anytime during the 14 day AOT.

The staff notes that the misunderstanding of CTS requirements is probably the reason for deviating from STS Condition C by proposing the additional entry into the applicable Condition and Required Actions of LCO 3.6.12 as a replacement. The staff assessment of CTS 3.6.5.3 is that making the proposed changes to ITS Condition C (and the conforming change to Condition D) would be a change to CTS as well as STS resulting in the change being a new BSIs not listed in LAR Enclosure 3.

Please retain CTS by revising the ITS 3.6.13 to incorporate STS 3.6.12

Conditions C (and D) without deviation.

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:48 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**201**
NRC Question Number	**CSS-027**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 3.6.13 CSS-027.pdf** (119KB)
Attachment 2	
Response Statement	**In response to CSS-027, ISTS 3.6.16 (ITS 3.6.13) Conditions C and D, on pages 564 and 569 of Enclosure 2, Volume 11, will be retained without deviation. Additionally, the following changes will be necessary:** **1. CTS markups for 3.6.5.3 ACTION b. will be revised to retain the statement, "otherwise, restore the doors to their closed position or OPERABLE status (as applicable) within 48 hours." (Pages 551 and 554)** **2. Discussion of change (DOC) M01 will be deleted. (Pages 551, 554, and 557)** **3. ITS 3.6.13, Inserts 2 and 3 will be deleted. (Pages 565 and 570)** **4. Justification for deviation (JFD) 6 will be deleted. (Pages 564, 565, 569, 570, and 574)** **5. The ITS 3.6.13 Bases will be revised to retain ISTS Bases text for Actions B.1 and B.2 and C.1. The associated JFD indicators in the right hand margin will be deleted. (Pages 580, 582, 592, and 594)** **6. ITS 3.6.13 Bases Insert 2 will be deleted. (Pages 583 and 595)** **7. Bases JFD 8 will be deleted. (Page 601)** **See Attachment 1 for the draft revised CTS and ISTS markups and deletion of DOC M01, JFD 6, and Bases JFD 8.**
Response Date/Time	**7/21/2014 3:10 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**

Added By	**Scott Bowman**
Date Added	**7/21/2014 2:08 PM**
Date Modified	
Modified By	

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 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

ACTION D within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION B 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

ACTION D COLD SHUTDOWN within the following 30 hours.

ACTION C

Stet

~~Add proposed Condition C~~ ~~M01~~

SURVEILLANCE REQUIREMENTS

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be: L03

every 12 hours

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, and

In accordance with the Surveillance Frequency Control Program LA01

b. Demonstrated OPERABLE at least ~~once per 18 months~~ by:

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.

SR 3.6.13.3 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction.

Perform a torque test of

SR 3.6.13.5 3. ~~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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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 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.

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~~

SURVEILLANCE REQUIREMENTS

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be:

L03

~~every 12 hours~~

In accordance with the Surveillance Frequency Control Program

LA01

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, and

b. Demonstrated OPERABLE ~~at least once per 18 months~~ by:

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.

SR 3.6.13.3 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction.

Perform a torque test of

SR 3.6.13.5 3. ~~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

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.

MORE RESTRICTIVE CHANGES

Not Used

~~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.~~

~~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.~~

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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 position~~s~~.	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~~ 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. AND D.2 Be in MODE 5.	6 hours 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.

~~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.~~

~~6~~ ~~**INSERT 3**~~

~~OR~~

~~Required Action B.2 and associated Completion Time not met.~~

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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. 1 3

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

ACTIONS

DOC L01 1.

---NOTE S---

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 position~~s~~.	Once per 4 hours 14 days	3 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. AND D.2 Be in MODE 5.	6 hours 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.

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.~~

6 ~~**INSERT 3**~~

~~OR~~

~~Required Action B.2 and associated Completion Time not met.~~

Enclosure 2, Volume 11, Rev. 0, Page 570 of 724

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

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).~~

1

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

~~A~~ Note 1 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.

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 Completion Time ~~Frequency~~ of once per 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 at or 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.~~ 6 7 8 5

Stet

1

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.~~ ~~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

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**~~

~~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.

Enclosure 2, Volume 11, Rev. 0, Page 583 of 724

1

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.

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~~ Completion Time of once per 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 at or 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.~~ 6 6 7 8 5

Stet

Enclosure 2, Volume 11, Rev. 0, Page 592 of 724

1

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.~~

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

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.~~

~~OR~~

5 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

~~5~~

~~INSERT 2~~

~~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.

Enclosure 2, Volume 11, Rev. 0, Page 595 of 724

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.~~

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.

Licensee Response/NRC Response/NRC Question Closure

Id	**290**
NRC Question Number	**CSS-027**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/25/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/25/2014 10:50 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**122**
NRC Question Number	**CSS-028**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	**L-2**
JFD Number	
JFD Bases Number	
Page Number(s)	**561**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 561, DOC L02 describes the CTS change as:

> **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 [JFD 4 proposed to add] ACTIONS Note 2 [which] 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 walk downs, 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 staff notes that proposed change would be a generic relaxation to the LCO 3.6.13 requirements that has not been reviewed and approved by the staff and is a new BSI not listed in LAR Enclosure 3. A few of the circumstances listed in proposed ACTIONS Note 2 are preventative or corrective maintenance. ITS LCO 3.0.2 would permit voluntary entry into LCO 3.6.13 Actions, but would require compliance with TS Actions.

Please retain CTS by revising the ITS 3.6.13 to incorporate STS 3.6.12 Conditions C (and D) without deviation.

Attach File

1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:50 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**259**
NRC Question Number	**CSS-028**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**In response to CSS-028, the following information is provided regarding the Staff's position that the proposed change is a generic relaxation to ITS LCO 3.6.13 requirements. The proposed relaxation currently exists in the ISTS 3.6.16 Bases for ACTIONS B.1 and B.2. The ISTS Bases states, "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."**

To preclude this issue, SQN has added a Note 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. The proposed ACTIONS Note maintains the intent of the ISTS Bases allowance.

ITS LCO 3.6.13 states, "The ice condenser inlet doors, intermediate deck doors, and top deck doors shall be OPERABLE and closed." ITS 3.6.13 Condition B states, "one or more ice condenser doors inoperable for reasons other than Condition A or not closed." ITS 3.6.13 Condition A states, "one or more ice condenser inlet doors inoperable due to being restrained from opening." Without the proposed ITS ACTIONS Note 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.), if an individual opens or stands on an intermediate deck or an upper deck door then the door is inoperable and ITS Condition B should be entered. The ISTS Bases for ACTIONS B.1 and B.2 inappropriately modifies this requirement and states that entry into Condition B is not required. It is SQN's position that the Bases allowance modifies the Specification. Therefore, the addition of the ACTIONS Note is appropriate.

The second part of RAI CSS-028 states, "Please retain CTS by revising the ITS 3.6.13 to incorporate STS 3.6.12 Conditions C (and D) without

deviation." See the SQN response to RAI CSS-027 concerning the retention of Conditions C and D without deviation.

Response Date/Time	**8/11/2014 6:05 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/11/2014 5:04 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**337**
NRC Question Number	**CSS-028**
Select Application	**NRC Response**
Attachment 1	
Attachment 2	

Response Statement

Enclosure 2, Volume 11, Rev. 0, Page 565 of 724 of the licensee's submittal adds Insert 1 as a NOTE to ITS LCO 3.6.13, "Ice Condenser Doors". This NOTE states:

"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."

The licensee is proposing to add this NOTE under ACTIONS which would suggest it applies to the entire specification.

Since this NOTE only pertains to the intermediate deck and top deck doors, it is appropriate to limit its application to Condition B. Please modify the NOTE by specifying Condition B or by moving the NOTE from ACTIONS to Condition B. Also, as necessary, update all other relevant sections and markups including ITS Bases, Discussion of Change and Justification for Deviation.

Although the NOTE would allow the licensee to not enter LCO 3.6.13 for short durations to perform the specified activities, ITS SR 3.0.1 requires that surveillances be met at all times while in the mode of applicability unless otherwise stated in the LCO. Accordingly, since ITS SR 3.6.12.1 requires verification that the "maximum ice bed temperature is ≤ 27°F, the licensee is still required to ensure that the ice bed temperature does not exceed the 27°F limit. As required by SR 3.0.1, SR 3.6.12.1 is required to be met both during the performance of the Surveillance and between performances of the Surveillance.

Response Date/Time	**9/18/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman**

	Michelle Conner **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott** **Caroline Tilton**
Added By	**Khadijah Hemphill**
Date Added	**9/18/2014 5:56 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**350**
NRC Question Number	**CSS-028**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 for CSS-028.pdf** (35KB)
Attachment 2	
Response Statement	**This response supplements the first response to CSS-028 based on NRC response dated September 18, 2014.** **ITS 3.6.13 Actions Note 2, on pages 565 and 570 of Enclosure 2, Volume 11, will be modified to state, "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 Condition B is not required." Additionally, the ITS 3.6.13 Bases Actions Section will be revised to reflect the change to the ITS Actions Note 2 (pages 581 and 593).** **See Attachment 1 for draft revised ITS pages.**
Response Date/Time	**9/26/2014 6:45 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**9/26/2014 5:43 AM**
Date Modified	
Modified By	

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

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.

6 **INSERT 3**

OR

Required Action B.2 and associated Completion Time not met.

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

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.

6 **INSERT 3**

OR

Required Action B.2 and associated Completion Time not met.

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

Enclosure 2, Volume 11, Rev. 0, Page 581 of 724

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

Enclosure 2, Volume 11, Rev. 0, Page 593 of 724

Licensee Response/NRC Response/NRC Question Closure

Id	**361**
NRC Question Number	**CSS-028**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**9/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**9/26/2014 10:28 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**123**
NRC Question Number	**CSS-029**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	**L-3**
JFD Number	
JFD Bases Number	
Page Number(s)	**561, 575**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 561, DOC L03 describes the CTS change as:

> **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 change is acceptable because the new Surveillance Frequency will provide an acceptable level of equipment reliability. […]… During normal operation these conditions are not expected and the doors should remain closed. Therefore, the 12 hour Frequency is considered sufficient.**

Page 575, JFD 7 justifies the changes to ITS SR 3.6.13.1 (Verify all inlet doors are ~~indicate~~ closed ~~by the Inlet Door Position Monitoring System~~.) as:

> **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.**

The staff disagrees with the TVA proposal to deviate from the ISTS by not requiring continuous monitoring of the ice condenser doors and notes that writing a justification for deviation that does not acknowledge that the ISTS (which is the staff precedent for complying with 50.36) requires continuous monitoring of the closed status of the ice condenser doors has not made a case for a deviation at all. Further, the staff notes the citation of the Wilgus/Murley letter dated May 9, 1988 with respect to SRs is contrary to the content of the letter which addresses application of the Commission's Policy Statement Criteria to TS LCOs. Additionally, DOC L03 and DOC L02 make contradictory statements in that DOC L03 states the 12 hour Frequency for SR 3.6.13.1 is sufficient because "During normal operation these conditions are not expected and the doors should remain closed" and DOC L02 proposes a relaxation for the doors to be closed:

> **"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] should not [be] required."**

The staff view is that CTS 4.6.5.3.1.a and ISTS SR 3.6.16.1 require continuous monitoring of ice condenser door position. Please revise SR 3.6.13.1 to include the requirement to monitor ice condenser door position continuously and verify the position every 12 hours. The basis for the verification is to make operators aware of an inadvertent door opening.

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**

Date Modified	
Modified By	
Date Added	**5/30/2014 2:54 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**200**
NRC Question Number	**CSS-029**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS_029.pdf** (79KB)
Attachment 2	

Response Statement

In response to CSS-029, ISTS SR 3.6.16.1 (ITS SR 3.6.13.1), on pages 566 and 571 of Enclosure 2, Volume 11, will be retained without deviation. Specifically, ITS SR 3.6.13.1 will read, "Verify all inlet doors indicate closed by the Inlet Door Position Monitoring System." The Inlet Door Position Monitoring System will continuously monitor the status of the door position and the doors will be verified closed every 12 hours by the operators in the control room. Additionally, the following changes will be necessary:

1. **CTS markups for 4.6.5.3.1.a will be revised to retain the phrase, "Continuously monitored and." (Pages 551 and 554)**

2. **Discussion of change (DOC) L03 will be deleted, as well as, L03 indicators. (Pages 551, 554, and 561)**

3. **Justification for deviation (JFD) 7 will be deleted. (Pages 566, 571, and 575)**

4. **The ITS 3.6.13 Bases for SR 3.6.13.1 will be revised to retain the ISTS Bases text associated with the Inlet Door Position Monitoring System. (Pages 582 and 594)**

5. **ITS 3.6.13 Bases Insert 3 will be deleted. (Pages 583 and 595)**

See Attachment 1 for the draft revised CTS and ISTS markups and deletion of DOC L03 and JFD 7.

Response Date/Time	**7/21/2014 3:05 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**

	Caroline Tilton
Added By	**Scott Bowman**
Date Added	**7/21/2014 2:03 PM**
Date Modified	
Modified By	

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.

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

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

b. Demonstrated OPERABLE at least ~~once per 18 months~~ In accordance with the Surveillance Frequency Control Program by: 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.

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. ~~Verifying that the torque required to open~~ Perform a torque test of 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

ITS A01 3.6.13

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 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
ACTION D within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION B 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
ACTION D ACTION C SHUTDOWN within the following 30 hours. Add proposed Condition C M01

SURVEILLANCE REQUIREMENTS

Stet

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be: ~~L03~~

~~every 12 hours~~ In accordance with the Surveillance Frequency Control Program LA01

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, and

b. Demonstrated OPERABLE ~~at least once per 18 months~~ by:

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.

SR 3.6.13.3 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction.

Perform a torque test of LA02

SR 3.6.13.5 3. ~~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.~~

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

~~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.~~

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CTS

Ice Condenser Doors ~~(Ice Condenser)~~
3.6.~~16~~ 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~~ ~~OR~~ 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

CTS

Ice Condenser Doors ~~(Ice Condenser)~~
3.6.~~16~~ 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~~ ~~OR~~ 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

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.13, ICE CONDENSER DOORS

Not Used

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.

1

BASES

ACTIONS (continued)

C.1

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

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.

5

SURVEILLANCE REQUIREMENTS

SR 3.6.~~16~~.1

13

Stet

1

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

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.~~

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BASES

ACTIONS (continued)

C.1

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

If the ice condenser doors cannot be restored to OPERABLE status and closed positions 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. 5

SURVEILLANCE REQUIREMENTS

SR 3.6.~~16~~.1 13 1

Stet

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**

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.~~

Licensee Response/NRC Response/NRC Question Closure

Id	**289**
NRC Question Number	**CSS-029**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/25/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/25/2014 10:49 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**124**
NRC Question Number	**CSS-030**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**551**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 551, CTS 4.6.5.3.1.b.2 states:

> **Verify *openingl* [emphasis added] of each door is not impaired by ice, frost, debris, or obstruction.**

Please provide a DOC for deleting this CTS requirement “verify opening of each door is impaired” in proposed ITS SR 3.6.13.3.

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:55 PM**
Notification	**Khadijah Hemphill Andrew Hon Lynn Mynatt Lisa Regner Ray Schiele Carl Schulten Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**194**
NRC Question Number	**CSS-030**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 3.6.13 CSS-030.pdf** (36KB)
Attachment 2	
Response Statement	**In response to CSS-030, discussion of change (DOC) A02 will be added to DISCUSSION OF CHANGES ITS 3.6.13, ICE CONDENSER DOORS (page 557 of Enclosure 2, Volume 11) and to the CTS markups for Units 1 and 2 (pages 551 and 554). DOC A02 states:** **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.** **See Attachment 1 for the draft DOC A02 and revised CTS markups for Unit 1 and 2.**
Response Date/Time	**7/21/2014 5:00 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Caroline Tilton**

Added By	**Scott Bowman**
Date Added	**7/21/2014 3:58 AM**
Date Modified	
Modified By	

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.

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

SURVEILLANCE REQUIREMENTS

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be: L03

~~every 12 hours~~

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, and

In accordance with the Surveillance Frequency Control Program LA01

b. Demonstrated OPERABLE at least ~~once per 18 months~~ by:

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.

SR 3.6.13.3 2. Verifying that opening of each door is not impaired by ice, frost, debris, or obstruction. A02

Perform a torque test of

SR 3.6.13.5 3. ~~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

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 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.

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

SURVEILLANCE REQUIREMENTS

4.6.5.3.1 Inlet Doors - Ice condenser inlet doors shall be: L03

~~every 12 hours~~

In accordance with the Surveillance Frequency Control Program LA01

SR 3.6.13.1 a. ~~Continuously monitored and~~ determined closed, and

b. Demonstrated OPERABLE ~~at least once per 18 months~~ by:

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.

Perform a torque test of

SR 3.6.13.5 3. ~~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

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

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.

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.

Enclosure 2, Volume 11, Rev. 0, Page 557 of 724

<u>Insert DOC A02</u>

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.

Licensee Response/NRC Response/NRC Question Closure

Id	**287**
NRC Question Number	**CSS-030**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/25/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/25/2014 10:45 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**125**
NRC Question Number	**CSS-031**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**552**
NRC Reviewer Supervisor	**Select**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 552, CTS 4.6.5.3.3 states:

> **That no condensation, frost, or ice has formed on the doors or blankets which would *restrict their lifting* [emphasis added] and opening if required.**

Please provide a DOC for deleting this CTS requirement "would restrict their lifting" in proposed ITS SR 3.6.13.7.

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:57 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**157**
NRC Question Number	**CSS-031**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is withdrawn.**
Question Closure Date	**6/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Carl Schulten** **Roger Scott**
Added By	**Carl Schulten**
Date Added	**6/27/2014 8:53 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**126**
NRC Question Number	**CSS-032**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.13**
DOC Number	
JFD Number	**6**
JFD Bases Number	
Page Number(s)	**601**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**1. Page 601, JFD 6 Bases for ACTIONS B.1 and B.2 (page 580) justifies proposed changes "Ifoneormoreicecondenserdoorsaredeterminedtobe~~partiallyopenor otherwise~~inoperableforreasonsotherthanConditionAorifadooris foundthatisnotclosed, […]. in the as:** **Changes have been made to be consistent with the ITS.** **ITS 3.6.5.3.b retains ISTS Condition B in its entirety. Please revise the Condition B.1 and B.2 Bases to retain the deleted discussion shown above.**
Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**5/30/2014 2:58 PM**
Notification	**Khadijah Hemphill**

Andrew Hon
Lynn Mynatt
Lisa Regner
Ray Schiele
Carl Schulten
Roger Scott

Licensee Response/NRC Response/NRC Question Closure

Id	**202**
NRC Question Number	**CSS-032**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS_032.pdf** (26KB)
Attachment 2	
Response Statement	**In response to CSS-032, ITS 3.6.13 Bases, on pages 580 and 592 of Enclosure 2, Volume 11, will be revised to retain ISTS Bases wording for ACTIONS B.1 and B.2. Specifically, the first sentence for ITS 3.6.13 Bases ACTIONS B.1 and B.2 will be revised to read, in part, "If one or more ice condenser doors are determined to be partially open or otherwise inoperable for reasons other than Condition A …"** **See Attachment 1 for the draft revised ITS 3.6.13 Bases.**
Response Date/Time	**7/21/2014 3:15 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**7/21/2014 2:12 PM**
Date Modified	
Modified By	

1

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.

B.1 and B.2

STET

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~~ Completion Time of once per 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 at or 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.~~

6

6 7

8

5

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.

B.1 and B.2

STET

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 Completion Time ~~Frequency~~ of once per 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 at or 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.~~ 6 7 8 5

Licensee Response/NRC Response/NRC Question Closure

Id	**291**
NRC Question Number	**CSS-032**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/25/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/25/2014 10:51 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**127**
NRC Question Number	**CSS-033**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.14**
DOC Number	**LA-3**
JFD Number	
JFD Bases Number	
Page Number(s)	**615**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 615, DOC LA03, describes the CTS change as:

> **CTS Table 3.6-3 specifies the divider barrier seal acceptable 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.**

DOC LA03 discusses that the removal of this detail, which is related to system design, is acceptable because the removed information will be adequately controlled in the UFSAR.

Please provide the UFSAR reference that states the divider barrier seal material shall be Prespray Corp. EPDM Compound E603 (2 ply Dacron Coated EPDM).

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	

Modified By	
Date Added	**5/30/2014 2:59 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**222**
NRC Question Number	**CSS-033**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 UFSAR Page 3.8-43 Markup.pdf** (60KB)
Attachment 2	
Response Statement	**As a result of the transition from the CTS to ITS at SQN, there are a number of changes resulting in relocation to the SQN Updated Final Safety Analysis Report (UFSAR). These changes are being identified and incorporated during the Implementation Phase of the SQN ITS Project. Items identified in Enclosure 2 of the SQN ITS License Amendment Request as being relocated to the SQN UFSAR will be incorporated in the SQN UFSAR using the UFSAR update process; TVA's Final Safety Analysis Report management procedure. This process includes developing UFSAR change packages that will include items relocated from the SQN CTS. In accordance with TVA procedures, these UFSAR change packages are processed and incorporated into the SQN UFSAR and transmitted to the NRC in accordance with the requirements of 10 CFR 50.4, "Written communications," and in accordance with the schedule requirements set forth in 10 CFR 50.71(e)(4).** **A draft markup of SQN UFSAR Section 3.8.3.1.4, "Seals Between Upper and Lower Compartments (Divider Barrier)," (SQN UFSAR page 3.8-43) is provided in this RAI response for information only to show the relocated information.**
Response Date/Time	**8/4/2014 12:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/4/2014 10:59 AM**
Date Modified	
Modified By	

During reactor operation this compartment is sealed across the top by the concrete missile shield and at the refueling canal by a concrete gate.

Seals Between Upper and Lower Compartments (Divider Barrier)

See Figure 3.8.3-1.

The seals extend across the gap between the inside surface of each steel containment vessel and the concrete structure within each vessel. They are located along the bottom of the concrete floor under the ice condenser, at Elevations 720 feet, 5 inches and 727 feet, 9 inches between the ends of the ice condenser and the refueling canal concrete structure, and along the vertical sides of the refueling canal structure. These seals form part of the barrier between the upper and lower compartment of the containment vessels.

Similar seals classified as non-Category I butt against this seal at four places.

The seals consist of long strips of flexible coated fabric with both edges hemmed to form pockets into which metal clamp bars are inserted. These strips are field-spliced and glued overlay joints to form a continuous seal.

made of Presray Corporation EPDM Compound E603 (2 ply Dacron Coated EPDM)

The seals are attached to the containment vessel and the interior concrete structure with bolted clamp angles, spaced 1 foot ± apart. The angles grip the clamp bars in the pockets at the seal edges.

The seals form part of the divider barrier between the upper and lower compartments of the containment vessels. During normal operating conditions, the seals prevent airflow around the ice condensers. In an accident, the seals and the other divider parts limit the amount of hot gases, steam, and vapor that can bypass the ice condensers. The seals will maintain their integrity for the first 12 hours after an accident. A small amount of leaking during this period is permissible.

The seals will maintain their integrity during earthquake conditions and effectively maintain their air seal. The seals will function effectively in a post-earthquake condition.

3.8.3.1.5 Refueling Canal Walls and Floor (Divider Barrier)

These irregular shaped walls and slabs vary in thickness and enclose an area approximately 19 feet by 36 feet. This area will be filled with water along with the compartment above the reactor during refueling operations. The water level will be about 35 feet above the canal floor. The reactor internals will be removed and stored in the refueling canal during refueling. Refueling canal walls and floor are shown in Figure 1.2.3-11.

3.8.3.1.6 Crane Wall

This approximately 3-foot-thick, 117-foot-high cylindrical wall encloses an 83-foot-inside-diameter area containing the reactor, reactor coolant pumps, steam generators,

Licensee Response/NRC Response/NRC Question Closure

Id	**292**
NRC Question Number	**CSS-033**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:05 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**128**
NRC Question Number	**CSS-034**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.14**
DOC Number	**LA-4**
JFD Number	
JFD Bases Number	
Page Number(s)	**616**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	

1. Page 616, DOC LA04, describes the CTS change as:

> **CTS Table 3.6-3 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 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.**

CTS Table 3.6-3 notation is revised to delete the LOCA environments that must be simulated to demonstrate operability of containment barrier seal physical properties:

> **The test sequence will be as follows:2 couponswill be tested to 60psid; with nofailures, the results are acceptable.If a failureoccursat 60psig, 4 couponswillbe tested to 30 psid; with no failures, the results are acceptable.If afailure occurs at 30 psid, 5 coupons willbe sent to the manufacture for LOCA environment simulation ~~(radiation,humidity,temperature)~~ and testing to15 psid.**

The staff disagrees with TVA that removal of the LOCA environmental simulation details are not necessary to be included in the ITS SR 3.6.14.4 to provide adequate protection of public health and safety. 50.36(c)(3) states

surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. SR 3.6.14.4 could be met, using the plain language meaning of "environmental simulation" and not include one or more of the listed environments. Please revise ITS SR 3.6.14.4 to include "radiation, humidity and temperature." The staff agrees that the specific test temperature, humidity and radiation exposure may be retained in plant procedures implementing SR 3.6.14.4.

The staff also requests DOC LA04 be revised to correctly refer all units of pressure in "psid."

Attach File 1	
Attach File 2	
Issue Date	**5/30/2014**
Added By	**Carl Schulten**
Date Modified	**5/30/2014 3:15 PM**
Modified By	**Ray Schiele**
Date Added	**5/30/2014 3:00 PM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**256**
NRC Question Number	**CSS-034**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS_034.pdf** (32KB)
Attachment 2	

Response Statement

In response to CSS-034, ITS SR 3.6.14.4, on pages 621, 622, 626, and 627 of Enclosure 2, Volume 11, will be revised for SQN, Units 1 and 2. Specifically, ITS SR 3.6.14.4.c will be revised to state, "Five test coupons sent to the manufacturer for loss of coolant accident (LOCA) environment simulation (radiation, humidity, temperature) and testing to 15 psid." Additionally, the following changes will be necessary:

1. **CTS markups for Table 3.6-3 will be revised to retain, "(radiation, humidity, temperature)." (pages 611 and 627)**

2. **Discussion of change (DOC) LA04 will be deleted, as well as, LA04 indicators on the CTS markups (pages 608, 611, and 616)**

During review for the RAI response, the following issue was identified. ITS 3.6.14 Insert 2 (pages 622 and 627) has a justification for deviation (JFD) 6 indicator. This is incorrect. The JFD associated with ITS 3.6.14 Insert 2 is JFD 7. The ITS pages will be revised.

See Attachment 1 for the draft revised CTS and ITS markups and deletion of DOC LA04.

Response Date/Time	**8/11/2014 5:50 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/11/2014 4:46 AM**
Date Modified	
Modified By	

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	~~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

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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

Enclosure 2, Volume 11, Rev. 0, Page 611 of 724

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.

~~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.~~

Not Used

~~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

Enclosure 2, Volume 11, Rev. 0, Page 616 of 724

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.

(radiation, humidity, temperature)

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.

(radiation, humidity, temperature)

Licensee Response/NRC Response/NRC Question Closure

Id	**293**
NRC Question Number	**CSS-034**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:08 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**138**
NRC Question Number	**CSS-035**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.8**
DOC Number	
JFD Number	**5**
JFD Bases Number	
Page Number(s)	**380**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**1. Page 380, JFD 5 adds Insert 1 to LCO 3.6.8:**

AND Each containment region shall have at least one OPERABLE hydrogen ignitor.

JFD 5 justifies the deviation from the ISTS LCO for the Hydrogen Mitigation System as:

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 igniter 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.

The staff disagrees with TVA on the need to change ISTS LCO 3.6.10 to

ensure ACTION B is entered for the condition of one ignitor inoperable in each train and the inoperable ignitors are in the same containment region. The staff position is that for the plant condition of two required (emphasis added) hydrogen ignitors inoperable resulting in one containment region with no operable hydrogen ignitor would require entry into ITS 3.6.8 Condition B because the inoperable equipment condition is described in Condition B. Thus the proposed LCO change is contrary to the structure and content of ISTS. If the LCO is not met due to a plant condition that is not described by the ACTIONS Conditions, then LCO 3.0.3 would apply. Please revise the SQN LAR to delete JFD 5 and the insert to ITS LCO 3.6.8 discussed above.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 7:13 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**166**
NRC Question Number	**CSS-035**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 3.6.8 deletion.pdf** (63KB)
Attachment 2	
Response Statement	**In response to CSS-035, ITS LCO 3.6.8, Insert 1, and the associated justification for deviation (JFD) 5, will be deleted. Specifically, ITS LCO 3.6.8 will be revised to state, "Two HMS trains shall be OPERABLE."** **Additionally, the CTS markups for Units 1 and 2 will be revised to remove the ITS reference, in the left-hand margin, to ITS LCO 3.6.8 for CTS Footnote *. CTS Footnote * is addressed in ITS SR 3.6.8.2 which requires verification that at least one hydrogen ignitor is OPERABLE in each containment region.** **See Attachment 1 for draft changes to the CTS markups (pages 367 and 368 of Enclosure 2, Volume 11), ISTS markups (pages 374 and 377), and JFD 5 (page 380).**
Response Date/Time	**7/2/2014 2:20 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**7/2/2014 1:20 PM**
Date Modified	
Modified By	

A01

ITS ITS 3.6.8

CONTAINMENT SYSTEMS

HYDROGEN MITIGATION SYSTEM

LIMITING CONDITION FOR OPERATION

A02

two trains

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.

A01

ITS ITS 3.6.8

CONTAINMENT SYSTEMS

HYDROGEN MITIGATION SYSTEM

LIMITING CONDITION FOR OPERATION

LCO 3.6.8 3.6.4.3 The two ~~primary containment~~ 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 in each train are energized.* 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.

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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~~ ~~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	

5 ~~**INSERT 1**~~

~~AND~~

Footnote * ~~Each containment region shall have at least one OPERABLE hydrogen ignitor.~~

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~~ ~~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. <u>OR</u> 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.~~

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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.~~

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Licensee Response/NRC Response/NRC Question Closure

Id	**294**
NRC Question Number	**CSS-035**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:09 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**139**
NRC Question Number	**CSS-036**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.8**
DOC Number	
JFD Number	
JFD Bases Number	**7**
Page Number (s)	**398**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. **Page 398, JFD 7 justifies replacing the SR 3.6.8.2 Bases (page 387) with insert 3 as:**

    Changes are made to be consistent with the Specification.

    SR 3.6.8.2 Bases are changed as follows:

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

    The staff notes that ITS SR 3.6.8.2 is unchanged from ISTS SR 3.6.10.2. Therefore, the staff requests that the ISTS bases be retained for ITS SR 3.6.8.2. The staff can agree accept the addition of insert 3, but not as a replacement for the ISTS bases.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 7:16 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**167**
NRC Question Number	**CSS-036**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 3.6.8 Bases Insert 3.pdf** (934KB)
Attachment 2	
Response Statement	**In response to CSS-036, the ITS Bases, Insert 3, for ITS SR 3.6.8.2, on pages 388 and 396 of Enclosure 2, Volume 11, will be revised. Specifically, the Bases for ITS SR 3.6.8.2 will be revised to read, "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." This revision retains the ISTS Bases discussion for SR 3.6.8.2 and adds clarification that each containment region must have an OPERABLE hydrogen ignitor.** **See Attachment 1 for draft changes associated with ITS SR 3.6.8.2 Bases, Insert 3 for Units 1 and 2.**
Response Date/Time	**7/2/2014 2:25 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**7/2/2014 1:22 PM**
Date Modified	
Modified By	

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

~~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
~~]~~ 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.~~ 7 ~~[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.~~ 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.~~

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.

Enclosure 2, Volume 11, Rev. 0, Page 388 of 724

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.~~

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.

Enclosure 2, Volume 11, Rev. 0, Page 396 of 724

Licensee Response/NRC Response/NRC Question Closure

Id	**295**
NRC Question Number	**CSS-036**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman Michelle Conner Khadijah Hemphill Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:11 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**140**
NRC Question Number	**CSS-037**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.9**
DOC Number	
JFD Number	
JFD Bases Number	**4**
Page Number(s)	**414**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 414, JFD 4, Insert 1 provides background information on the characteristics of the vacuum relief valves and their locations in the containment pressure vessel as follows:

-

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

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.

The staff notes that valves in each of the three vacuum relief lines are described differently in the first paragraph from the other paragraphs of Insert 1, i.e., vacuum relief valve vice containment vessel vacuum relief valve, and containment isolation valve vice containment vessel vacuum relief isolation valve. Additionally, the first paragraph, second and third sentences are unclear because terms of art are used without explanation which may lead to a misunderstanding of the system design. Please revise Insert 1 to refer to valves using consistent language and clarify the last two sentences of the first paragraph.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 7:21 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**204**
NRC Question Number	**CSS-037**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1_CSS-037.pdf** (859KB)
Attachment 2	
Response Statement	**In response to CSS-037, ITS 3.6.9 Bases Insert 1, on pages 414 and 418 of Enclosure 2, Volume 11, will be revised. Specifically, the second sentence in the first paragraph will be revised to read, "Each line contains a containment vessel vacuum relief valve in series with a containment vessel vacuum relief isolation valve, the vacuum relief valve being outside of the isolation valve." This revision will align with the terminology used in the second and third paragraphs.** **The last two sentences of the first paragraph align with wording in the SQN FSAR, Section 6.2.6.3, that states, "In essence, each unit contains a vacuum relief valve in series with a containment isolation valve, the vacuum relief valve being outside of the isolation valve, as shown in Figure 9.4.7-1. The units are installed such that there is sufficient space between the VR [vacuum relief] system and the Shield Building to prevent contact during seismic or pressure transient motion and to allow for an adequate airflow path." Therefore, the description provided in Insert 1 is consistent with the SQN FSAR and no change is required to clarify the last two sentences of the first paragraph.** **See Attachment 1 for the draft revision to ITS 3.6.9 Bases Insert 1.**
Response Date/Time	**7/22/2014 11:35 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**7/22/2014 10:34 AM**
Date Modified	
Modified By	

B 3.6 CONTAINMENT SYSTEMS

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

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.

B 3.6 CONTAINMENT SYSTEMS

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

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.

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

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.

Licensee Response/NRC Response/NRC Question Closure

Id	**296**
NRC Question Number	**CSS-037**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:12 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**142**
NRC Question Number	**CSS-038**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.11**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**472**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 472, DOC L02 describes the change to the CTS as:

> **CTS 4.6.5.6.a (ITS SR 3.6.11.2 and SR 3.6.11.3) requires each air return fan to be demonstrated OPERABLE […]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. […] CTS 1.35, STAGGERED TEST BASIS definition, defines a testing schedule […] [as] 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. <u>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</u>. [emphasis added]**

The staff disagrees with TVA's assessment that "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. CTS

Specification 4.0.1 requires Surveillances performed within the specified surveillance interval, except as provided in Specification 4.0.3. The STAGGERD TEST BASIS definition defines the frequency for testing ARS fans to be one fan (on a staggered basis) every 46 days. Please provide the SQN surveillance test procedure for implementing CTS 4.6.5.6 Staggered Test Basis requirements and please revise the SQN ITS Frequencies for SR 3.6.11.2 and SR 3.6.11.3 to be 92 days on a STAGGERED TEST BASIS.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 7:26 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**252**
NRC Question Number	**CSS-038**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	

Response Statement

CTS 4.6.5.6.a requires each air return fan to be demonstrated OPERABLE by verifying the fan motor 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.

In the CTS, the definition of STAGGERED TEST BASIS states, "a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the <u>specified test interval</u> [emphasis added] into n equal subintervals," and b. "The testing of one system, subsystem, train or other designated component at the beginning of each subinterval."

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.

SQN proposes to adopt the ISTS SR 3.6.14.2 and SR 3.6.14.3 (ITS SRs 3.6.11.2 and 3.6.11.3) Frequency of 92 days and remove the CTS "STAGGERED TEST BASIS" scheduling requirement. Removal of the STAGGERED TEST BASIS scheduling requirement does not change the "specified test interval" or requirement to verify the OPERABLILITY of each fan every 92 days, but rather removes the requirement to schedule "the subinterval testing every 46 days." The proposed Surveillance Frequency of 92 days will be relocated to the Surveillance Frequency Control Program as justified in discussion of change (DOC) LA02.

SQN proposes to adopt this change 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 (DOC L02, page 472-473 of Enclosure 2, Volume 11), because the intervals between performances of the Surveillances for the two fans can be larger or smaller under the ITS than under the CTS, however, both must be tested within the specified test Frequency of 92 days.

Response

Date/Time	**8/8/2014 10:45 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/8/2014 9:41 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**297**
NRC Question Number	**CSS-038**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:15 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**143**
NRC Question Number	**CSS-039**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.10**
DOC Number	**L-1**
JFD Number	
JFD Bases Number	
Page Number(s)	**436**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**1. Page 436, DOC L01 describes the change to the CTS as: CTS 4.6.1.8.b.3 requires each EGTS cleanup subsystem flow rate 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.} 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. The staff notes that the ISTS SR 3.6.13.3 surveillance test interval is "[18] months on a STAGGERED TEST BASIS." The brackets indicate insertion of plant-specific information. Extending the CTS 18 month interval for testing both trains to 36 months for testing both trains should be evaluated under the commitments for interval extension in the SFCP. Proposing interval extensions for STIs noted in [ ] is outside the scope of the staff conversion review. Please revise the ITS SR 3.6.10.3 to retain the CLB 18 month test interval. Extension of the frequency to 18 months on a STAGGERED TEST BASIS can be changed under the SFCP. If the SR 3.6.10.3 Frequency moved to the SFCP uses the definition STB, then the Frequency for SR 3.6.10.3 under CLB would be "9 months on a STAGGERED TEST BASIS."**
Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**

Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 10:33 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**251**
NRC Question Number	**CSS-039**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS-039_ITS3.6.10.pdf** (39KB)
Attachment 2	
Response Statement	**In response to CSS-039, the CTS markups for CTS 4.6.1.8.b.3 (ITS SR 3.6.10.5) will be revised to retain the CTS testing Frequency of 18 months (pages 426 and 430 of Enclosure 2, Volume 11). Discussion of change (DOC) L01(page 436) which justified the surveillance frequency change will be deleted, as well as, the associated DOC L01 indicators in the right hand margin. The Frequency that will be relocated to the Surveillance Frequency Control Program for ITS SR 3.6.10.5 will be 18 months.** **See Attachment 1 for draft changes associated with retaining the existing CTS frequency of 18 months for CTS SR 4.6.1.8.b.3 (ITS SR 3.6.10.5).**
Response Date/Time	**8/8/2014 8:10 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/8/2014 7:09 AM**
Date Modified	
Modified By	

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS ~~- CLEANUP SUBSYSTEM~~

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:

ACTION A With one EGTS train ~~cleanup subsystem~~ inoperable, restore the inoperable train ~~subsystem~~ 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

ACTION B

SURVEILLANCE REQUIREMENTS

LA01

4.6.1.8 Each EGTS train ~~cleanup subsystem~~ shall be demonstrated OPERABLE: LA02

In accordance with the Surveillance Frequency Control Program

L03

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. LA03 L04

~~on a STAGGERED TEST BASIS~~ ~~L01~~

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

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 $\pm$ 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 $\pm$ 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

EMERGENCY GAS TREATMENT SYSTEM - EGTS ~~- CLEANUP SUBSYSTEM~~

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:

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

~~on a STAGGERED TEST BASIS~~ ~~L01~~

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

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

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

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.

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.

<u>LESS RESTRICTIVE CHANGES</u>

~~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.~~

~~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.~~

Licensee Response/NRC Response/NRC Question Closure

Id	**298**
NRC Question Number	**CSS-039**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:19 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**144**
NRC Question Number	**CSS-040**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.10**
DOC Number	**L-4**
JFD Number	
JFD Bases Number	
Page Number(s)	**438**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**2. Page 438, DOC L04 and "TSTF-522" describe the changes to CTS as: 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. 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). [emphasis added] 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. [emphasis added] The staff notes that the reference to the approved license amendment to revise VFTP required filter testing to be in accordance with ASTM D3803-1989 did not change the 10 hour test interval. RG 1.52, Revision 3, Regulatory Position 6.1 changes the test interval to 15 minutes. The staff also notes that the model CLIIP application for TSTF-522 justifies the 15 minute test interval as a replacement for a 10 hour test interval.**

Please revise DOC L04 to be consistent with the model application for TSTF-522, Revision 0, including a statement addressing deviations from TSTF-522, Revision 0.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 10:34 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**331**
NRC Question Number	**CSS-040**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS-040 STB.pdf** (687KB)
Attachment 2	
Response Statement	**In response to CSS-040, discussion of change (DOC) L04, on page 438 of Enclosure 2, Volume 11, will be revised to include statements consistent with the model application for TSTF-522, Revision 0 as it pertains to ITS 3.6.10, Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem. Specifically, DOC L04 will be revised to state:**

> **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.**
>
> **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.**

See Attachment 1 for draft changes associated with ITS 3.6.10. DOC L04.

NOTE: See the response to RAI CSS-041 concerning the change to the title of ITS 3.6.10, Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem.

Response Date/Time	**9/10/2014 5:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott** **Caroline Tilton**
Added By	**Lynn Mynatt**
Date Added	**9/10/2014 4:46 PM**
Date Modified	
Modified By	

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

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.

~~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

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.

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.

Licensee Response/NRC Response/NRC Question Closure

Id	**344**
NRC Question Number	**CSS-040**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**9/22/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**9/22/2014 3:02 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**145**
NRC Question Number	**CSS-041**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.10**
DOC Number	
JFD Number	
JFD Bases Number	**2**
Page Number(s)	**447**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**3. Page 447, JFD 2, Insert 1 describes the changes ISTS Bases as: 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 air cleanup subsystem is actuated following a LOCA to maintain a negative pressure in the annulus 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. [emphasis added] The staff notes that the emphasized test above is in the Bases Background section and represents a TS interpretation of what equipment is required to be operable for ITS LCO 3.6.10. This is contrary to the content of Background Bases and the LCO bases (Page 448) which states: 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. Please revise Insert 1 to delete "The air cleanup subsystem is the portion of EGTS that performs a safety function and is required to be OPERABLE."**
Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	
Modified By	
Date Added	**6/6/2014 10:37 AM**
Notification	**Khadijah Hemphill**

Andrew Hon
Lynn Mynatt
Lisa Regner
Ray Schiele
Carl Schulten
Roger Scott

Licensee Response/NRC Response/NRC Question Closure

Id	**267**
NRC Question Number	**CSS-041**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS-041 ITS 3.6.10.pdf** (446KB)
Attachment 2	**Attachment 2 FSAR Section 6.2.3.2.2.pdf** (75KB)

Response Statement

In response to CSS-041, the following information is provided regarding Insert 1 of the ITS 3.6.10 Bases Background Section.

Insert 1 addresses the distinction between the two subsystems that support each train of the Emergency Gas Treatment System (EGTS). The first subsystem, the annulus vacuum control subsystem, is not safety related and does not provide a support function during the design basis loss of coolant accident (LOCA). The second subsystem, the air cleanup subsystem, is the credited subsystem during the design basis LOCA. The insert is not an interpretation of the equipment required to be OPERABLE, but rather a change to the ISTS Bases Background Section reflecting the SQN current licensing basis as described in SQN UFSAR Section 6.2.3.2.2. Therefore, Insert 1 is correct as written.

In addition, based on discussions between SQN and the NRC Staff at a public meeting held on June 25, 2014, SQN will revise ITS 3.6.10 to reflect both the CTS system name/description and the corresponding ITS requirement for trains. Specifically, ITS 3.6.10 will be retitled, “Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem and ITS LCO 3.6.10 will be revised to state, “Two EGTS Air Cleanup Subsystem trains shall be OPERABLE." Corresponding changes will be required for all references to EGTS. Additionally, ITS 3.6.7, Shield Building and ITS 5.5.9, Ventilation Filter Testing Program, will be revised to reflect the changes associated with the above discussion. This will affect the CTS and ISTS markups, as well as, the associated discussion of changes (DOCs) and justification for deviations (JFDs).

See Attachment 1 for the draft revised ITS 3.6.7, ITS 3.6.10 and ITS 5.5.9 (CTS markups, DOCs, ISTS markups, JFDs, ISTS Bases markups and Bases JFDs) reflecting the above described changes.

See Attachment 2 for a copy of SQN UFSAR Section 6.2.3.2.2 regarding Insert 1 of the ITS 3.6.10 Bases Background Section.

NOTE: See the response to RAI CSS-039 concerning the deletion of ITS 3.6.10 DOC L01 and the associated deletion of the insert “on a STAGGERED TEST BASIS” on the CTS markups for CTS 4.6.1.8.b.3.

Response Date/Time	**8/20/2014 5:00 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/20/2014 3:54 AM**
Date Modified	
Modified By	

LIST OF ATTACHMENTS

DISCUSSION OF CHANGES
ITS 3.6.7, SHIELD BUILDING

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 3.6.1.7 does not provide an ACTION to take if the shield building is inoperable while in MODE 1, 2, 3, or 4; it only includes a requirement that the shield building 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 3.6.1.7 is not met while in MODE 1, 2, 3, or 4. CTS 3.0.3 requires action to be initiated within 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. When the shield building is inoperable and not restored to an OPERABLE status within the specified Completion Time (see DOC L01), ITS 3.6.7 ACTION B requires the unit 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 3.6.1.7 is silent on these actions, deferring to CTS 3.0.3 for the actions. This change is acceptable because the ACTIONS specified in ITS 3.6.7 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 3.6.1.7 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 3.6.7. This change is designated as administrative, because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 ITS SR 3.6.7.1 requires verification that annulus negative pressure is greater than 5 inches water gauge every 12 hours. ITS SR 3.6.7.2 requires verification that the shield building access door in each access opening is closed every 31 days. CTS 3.6.1.7 does not contain these Surveillance Requirements. This changes the CTS by adding new Surveillance Requirements to verify annulus negative pressure is within limits and to verify the shield building access door in each access opening is closed. (See DOC LA03 for moving the "12 hour" and "31 day" Frequencies for these Surveillance Requirements to the Surveillance Frequency Control Program.)

DISCUSSION OF CHANGES
ITS 3.6.7, SHIELD BUILDING

Air Cleanup Subsystem

The shield building surrounds the containment vessel and forms an annulus between the containment vessel and the inner wall of the shield building. This annular space collects containment leakage that may occur following a loss of coolant accident. A negative pressure is maintained in the annulus between the shield building and the steel containment vessel by the Emergency Gas Treatment System (EGTS). The release of radioactive contaminants to the environment is controlled via filters in the EGTS trains. The purpose of CTS 3.6.1.7 is to ensure the shield building is OPERABLE in MODES 1, 2, 3, and 4 to ensure the release of radioactive material from the containment atmosphere is restricted to the leakage paths assumed in the accident analysis. Since shield building access door position and annulus pressure are integral to shield building OPERABILITY, ITS 3.6.7 adds a specific Surveillance Requirement (ITS SR 3.6.7.1) to verify every 12 hours that annulus negative pressure is within the limit assumed in the containment analysis. Additionally, a specific Surveillance Requirement (ITS SR 3.6.7.2) is added to verify every 31 days that the door in each access opening is closed, so that the shield building boundary is not breached at any time when the shield building boundary is required. This change is designated as more restrictive because new Surveillance Requirements have been added to ensure the shield building OPERABILITY is maintained.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.6.1.7 requires that the structural integrity of the shield building be maintained at a level consistent with the acceptance criteria in CTS 4.6.1.7. CTS 4.6.1.7 requires the structural integrity of the shield building to be determined by a visual inspection of the exposed shield building interior and exterior surfaces and verifying no apparent changes in concrete surface appearance or other abnormal degradation. ITS LCO 3.6.7 requires the shield building to be OPERABLE. This changes the CTS by moving the detail of what constitutes shield building OPERABILITY to the Bases.

The removal of these 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 retains the requirements that the shield building be OPERABLE. 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.

DISCUSSION OF CHANGES
ITS 3.6.7, SHIELD BUILDING

LA02 *(Type 4 – Removal of LCO, SR, or other TS Requirements to the TRM, UFSAR, ODCM, NQAP, CLRT Program, IST Program, or ISI Program)* CTS 4.6.1.7 requires the structural integrity of the shield building to be determined by a visual inspection of the exposed shield building interior and exterior surfaces and verifying no apparent changes in concrete surface appearance or other abnormal degradation. ITS SR 3.6.7.3 includes the shield building structural integrity visual inspection verification of exposed interior and exterior surfaces, but does not include the details of what the inspection entails. This changes the CTS by moving the details of the shield building inspection to the TS Bases.

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 integrity of the shield building. 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.

LA03 *(Type 5 – Removal of SR Frequency to the Surveillance Frequency Control Program)* CTS 4.6.1.8.d.4 requires verification that each Emergency Gas Treatment System Air Cleanup Subsystem produces a negative pressure within limits in the annulus within 1 minute after a start signal. ITS SR 3.6.7.4 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 change of the requirement to perform the Surveillances ON A STAGGERED TEST BASIS is discussed in DOC L02). Additionally, ITS SR 3.6.7.1 has been added to verify the annulus negative pressure is within limits every 12 hours, and ITS SR 3.6.7.2 has been added to verify the shield building access door in each access opening is closed every 31 days. (See DOC M01 for the discussion on adding these SRs.) The "12 hour" and "31 day" Frequencies for these Surveillances have 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

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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.

Air Cleanup Subsystem

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.

Air Cleanup Subsystem

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.

Air Cleanup Subsystem

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CTS

Shield Building ~~(Dual and Ice Condenser)~~ 1
3.6.~~8~~ 7

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY
DOC M01	SR 3.6.~~8~~.2 7	Verify ~~one~~ the shield building access door in each access opening is closed.	~~[31 days~~ 1 6 5 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 5
4.6.1.7	SR 3.6.~~8~~.3 7	~~[~~ 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 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 Air Cleanup Subsystem 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~~ 1 4 2 7 4 5 ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~ 5

CTS

Shield Building ~~(Dual and Ice Condenser)~~
3.6.~~8~~ 7 1

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
DOC M01	SR 3.6.~~8~~.2 7	Verify ~~one~~ the shield building access door in each access opening is closed.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	1 6 5 5
4.6.1.7	SR 3.6.~~8~~.3 7	~~[~~ 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 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 ~~Air Cleanup Subsystem~~ 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 5

Air Cleanup Subsystem

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 access door is open for normal transit entry and exit, thereby requiring entry into Condition A. Therefore, an exception to the requirement that the access opening doors 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 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.

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 provide two options for controlling the Frequencies of Surveillance Requirements. SQN is proposing to control the Surveillance Frequencies 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 shield building access opening. Therefore, the Surveillance is changed to verify "the" shield building access door in each access opening closed, thereby reflecting the plant-specific design.

7. 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.

Air Cleanup Subsystem

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B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~8~~ 7 Shield Building ~~(Dual and Ice Condenser)~~ 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.

Air Cleanup Subsystem

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.

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

LCO

Air Cleanup Subsystem

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~8~~ 7.4

The ~~Shield Building Air Cleanup System~~ EGTS produces a negative pressure to prevent leakage from the building. SR 3.6.~~8~~ 7.4 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~~ 7.4, 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.~~
~~--]~~

Air Cleanup Subsystem

Air Cleanup Subsystem

REFERENCES None.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.~~8~~ 7 Shield Building ~~(Dual and Ice Condenser)~~ 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.

Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem

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.

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

LCO

Air Cleanup Subsystem

Shield building OPERABILITY must be maintained to ensure proper operation of the ~~SBACS~~ EGTS 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.~~8~~.4 7 1

Air Cleanup Subsystem

The ~~Shield Building Air Cleanup System~~ EGTS produces a negative pressure to prevent leakage from the building. SR 3.6.~~8~~.4 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, 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.~~ 7 2 1 4 1 7 4 60 2 2 5 2 5

Air Cleanup Subsystem

~~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.

ATTACHMENT 10

Air Cleanup Subsystem

ITS 3.6.10, EMERGENCY GAS TREATMENT SYSTEM (EGTS)

ITS

A01

ITS 3.6.10

CONTAINMENT SYSTEMS

EMERGENCY GAS TREATMENT SYSTEM - EGTS ~~- CLEANUP SUBSYSTEM~~

Air Cleanup Subsystem

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

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

L03

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. LA03 L04

~~on a STAGGERED TEST BASIS~~ ~~L01~~

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

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 $\pm$ 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 $\pm$ 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

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

LA02

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

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 ~~a Phase A containment isolation Test~~ an actual or simulated Signal. L02 LA01

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

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. See ITS 3.6.7

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

ITS

A01

~~ITS~~ 3.6.10

CONTAINMENT SYSTEMS

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

LIMITING CONDITION FOR OPERATION

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

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

ACTION:

ACTION A — With one ~~EGTS~~ ~~cleanup subsystem~~ EGTS Air Cleanup Subsystem train inoperable, restore the inoperable ~~subsystem~~ train to OPERABLE status within 7 days LA01

ACTION B — or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

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

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

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 ~~a~~ an actual or simulated ~~Phase A containment isolation Test~~ Signal. L02 LA01

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

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. See ITS 3.6.7

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

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

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

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.

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

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.

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.~~

~~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.~~

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

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~~ 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. EGTS Air Cleanup Subsystem

The purpose of CTS 4.6.1.8.d.2 is to ensure the ~~EGTS~~ 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~~ 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.

EGTS Air Cleanup Subsystem

The purpose of CTS 4.8.1.8.a is to ensure each ~~EGTS~~ 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

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.

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

3.6 CONTAINMENT SYSTEMS

Emergency Gas Treatment System (EGTS)

3.6.~~13~~ 10 ~~Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser)~~ Air Cleanup Subsystem

3.6.1.8 LCO 3.6.~~13~~ 10 Two ~~SBACS~~ EGTS trains shall be OPERABLE.

EGTS Air Cleanup Subsystem

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

~~ACTIONS~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
Action A. One ~~SBACS~~ EGTS train inoperable.	A.1 Restore ~~SBACS~~ EGTS train to OPERABLE status.	7 days
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~~ 10.1 Operate each ~~SBACS~~ EGTS train for [≥ ~~10~~ 15 continuous ~~hours~~ minutes [with heaters operating ~~or (for systems without heaters) ≥ 15 minutes]~~.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program]
DOC A02 SR 3.6.~~13~~ 10.2 Perform required ~~SBACS~~ EGTS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

EGTS Air Cleanup Subsystem

CTS

~~SBACS (Dual and Ice Condenser)~~ EGTS

EGTS Air Cleanup Subsystem

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~~ ~~OR~~ 1 4 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~~ ~~OR~~ 1 3 4 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~~ ~~OR~~ 3 1 4 In accordance with the Surveillance Frequency Control Program ~~]~~ 4

CTS

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

3.6.~~13~~ 10 1

3.6 CONTAINMENT SYSTEMS

Emergency Gas Treatment System (EGTS)

3.6.~~13~~ 10 ~~Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser)~~ Air Cleanup Subsystem 1

3.6.1.8 LCO 3.6.~~13~~ 10 Two ~~SBACS~~ EGTS trains shall be OPERABLE.

EGTS Air Cleanup Subsystem

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

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~~ 10.1 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~~ 3 In accordance with the Surveillance Frequency Control Program ~~]~~ 4	TSTF-522
DOC A02	SR 3.6.~~13~~ 10.2 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

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

3.6.~~13~~ 10

1

SURVEILLANCE REQUIREMENTS (continued)

	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 ~~]~~	3 1 4 4

EGTS Air Cleanup Subsystem

Air Cleanup Subsystem

JUSTIFICATION FOR DEVIATIONS
ITS 3.6.10, 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 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.

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

EGTS Air Cleanup Subsystem ~~SBACS (Dual and Ice Condenser)~~ EGTS
B 3.6.~~13~~ 10
1

B 3.6 CONTAINMENT SYSTEMS

Emergency Gas Treatment System (EGTS) Air Cleanup Subsystem

B 3.6.~~13~~ ~~Shield Building Air Cleanup System (SBACS) (Dual and Ice Condenser)~~ 1
10

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**

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 air cleanup subsystem is actuated following a LOCA to maintain a negative pressure in the annulus 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.

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.~~

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

APPLICABLE SAFETY ANALYSES

The ~~SBACS~~ EGTS Air Cleanup Subsystem 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~~ EGTS Air Cleanup Subsystem 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.

The modeled ~~SBACS~~ EGTS Air Cleanup Subsystem actuation in the safety analyses is based upon a worst case response time following ~~an SI~~ a Phase A containment isolation 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~~ 60 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.

The ~~SBACS~~ EGTS Air Cleanup Subsystem satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

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

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~~ EGTS Air Cleanup Subsystem train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs. 1

B.1 and B.2

~~EGTS~~ EGTS Air Cleanup Subsystem 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.

SURVEILLANCE REQUIREMENTS

SR 3.6.~~13~~ 10 .1 1 2 5

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.~~ TSTF-522 ~~[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.~~ 6

2 **INSERT 2**

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

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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

SR 3.6.~~13~~ 10 .2 1

This SR verifies that the required ~~SBACS~~ EGTS Air Cleanup Subsystem 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.~~13~~ 10 .3 1

The automatic startup ensures that each ~~SBACS~~ EGTS Air Cleanup Subsystem 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.

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~~ 10 .4

1

The ~~SBACS~~ EGTS (EGTS Air Cleanup Subsystem) filter cooling bypass ~~dampers~~ valves 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

SR 3.6.~~13~~ 10 .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.~~
~~---]~~ 7

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

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 1

BASES ~~EGTS~~ EGTS Air Cleanup Subsystem

BACKGROUND

The ~~SBACS~~ EGTS 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.

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~~ EGTS Air Cleanup Subsystem. 1

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. 3 4

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**

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 air cleanup subsystem is actuated following a LOCA to maintain a negative pressure in the annulus 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.

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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

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

APPLICABLE SAFETY ANALYSES

The ~~SBACS~~ EGTS Air Cleanup Subsystem 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~~ EGTS Air Cleanup Subsystem 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~~

The modeled ~~SBACS~~ EGTS Air Cleanup Subsystem actuation in the safety analyses is based upon a worst case response time following ~~an SI~~ a Phase A containment isolation 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~~ 60 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

The ~~SBACS~~ EGTS Air Cleanup Subsystem satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). 1

LCO

In the event of a DBA, one ~~SBACS~~ EGTS Air Cleanup Subsystem train is required to provide the minimum particulate iodine removal assumed in the safety analysis. Two trains of the ~~SBACS~~ EGTS Air Cleanup Subsystem 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~~ 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~~ ~~EGTS~~ train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs. 1

B.1 and B.2

EGTS Air Cleanup Subsystem ~~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.

SURVEILLANCE REQUIREMENTS

SR 3.6.~~13~~ 10 .1

EGTS Air Cleanup Subsystem ~~EGTS~~ INSERT 2 1 2 5

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.~~ TSTF-522 ~~[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.~~ 6

2 **INSERT 2**

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~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.~~13~~ 10 .2

This SR verifies that the required ~~SBACS~~ EGTS Air Cleanup Subsystem 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.~~13~~ 10 .3

The automatic startup ensures that each ~~SBACS~~ EGTS Air Cleanup Subsystem 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.~~

~~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.~~
~~-----]~~ 7

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

The ~~SBACS~~ EGTS filter cooling bypass ~~dampers~~ valves 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

SR 3.6.~~13~~ 10 .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.~~
~~--]~~ 7

REFERENCES

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

Air Cleanup Subsystem

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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Air Cleanup
Subsystem

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

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

5.5 Programs and Manuals

5.5.~~11~~ 9 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems ~~at the frequencies specified in [Regulatory Guide], and~~ in accordance with Regulatory Positions C.5.a, C.5.c, C.5.d and C.6.b of ~~[~~Regulatory Guide 1.52, Revision 2, ~~ASME N510-1989,~~ ANSI N510-1975 and ~~AG-1~~ ASTM D3803-1989~~]~~.

INSERT 4

4.6.1.8.e 4.7.7.c.3 4.7.7.f 4.7.8.b.3 4.7.8.e 4.9.12.b.3 4.9.12.e 4.6.1.8.b.1 4.7.7.c.1 4.7.8.b.1 4.9.12.b.1

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a ~~penetration and system bypass < [0.05]%~~ removal efficiency of ≥ 99.95% of dioctyl phthalate (DOP) when tested in accordance with Regulatory Positions C.5.a and C.5.c of ~~[~~Regulatory Guide 1.52, Revision 2, and ~~ASME N510-1989]~~ ANSI N510-1975 (except for the provisions of Sections 8 and 9) at the system flowrate specified below ~~[~~± 10%~~]~~.

~~ESF Ventilation System~~	~~Flowrate~~
~~[ ]~~	~~[ ]~~

INSERT 5

4.6.1.8.f 4.7.7.c.3 4.7.7.g 4.7.8.b.3 4.7.8.f 4.9.12.b.3 4.9.12.f

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a ~~penetration and system bypass < [0.05]%~~ removal efficiency of ≥ 99.95% of a halogenated hydrocarbon refrigerant test gas when tested in accordance with Regulatory Positions C.5.a and C.5.d of ~~[~~Regulatory Guide 1.52, Revision 2, and ~~ASME N510-1989]~~ ANSI N510-1975 (except for the provisions of Sections 8 and 9) at the system flowrate specified below ~~[~~± 10%~~]~~.

~~ESF Ventilation System~~	~~Flowrate~~
~~[ ]~~	~~[ ]~~

INSERT 6

4.6.1.8.b.2 4.6.1.8.c 4.7.7.c..2 4.7.7.d 4.7.8.b.2 4.7.8.c 4.9.12.b.2 4.9.12.c

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Position C.6.b of ~~[~~Regulatory Guide 1.52, Revision 2~~]~~, shows the methyl iodide penetration ~~less than the value specified below~~ < 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and the relative humidity ~~specified below~~ of 70%.

ESF Ventilation System	~~Penetration~~	~~RH~~	~~Face Velocity (fps)~~
~~[ ]~~ EGTS ABGTS CREVS	~~[See Reviewer's Note]~~	~~[See Reviewer's Note]~~	~~[See Reviewer's Note]~~

Air Cleanup Subsystem

~~REVIEWER'S NOTE~~

~~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, the ability of the charcoal filters to perform in a manner consistent with the licensing basis for the facility is indeterminate.~~

3 INSERT 4

4.6.1.8.b
4.6.1.8.e
4.6.1.8.f
4.7.7.f
4.7.7.g
4.7.8.e
4.7.8.f

The test described in Specification 5.5.9.a and 5.5.9.b shall be performed once per 18 months; after any structural maintenance on the high efficiency particulate air (HEPA) filter bank or charcoal adsorber bank housing; following painting, fire, or chemical release in any ventilation zone communicating with the system; and after each complete or partial replacement of a HEPA filter bank or charcoal adsorber bank.

4.6.1.8.c
4.6.1.8.b
4.7.7.c
4.7.7.d
4.7.8.b
4.7.8.c
4.9.12.b
4.9.12.c

The test described in Specification 5.5.9.c shall be performed once per 18 months or after 720 hours of filter operation; after any structural maintenance on the HEPA filter bank or charcoal adsorber bank housing; and following painting, fire, or chemical release in any ventilation zone communicating with the system.

4.6.1.8.d
4.7.7.e
4.7.8.d
4.9.12.d

The test described in Specification 5.5.9.d and 5.5.9.e shall be performed once per 18 months.

3 INSERT 5

Air Cleanup Subsystem

ESF Ventilation System	Flow Rate (cfm)
Emergency Gas Treatment System (EGTS)	4000
Auxiliary Building Gas Treatment System (ABGTS)	9000
Control Room Emergency Ventilation System (CREVS)	4000

3 INSERT 6

ESF Ventilation System	Flow Rate (cfm)
EGTS Air Cleanup Subsystem	4000
ABGTS	9000
CREVS	4000

5.5 Programs and Manuals

5.5.~~11~~ 9 Ventilation Filter Testing Program (continued) 4

~~ASTM D 3803-1989 is a more stringent testing standard because it does not differentiate between used and new charcoal, it has a longer equilibration period performed at a temperature of 30°C (86°F) and a relative humidity (RH) of 95% (or 70% RH with humidity control), and it has more stringent tolerances that improve repeatability of the test.~~

~~Allowable Penetration = [(100% - Methyl Iodide Efficiency * for Charcoal Credited in Licensee's Accident Analysis) / Safety Factor]~~

~~When ASTM D3803-1989 is used with 30°C (86°F) and 95% RH (or 70% RH with humidity control) is used, the staff will accept the following:~~

~~Safety factor ≥ 2 for systems with or without humidity control.~~

~~Humidity control can be provided by heaters or an NRC-approved analysis that demonstrates that the air entering the charcoal will be maintained less than or equal to 70 percent RH under worst-case design-basis conditions.~~

~~If the system has a face velocity greater than 110 percent of 0.203 m/s (40 ft/min), the face velocity should be specified.~~

~~*This value should be the efficiency that was incorporated in the licensee's accident analysis which was reviewed and approved by the staff in a safety evaluation.~~ 5

4.6.1.8.d.1
4.7.7.e.1
4.7.8.b.3
4.7.8.d.1
4.9.12.b.3
4.9.12.d.1
4.7.7.c.3

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, ~~the prefilters,~~ and the charcoal adsorbers is less than the value specified below when tested in accordance with ~~[~~Regulatory Guide 1.52, Revision 2, and ASME N510-~~1989]~~ 1975 at the system flowrate specified below ~~[~~± 10%~~]~~. 3 2

~~ESF Ventilation System~~ ~~Delta P~~ ~~Flowrate~~ INSERT 7 3

~~[ ]~~ ~~[ ]~~ ~~[ ]~~

4.7.8.d.4
4.9.12.d.3

~~[~~ e. Demonstrate that the heaters for ~~each of~~ the ESF system~~s~~ dissipate the value specified below ~~[~~± 10%~~]~~ when tested in accordance with ~~[ASME N510-1989]~~ ANSI N510-1975.

ESF Ventilation System	Wattage ~~]~~
~~[ ]~~ Auxiliary Building Gas Treatment System	~~[ ]~~ 32 kW

2

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the VFTP test frequencies.

3 **INSERT 7**

ESF Ventilation System	Combined Delta P (inches water gauge)	Flowrate (cfm)
Air Cleanup Subsystem		
EGTS	5	4000
ABGTS	3	9000
CREVS	3	4000

5.5 Programs and Manuals

5.5.~~11~~ 9 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems ~~at the frequencies specified in [Regulatory Guide], and~~ in accordance with ~~[~~Regulatory Positions C.5.a, C.5.c, C.5.d and C.6.b of Regulatory Guide 1.52, Revision 2, ~~ASME N510-1989,~~ ANSI N510-1975 and ~~AG-1~~ ASTM D3803-1989~~]~~.

INSERT 4

4.6.1.8.e 4.7.7.c.3 4.7.7.f 4.7.8.b.3 4.7.8.e 4.9.12.b.3 4.9.12.e 4.6.1.8.b.1 4.7.7.c.1 4.7.8.b.1 4.9.12.b.1

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a ~~penetration and system bypass < [0.05]%~~ removal efficiency of ≥ 99.95% of dioctyl phthalate (DOP) when tested in accordance with ~~[~~Regulatory Positions C.5.a and C.5.c of Regulatory Guide 1.52, Revision 2, and ~~ASME N510-1989]~~ ANSI N510-1975 (except for the provisions of Sections 8 and 9) at the system flowrate specified below ~~[~~± 10%~~]~~.

~~ESF Ventilation System~~	~~Flowrate~~
~~[ ]~~	~~[ ]~~ INSERT 5

4.6.1.8.f 4.7.7.c.3 4.7.7.g 4.7.8.b.3 4.7.8.f 4.9.12.b.3 4.9.12.f

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a ~~penetration and system bypass < [0.05]%~~ removal efficiency of ≥ 99.95% of a halogenated hydrocarbon refrigerant test gas when tested in accordance with ~~[~~Regulatory Positions C.5.a and C.5.d of Regulatory Guide 1.52, Revision 2, and ~~ASME N510-1989]~~ ANSI N510-1975 (except for the provisions of Sections 8 and 9) at the system flowrate specified below ~~[~~± 10%~~]~~.

~~ESF Ventilation System~~	~~Flowrate~~
~~[ ]~~	~~[ ]~~ INSERT 6

4.6.1.8.b.2 4.6.1.8.c 4.7.7.c..2 4.7.7.d 4.7.8.b.2 4.7.8.c 4.9.12.b.2 4.9.12.c

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in ~~[~~Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2~~]~~, shows the methyl iodide penetration ~~less than the value specified below~~ < 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and the relative humidity ~~specified below~~ of 70%.

ESF Ventilation System	~~Penetration~~	~~RH~~	~~Face Velocity (fps)~~
~~[ ]~~ EGTS ABGTS CREVS Air Cleanup Subsystem	~~[See Reviewer's Note]~~	~~[See Reviewer's Note]~~	~~[See Reviewer's Note]~~

~~REVIEWER'S NOTE~~

~~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, the ability of the charcoal filters to perform in a manner consistent with the licensing basis for the facility is indeterminate.~~

3 **INSERT 4**

4.6.1.8.b 4.6.1.8.e 4.6.1.8.f 4.7.7.f 4.7.7.g 4.7.8.e 4.7.8.f

The test described in Specification 5.5.9.a and 5.5.9.b shall be performed once per 18 months; after any structural maintenance on the high efficiency particulate air (HEPA) filter bank or charcoal adsorber bank housing; following painting, fire, or chemical release in any ventilation zone communicating with the system; and after each complete or partial replacement of a HEPA filter bank or charcoal adsorber bank.

4.6.1.8.c 4.6.1.8.b 4.7.7.c 4.7.7.d 4.7.8.b 4.7.8.c 4.9.12.b 4.9.12.c

The test described in Specification 5.5.9.c shall be performed once per 18 months or after 720 hours of filter operation; after any structural maintenance on the HEPA filter bank or charcoal adsorber bank housing; and following painting, fire, or chemical release in any ventilation zone communicating with the system.

4.6.1.8.d 4.7.7.e 4.7.8.d 4.9.12.d

The test described in Specification 5.5.9.d and 5.5.9.e shall be performed once per 18 months.

3 **INSERT 5**

Air Cleanup Subsystem

ESF Ventilation System	Flow Rate (cfm)
Emergency Gas Treatment System (EGTS)	4000
Auxiliary Building Gas Treatment System (ABGTS)	9000
Control Room Emergency Ventilation System (CREVS)	4000

3 **INSERT 6**

ESF Ventilation System	Flow Rate (cfm)
EGTS	4000
ABGTS	9000
CREVS	4000

Air Cleanup Subsystem

5.5 Programs and Manuals

5.5.~~11~~ 9 Ventilation Filter Testing Program (continued) 4

~~ASTM D 3803-1989 is a more stringent testing standard because it does not differentiate between used and new charcoal, it has a longer equilibration period performed at a temperature of 30°C (86°F) and a relative humidity (RH) of 95% (or 70% RH with humidity control), and it has more stringent tolerances that improve repeatability of the test.~~

~~Allowable Penetration = [(100% - Methyl Iodide Efficiency * for Charcoal Credited in Licensee's Accident Analysis) / Safety Factor]~~

~~When ASTM D3803-1989 is used with 30°C (86°F) and 95% RH (or 70% RH with humidity control) is used, the staff will accept the following:~~

~~Safety factor ≥ 2 for systems with or without humidity control.~~ 5

~~Humidity control can be provided by heaters or an NRC-approved analysis that demonstrates that the air entering the charcoal will be maintained less than or equal to 70 percent RH under worst-case design-basis conditions.~~

~~If the system has a face velocity greater than 110 percent of 0.203 m/s (40 ft/min), the face velocity should be specified.~~

~~*This value should be the efficiency that was incorporated in the licensee's accident analysis which was reviewed and approved by the staff in a safety evaluation.~~

4.6.1.8.d.1
4.7.7.e.1
4.7.8.b.3
4.7.8.d.1
4.9.12.b.3
4.9.12.d.1
4.7.7.c.3

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, ~~the prefilters,~~ and the charcoal adsorbers is less than the value specified below when tested in accordance with ~~[~~Regulatory Guide 1.52, Revision 2, and ASME N510-~~1989]~~ 1975 at the system flowrate specified below ~~[~~± 10%~~]~~. 3 2

~~ESF Ventilation System~~	~~Delta P~~	~~Flowrate~~
~~[ ]~~	~~[ ]~~	~~[ ]~~

INSERT 7 3

4.7.8.d.4
4.9.12.d.3

~~[~~ e. Demonstrate that the heaters for ~~each of~~ the ESF system~~s~~ dissipate the value specified below ~~[~~± 10%~~]~~ when tested in accordance with ~~[ASME N510-1989]~~ ANSI N510-1975.

ESF Ventilation System	Wattage ~~]~~
~~[ ]~~ Auxiliary Building Gas Treatment System	~~[ ]~~ 32 kW

2

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the VFTP test frequencies.

3 **INSERT 7**

ESF Ventilation System	Combined Delta P (inches water gauge)	Flowrate (cfm)
Air Cleanup Subsystem		
EGTS	5	4000
ABGTS	3	9000
CREVS	3	4000

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6.2.3.1.4 Ice Condenser Design Basis (Cleanup Function)

The design basis of the ice condenser as an Iodine Removal System is to use the chemical and physical properties of ice to reduce the fission product iodine concentration in the post LOCA containment atmosphere. See Appendix 6A for a discussion of the mechanics of the iodine removal process.

6.2.3.2 System Design

6.2.3.2.1 Containment Spray Trains

See Paragraph 6.2.2.2.

6.2.3.2.2 Emergency Gas Treatment System

The Emergency Gas Treatment System is shown schematically in Figure 9.4.7-1. This system has two subsystems; the Annulus Vacuum Control Subsystem and the Air Cleanup Subsystem.

Annulus Vacuum Control Subsystem

The Annulus Vacuum Control Subsystem is a fan, duct, and control network used to establish and maintain a negative pressure within the annulus. It is utilized during normal operations in which containment integrity is required. In emergencies in which containment isolation is required, this subsystem is isolated and shutdown. This subsystem performs no safety related function and, therefore, is not classified as an engineered safety feature.

This subsystem has an independently controlled branch for each reactor unit. The air inlet for each branch is centrally located in the secondary containment annulus above the steel containment dome. The fans discharge into the fuel handling area exhaust system to the Auxiliary Building exhaust vent.

Air pressure control in each secondary containment annulus is achieved with redundant fans, differential pressure sensors, air operated dampers, and control circuitry. This equipment provides a capability to vary the volumetric flow rate drawn from the annulus to keep the pressure at a predetermined negative pressure level. This control function is accomplished with a modulating damper under control of a differential pressure sensor that adjusts the amount of relief air introduced upstream of a constant capacity fan. Two relief air intake lines with modulating dampers and controllers are provided for each unit. One serves as a backup in the event the other fails to function in the proper manner.

The fans and flow control dampers serving both reactor secondary containment annuli are installed in the EGTS room at elevation 734 adjacent to the unit 2 Shield Building.

The nominal setpoint for each annulus vacuum control equipment installation is five inches of water below reference pressure in the Auxiliary Building. The fans employed to create such a negative pressure are described in Table 6.2.1-2.

Air Cleanup Subsystem

The Air Cleanup Subsystem is a redundant shared airflow network having the capability to perform two functions for the affected reactor secondary containment during a LOCA. One of

these is to keep the secondary containment annulus air volume below atmospheric pressure. The second function is to remove airborne particulates and vapors from air drawn from the annulus that may contain radioactive nuclides.

Both of these functions are performed by processing and controlling a stream of air taken from the affected reactor unit secondary containment annulus. The air cleanup operation is conducted by drawing the air stream through a series of filters and adsorbers. Annulus air pressure control is accomplished by adjusting the fraction of the airstream that is returned to the annulus air space.

The rated capacity of each redundant air cleanup unit in the subsystem is 4000 cfm. These were designed in accordance with engineered safety feature standards.

The air flow network for the Air Cleanup Subsystem was designed to provide the redundant services needed for either reactor secondary containment annulus. The intakes and ducting in this network used to bring annulus air to the Emergency Gas Treatment System room on Elevation 734 in the Auxiliary Building are those also used by the Annulus Vacuum Control Subsystem. The intake is centrally located within each Shield Building above the steel containment dome. Within the Emergency Gas Treatment System room the network branches out to supply two air cleanup unit installations that can be aligned with flow control valves to serve either annulus air volume. After the air is processed, the Air Cleanup Subsystem air flow network directs the air to redundant damper controlled flow dividers in the affected reactor unit annulus where the flow is divided for discharge to the shield building vent and to a manifold that distributes and releases the air uniformly around the bottom of the annulus. Butterfly valves, rather than dampers, are installed in the ducts to minimize the outside air in-leakage from the shield building vent into the annulus.

Another feature incorporated into the Air Cleanup Subsystem air flow network is the capability to cool the filters and adsorbers in an inactive air cleanup unit that is loaded with radioactive material. This is accomplished with two cross-over air flow ducts that can draw air at approximately 200 cfm from the active air cleanup unit through the inactive air cleanup unit. This airflow is sufficient to keep the temperature in a fully loaded inactive air cleanup unit to less than 300° F. Two butterfly valves in series are installed in each cross-over air flow path to assure sufficient isolation to perform accurate removal efficiency tests on the HEPA filter and carbon adsorber banks.

The two air cleanup units in the Air Cleanup Subsystem are steel housings containing air treatment equipment, heaters, a drain, test fittings, and access facilities for maintenance. The air treatment equipment within the housing includes a moisture separator* relative humidity heater, prefilter bank, HEPA filter bank, two banks of carbon adsorbers in series and another HEPA filter bank. This equipment is installed in the order listed. A drain is incorporated into the housing adjacent to the moisture separator installation to allow moisture separated from the air stream to flow by gravity to a water collection tank in the Auxiliary Building. Integral to this housing are test fittings properly sized and positioned to permit orderly and efficient testing of the HEPA filter and carbon adsorber banks.

The relative humidity heater installed in the air cleanup units is an electric heater designed to heat the incoming air sufficiently to reduce the relative humidity of saturated air to 70 percent. Included in this installation is a temperature limiting controller that will shut the heater off if excessive temperatures are detected.

(*) See Table 6.2.3-1, Regulatory Guide 1.52 Section C.3.a for applicability requirements.

The HEPA filters and carbon adsorbers installed in the air cleanup units are standard items widely used in the nuclear power industry. The HEPA filters are 1000 cfm units designed to remove at least 99.97 percent of the particulates greater than 0.3 micron in diameter. These filters are water and fire resistant units fabricated in accordance with MIL-F-51068C. The carbon adsorbers are Type II unit trays, fabricated in accordance with AACC Standard CS-8. These trays contain 2-inch-thick impregnated carbon beds. These trays, rated at 333 cfm, are installed in banks in which the face velocity is less than 40 ft/min. Under such circumstances the residence time for air in the carbon bed is about 0.25 second. The total number of filters and adsorber unit trays provided in each air cleanup unit are listed in Table 6.2.1-2.

Two V-belt driven centrifugal fans are provided in the Air Cleanup Subsystem. Each of these is associated with a specific air cleanup unit. These fans were designed to function in process air flow streams at temperature up to 200°F. See Table 6.2.1-2 for additional information on these fans.

Two air flow control modules are included for each reactor unit in the Air Cleanup Subsystem. Each module consist of a differential pressure transmitter, controller, failure detection logic, a damper actuator, two discharge modulating dampers, and two isolation dampers (exhaust and recirculation). A single actuator (mechanical linkage) adjusts the discharge modulating dampers simultaneously in opposite directions - one is closed when the other is opened.

This air flow control equipment, installed in the secondary containment annuli, provides the capability to adjust the amount of air returned to the affected reactor unit annulus. A negative 0.5 inch of water gauge controller setpoint is used to adjust the amount of air returned to the affected annulus. Annulus pressures more positive than the controller pressure setpoint (-0.5"W.G) produce a signal causing the damper actuator to begin closing the damper controlling the air flow to the annulus and simultaneously start opening the damper controlling the air flow to the reactor unit vent. Annulus pressures more negative than the controller setpoint initiate the opposite kind of damper motions. The failure detection logic isolates the operating flow path isolation dampers and opens the standby flow path isolation dampers when the annulus pressure is not within setpoint values.

The controls for the Air Cleanup Subsystem were designed for two basic control modes. One mode of control has both air cleanup units in operation simultaneously. The second mode of control has either one of the units in operation and the other in a state in which it can automatically come into operation in the event that the operating unit fails under low flow condition (a Phase A containment isolation signal must be present). If a Phase A containment isolation signal is not present, the standby unit will start on low flow signal only by manual actuation. This operating redundancy is achieved with spatially separated power and control circuitry having different independent power sources to prevent a loss of function from any single subsystem component. Power for both trains of equipment is supplied by the Emergency Power System.

Operation of the Air Cleanup Subsystem during accidents is initiated by the Phase A Containment Isolation Signal. Both the A and the B trains will be started by this signal coming from either reactor unit. A capability is also provided to start both trains with hand switches in the main control room. Damper alignment and shield building vent isolation valve positioning is also initiated by the same signal, however, just those associated with the affected reactor unit will be activated. Another adjustment of a hand switch in the main control room will change the operating mode to the single train operation with the redundant train in a standby status.

Licensee Response/NRC Response/NRC Question Closure

Id	**299**
NRC Question Number	**CSS-041**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**8/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Caroline Tilton**
Date Added	**8/26/2014 9:47 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**141**
NRC Question Number	**CSS-042**
Category	**Technical**
ITS Section	**3.6**
ITS Number	**3.6.11**
DOC Number	**LA-1**
JFD Number	
JFD Bases Number	
Page Number(s)	**471**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**

NRC Question

1. Page 471, DOC LA01 describes the CTS change as:

> **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 to be OPERABLE, but does not include the details of what constitutes OPERABILITY [i.e., the independence requirement]. 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 Specification 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 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.**

Page 479, JFD 3 justifies deviating from the ISTS LCO requirement for "trains" to be operable:

> **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.**

The staff notes that the SQN CTS LCO 3.6.5.6 licensing basis requirement for the two containment air return fans to be "independent" is deleted. It would appear that SQN CTS LCO requirements should be translated into the ITS by replacing "trains" feature of the air return system (a design detail in the ISTS LCO) with "independence," the equivalent SQN

CTS design detail because the CTS LCO includes an operational restriction on aligning both containment air return fans to the same power supply. DOC LA01 in conjunction with JFD 3 do not establish a safety basis for not retaining CTS LCO requirements. This change is also a BSI because the SQN has an equivalent design feature to the ISTS ARS. Please revise the SQN ITS 3.6.11 LCO to retain CTS requirements for ARS fans to be independent.

Attach File 1	
Attach File 2	
Issue Date	**6/6/2014**
Added By	**Carl Schulten**
Date Modified	**6/6/2014 4:50 PM**
Modified By	**Ray Schiele**
Date Added	**6/6/2014 7:24 AM**
Notification	**Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Carl Schulten** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**219**
NRC Question Number	**CSS-042**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CSS-042 R1.pdf** (166KB)
Attachment 2	

Response Statement

In response to CSS-042, ITS LCO 3.6.11, on pages 475 and 477 of Enclosure 2, Volume 11, will be revised to state, "Two ARS [Air Return System] trains shall be OPERABLE." Additionally, the following changes will be necessary:

1. **The CTS markups will be revised to indicate the replacement of "containment air return fans" with the ITS nomenclature "air return system trains." A new discussion of change (DOC) A02 will be added to justify the replacement of "fans" with "trains". (Pages 469 - 471)**

2. **DOC LA01 will be revised to replace "fans" with "trains". (Page 471)**

3. **DOC L02 will be revised to add the word "system" where reference is made to the air return fan. (Page 473)**

4. **The ISTS markups will be revised to retain the ISTS terminology of "train(s)" vice the proposed CTS nomenclature "fan". Justification for deviation (JFD) 3 will be deleted, as well as, associated JFD 3 indicators. (Pages 475, 477, and 479)**

5. **The ITS 3.6.11 Bases will be revised to retain the ISTS terminology of "train(s)" vice the proposed CTS nomenclature "fan". The Bases JFD 3 will be deleted, as well as, associated JFD 3 indicators. (Pages 481 - 483, 488 - 490, and 495)**

6. **The ITS Bases Background Section will be revised to discuss that the hydrogen collection headers have isolation valves and the ARS consists of two separate trains of equal capacity, each capable of meeting the design basis. Each train includes a 100% capacity air return fan, associated damper, and hydrogen collection headers. Each train is powered from a separate Engineered Safety Features (ESF) bus. (Pages 481 and 488)**

See Attachment 1 for the draft revised CTS and ISTS markups, new DOC A02, revised DOCs LA01 and L02, and deletion of JFD 3 and Bases JFD 3.

Response

Date/Time	**8/4/2014 6:50 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele** **Caroline Tilton**
Added By	**Scott Bowman**
Date Added	**8/4/2014 5:48 AM**
Date Modified	
Modified By	

ITS A01 3.6.11

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~~ system trains shall be OPERABLE. LA01

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

Insert New A02

ACTION: system train train

A01

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.

SURVEILLANCE REQUIREMENTS

system

SR 3.6.11.1, SR 3.6.11.2, SR 3.6.11.3 — 4.6.5.6 Each ~~containment~~ air return 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

system

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

system

SR 3.6.11.1 — b. ~~At least once per 18 months by~~ verifying that the air return 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

A01

3.6.11

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~~ system trains shall be OPERABLE.

LA01

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

Insert New A02

ACTION:

ACTION A With one ~~containment~~ air return ~~fan~~ system train inoperable, restore the inoperable ~~fan~~ train to OPERABLE status within 72 hours or

ACTION B 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

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 system trains ~~fans~~ 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 trains ~~fans~~ 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.

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

Enclosure 2, Volume 11, Rev. 0, Page 471 of 724

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)”.

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.

LESS RESTRICTIVE CHANGES

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

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.

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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

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

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~~ stet shall be OPERABLE. 1 ~~3~~

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~~ 11 .1 Verify each ARS fan starts on an actual or simulated actuation signal, after a delay of ≥ ~~[~~9.0~~]~~ minutes and ≤ ~~[~~11.0~~]~~ minutes, and operates for ≥ 15 minutes.	~~[[92] days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	1 4 5 5

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.

Not Used

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.~~

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.

1

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~~ 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 potential hydrogen pocket is sufficient to limit the local concentration of hydrogen. 2 ~~2~~

stet

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~~s~~, associated damper, and hydrogen collection headers ~~with~~ ~~common~~ ~~isolation valves~~. Each ~~train~~ ~~fan~~ is powered from a separate Engineered Safety Features (ESF) bus. ~~3~~ 2

stet

The ARS fans are automatically started ~~and the hydrogen collection header isolation valves are opened~~ by the Phase B containment isolation signal approximately ~~containment pressure High-High signal~~ 10 minutes after the containment pressure reaches the pressure setpoint. The fan backdraft dampers ~~time delay~~ ensure~~s~~ 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

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.

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).

stet

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

A.1

stet

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

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~~ 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 potential hydrogen pocket is sufficient to limit the local concentration of hydrogen. 2 2

stet

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~~s~~, associated damper, and common hydrogen collection headers ~~with isolation valves~~. Each ~~train~~ ~~fan~~ is powered from a separate Engineered Safety Features (ESF) bus. ~~3~~ ~~2~~

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 ensure~~s~~ 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~~ stet Containment Spray System~~;~~ train, RHR System~~,~~ train, and ~~an~~ ARS ~~fan~~ 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.

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.

1

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~~

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. ~~3~~ 2

stet

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.

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.~~

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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Licensee Response/NRC Response/NRC Question Closure

Id	**346**
NRC Question Number	**CSS-042**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**9/24/2014**
Notification	**Scott Bowman Michelle Conner Khadijah Hemphill Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**
Added By	**Caroline Tilton**
Date Added	**9/24/2014 9:00 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**13**
NRC Question Number	**GMW-001**
Category	**Technical**
ITS Section	**3.8**
ITS Number	
DOC Number	
JFD Number	
JFD Bases Number	
Page Number (s)	
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Vijay Goel**
Conf Call Requested	**N**
NRC Question	**Part 1 of 2. Regarding the proposed inclusion of TSTF-500, Revision 2, “DC Electrical Rewrite – Update to TSTF-360, as announced in the *Federal Register on* September 1, 2011 (76 FR 54510), please provide the following information:** **A separate copy of the improved technical specifications (ITS), similar to that provided at the March 13, 2014 ITS Project Electrical Systems Presentation (ADAMS accession number ML14071A152) highlighting changes made solely related to inclusion of TSTF-500.**
Attach File 1	
Attach File 2	
Issue Date	**3/18/2014**
Added By	**Khadijah Hemphill**
Date Modified	
Modified By	
Date Added	**3/18/2014 2:28 PM**
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Roger Scott** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id	**8**
NRC Question Number	**GMW-001**
Select Application	**Licensee Response**
Attachment 1	**Att1 - WOG R3.1 Pages from TSTF-500-A Rev2.pdf** (124KB)
Attachment 2	**Att2 - SQN ITS - TSTF-500 highlighted.pdf** (210KB)
Response Statement	**NUREG-1431, Revision 4, has TSTF-500, Revision 2, "DC Electrical Rewrite - Update to TSTF-360," included without indication where the TSTF is incorporated. In order to easily identify TSTF-500 changes, the following is provided:** **Attachment 1 is the proposed ISTS Rev. 3.1 marked-up pages from TSTF-500, Revision 2, "DC Electrical Rewrite - Update to TSTF-360," for Westinghouse plants. The pages are arranged by Specifications (3.8.4, 3.8.5, 3.8.6, and 5.5.17), followed by the Bases (3.8.4, 3.8.5, and 3.8.6).** **Attachment 2 is the submitted SQN, Units 1 and 2, ITS pages, highlighted to indicate changes made that reflect TSTF-500. The pages are arranged by Unit 1 Specifications (3.8.4, 3.8.6, 5.5.15) and Bases (3.8.4 and 3.8.6), followed by Unit 2. SQN did not adopt a TSTF-500 change to Specification 3.8.5; therefore, 3.8.5 pages are not included.**
Response Date/Time	**3/28/2014 11:15 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Roger Scott** **Gerald Waig**
Added By	**Scott Bowman**
Date Added	**3/28/2014 10:16 AM**
Date Modified	
Modified By	

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One [or two] battery charger[s] on one ~~train~~subsystem~~]~~ inoperable.	A.1	Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	AND		
	A.2	Verify battery float current ≤ [2] amps.	Once per [12] hours
	AND		
	A.3	Restore battery charger[s] to OPERABLE status.	[72] hours~~7 days~~
[B. One [or two] batter[y][ies on one ~~train~~subsystem] inoperable.	B.1	Restore batter[y][ies] to OPERABLE status.	[2] hours]
C. One DC electrical power subsystem inoperable for reasons other than Condition A [or B].	C.1	Restore DC electrical power subsystem to OPERABLE status.	[2] hours
D. Required Action and Associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 [DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."]

[One DC electrical power subsystem shall be OPERABLE.]

---------------------------------REVIEWER'S NOTE---------------------------------
This second option above applies for plants having a pre-ITS licensing basis (CTS) for electrical power requirements during shutdown conditions that required only one DC electrical power subsystem to be OPERABLE. Action A the bracketed optional wording in Condition B are also eliminated for this case. The first option above is adopted for plants that have a CTS requiring the same level of DC electrical power subsystem support as is required for power operating conditions.

APPLICABILITY: MODES 5 and 6,
During movement of [recently] irradiated fuel assemblies.

ACTIONS

--NOTE--
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
[A. One [or two] battery charger[s on one ~~train~~subsystem] inoperable. AND The redundant ~~train~~ subsystem battery and charger[s] OPERABLE.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ [2] amps. AND	2 hours Once per [12] hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.3 Restore battery charger[s] to OPERABLE status.	[72] hours~~7 days~~]
B. One [or more] required DC electrical power subsystem[s] inoperable [for reasons other than Condition A. OR Required Actions and associated Completion Time of Condition A not met].	B.1 Declare affected required feature(s) inoperable. OR B.2.1 Suspend CORE ALTERATIONS. AND B.2.2 Suspend movement of [recently] irradiated fuel assemblies. AND B.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration. AND B.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately Immediately Immediately Immediately Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

~~-----REVIEWER'S NOTE-----~~
~~Licensees must implement a program, as specified in Specification 5.5.17, to monitor battery parameters that is based on the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice For Maintenance, Testing, And Replacement Of Vented Lead-Acid Batteries For Stationary Applications."~~
~~----------~~

LCO 3.8.6 Battery parameters for Train A and Train B electrical power subsystem batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One [or two] batter[y][ies on one subsystem~~train~~] with one or more battery cells float voltage < [2.07] V.	A.1	Perform SR 3.8.4.1.	2 hours
	AND		
	A.2	Perform SR 3.8.6.1.	2 hours
	AND		
	A.3	Restore affected cell voltage ≥ [2.07] V.	24 hours
B. One [or two] batter[y][ies on one subsystem~~train~~] with float current > [2] amps.	B.1	Perform SR 3.8.4.1.	2 hours
	AND		
	B.2	Restore battery float current to ≤ [2] amps.	[12] hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
---------------NOTE-------------- Required Action C.2 shall be completed if electrolyte level was below the top of plates. -------------------------------------	-------------------NOTE-------------------- Required Actions C.1 and C.2 are only applicable if electrolyte level was below the top of plates. ---	
C. One [or two] batter[y][ies on one subsystem~~train~~] with one or more cells electrolyte level less than minimum established design limits.	C.1 Restore electrolyte level to above top of plates. AND C.2 Verify no evidence of leakage. AND C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	8 hours 12 hours 31 days
D. One [or two] batter[y][ies on one subsystem~~train~~] with pilot cell electrolyte temperature less than minimum established design limits.	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
E. One or more batteries in redundant subsystems~~trains~~ with battery parameters not within limits.	E.1 Restore battery parameters for batteries in one subsystem~~train~~ to within limits.	2 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. <u>OR</u> One [or two] batter[y][ies on one subsystem~~train~~] with one or more battery cells float voltage < [2.07] V and float current > [2] amps.	F.1 Declare associated battery inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	------------------------------NOTE------------------------------ Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. -- Verify each battery float current is ≤ [2] amps.	7 days
SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ [2.07] V.	31 days
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.5	Verify each battery connected cell float voltage is ≥ [2.07] V.	92 days
SR 3.8.6.6	------------------------------NOTE------------------------------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. --- Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND 12 months when battery shows degradation, or has reached [85]% of the expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached [85]% of the expected life with capacity ≥ 100% of manufacturer's rating

5.5 Programs and Manuals

5.5.16 Containment Leakage Rate Testing Program (continued)

1. Containment leakage rate acceptance criterion is ≤ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and C tests and [< 0.75 L_a for Option A Type A tests] [≤ 0.75 L_a for Option B Type A tests].

2. Air lock testing acceptance criteria are:

a) Overall air lock leakage rate is ≤ [0.05 L_a] when tested at ≥ P_a.

b) For each door, leakage rate is ≤ [0.01 L_a] when pressurized to [≥ 10 psig].

e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.17 Battery Monitoring and Maintenance Program

This Program provides controls for battery restoration and maintenance. The program shall be in accordance with IEEE Standard (Std) 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed by Regulatory Guide 1.129, Revision 2 (RG), with RG exceptions and program provisions as identified below:

a. The program allows the following RG 1.129, Revision 2 exceptions:

1. Battery temperature correction may be performed before or after conducting discharge tests.

2. RG 1.129, Regulatory Position 1, Subsection 2, "References," is not applicable to this program.

3. In lieu of RG 1.129, Regulatory Position 2, Subsection 5.2, "Inspections," the following shall be used: "Where reference is made to the pilot cell, pilot cell selection shall be based on the lowest voltage cell in the battery."

4 In Regulatory Guide 1.129, Regulatory Position 3, Subsection 5.4.1, "State of Charge Indicator," the following statements in paragraph (d) may be omitted: "When it has been recorded that the charging current has stabilized at the charging voltage for three consecutive hourly measurements, the battery is near full charge. These measurements

shall be made after the initially high charging current decreases sharply and the battery voltage rises to approach the charger output voltage."

5. In lieu of RG 1.129, Regulatory Position 7, Subsection 7.6, "Restoration", the following may be used: "Following the test, record the float voltage of each cell of the string."

b. The program shall include the following provisions:

1. Actions to restore battery cells with float voltage < [2.13] V;

2. Actions to determine whether the float voltage of the remaining battery cells is ≥ [2.13] V when the float voltage of a battery cell has been found to be < [2.13] V;

3. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates;

4. Limits on average electrolyte temperature, battery connection resistance, and battery terminal voltage; and

5. A requirement to obtain specific gravity readings of all cells at each discharge test, consistent with manufacturer recommendations.

~~This Program provides for battery restoration and maintenance, based on [the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer] including the following:~~

~~a. Actions to restore battery cells with float voltage < [2.13] V, and~~

~~b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.~~

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources - Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3).

The [125/250] VDC electrical power system consists of two independent and redundant safety related Class 1E DC electrical power subsystems ([Train A and Train B]). Each subsystem consists of [two] 125 VDC batteries [(each battery [50]% capacity)], the associated battery charger(s) for each battery, and all the associated control equipment and interconnecting cabling.

[The 250 VDC source is obtained by use of the two 125 VDC batteries connected in series. Additionally there is [one] spare battery charger per subsystem, which provides backup service in the event that the preferred battery charger is out of service. If the spare battery charger is substituted for one of the preferred battery chargers, then the requirements of independence and redundancy between subsystems are maintained.]

During normal operation, the [125/250] VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

The [Train A and Train B] DC electrical power subsystems provide the control power for its associated Class 1E AC power load group, [4.16] kV switchgear, and [480] V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

The DC power distribution system is described in more detail in Bases for LCO 3.8.9, "Distribution System - Operating," and LCO 3.8.10, "Distribution Systems - Shutdown."

BASES

BACKGROUND (continued)

Each 125/250 VDC battery is separately housed in a ventilated room apart from its charger and distribution centers. Each subsystem is located in an area separated physically and electrically from the other subsystem to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. [There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels.]

Each battery has adequate storage capacity to meet the duty cycle(s) discussed in the FSAR, Chapter [8] (Ref 4). The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors.

The batteries for Train A and Train B DC electrical power subsystems are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit is [105/210] V.

The battery cells are of flooded lead acid construction with a nominal specific gravity of [1.215]. This specific gravity corresponds to an open circuit battery voltage of approximately 120 V for a [58] cell battery (i.e., cell voltage of [2.065] volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage [2.20 to 2.25] Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of [2.22] Vpc corresponds to a total float voltage output of [128.8] V for a [58] cell battery as discussed in the FSAR, Chapter [8] (Ref. 4).

Each Train A and Train B DC electrical power subsystem battery charger has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient excess capacity to restore the battery from the design minimum charge to its fully charged state within [24] hours while supplying normal steady state loads discussed in the FSAR, Chapter [8] (Ref. 4).

BASES

BACKGROUND (continued)

The battery charger is normally in the float-charge mode. Float-charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the battery. This assures the internal losses of a battery are overcome and the battery is maintained in a fully charged state.

When desired, the charger can be placed in the equalize mode. The equalize mode is at a higher voltage than the float mode and charging current is correspondingly higher. The battery charger is operated in the equalize mode after a battery discharge or for routine maintenance. Following a battery discharge, the battery recharge characteristic accepts current at the current limit of the battery charger (if the discharge was significant, e.g., following a battery service test) until the battery terminal voltage approaches the charger voltage setpoint. Charging current then reduces exponentially during the remainder of the recharge cycle. Lead-calcium batteries have recharge efficiencies of greater than 95%, so once at least 105% of the ampere-hours discharged have been returned, the battery capacity would be restored to the same condition as it was prior to the discharge. This can be monitored by direct observation of the exponentially decaying charging current or by evaluating the amp-hours discharged from the battery and amp-hours returned to the battery.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter [6] (Ref. 5) and Chapter [15] (Ref. 6), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power and

b. A worst-case single failure.

The DC sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The DC electrical power subsystems, each subsystem consisting of [two] batteries, battery charger [for each battery] and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the ~~train~~ subsystem are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any ~~train~~ DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4).

An OPERABLE DC electrical power subsystem requires all required batteries and respective chargers to be operating and connected to the associated DC bus(es).

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.5, "DC Sources - Shutdown."

ACTIONS

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

Condition A represents one ~~train~~ subsystem with one [or two] battery chargers inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within [12] hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.

BASES

ACTIONS (continued)

-----------------------------------REVIEWER'S NOTE-----------------------------------
A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within [12] hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to [2] amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it ~~has~~ is now ~~been~~ fully ~~recharged~~ capable of supplying the maximum expected load requirement. The [2] amp value is based on returning the battery to [95]% charge and assumes a [5]% design margin for the battery. If at the expiration of the initial [12] hour period the battery float current is not less than or equal to [2] amps this indicates there may be additional battery problems and the battery must be declared inoperable.

BASES

ACTIONS (continued)

----------------------------------REVIEWER'S NOTE----------------------------------
Any licensee wishing to adopt Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications", and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Alternatively, a 7 day Completion Time can be justified by an acceptable method, such as a regulatory commitment that an alternate means to charge the batteries will be available that is capable of being supplied power from a power source that is independent of the offsite power supply. Otherwise, the 72 hour Completion Time must be adopted.

Required Action A.3 limits the restoration time for the inoperable battery charger to [72] hours~~days~~. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger). The [72] hour ~~day~~ Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

B.1

----------------------------------REVIEWER'S NOTES--------------------------------

1. The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in ~~Regulatory Guide (~~RG~~)~~ 1.177 and RG 1.174.~~, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications."~~

2. Condition B is included if Required Action B.1 (One [or two] batter[y][ies on one subsystem] inoperable) and Required Action C.1 (One DC electrical power subsystem inoperable for reasons other than Condition A [or B]) would have different Completion Times. If the plant design supports different Completion Times when a battery is inoperable but the charger is OPERABLE, then Condition B is used. If not, Condition B is deleted and only Condition C is used.

Condition B represents one ~~train~~ subsytem with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is

being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that ~~train~~subsystem. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times.

BASES

ACTIONS (continued)

C.1

Condition C represents one ~~train~~ subsystem with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected ~~train~~subsystem. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution subsystem ~~train~~.

If one of the required DC electrical power subsystems is inoperable for reasons other than Condition A or B (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst- case single failure could, however, result in the loss of the minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

D.1 and D.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer ([2.20] Vpc times the number of connected cells or [127.6] V for a 58 cell battery at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life ~~(expected to be approximately 20 years)~~. The 7 day Frequency is consistent with manufacturer recommendations ~~and IEEE-450 (Ref. 8)~~.

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 8~~9~~), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying [400] amps at the minimum established float voltage for [8] hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least [2] hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the

BASES

SURVEILLANCE REQUIREMENTS (continued)

battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ [2] amps.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 8~~9~~) and Regulatory Guide 1.129 (Ref. 9~~10~~), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed [18 months].

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment. Credit may be taken for unplanned events that satisfy this SR.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.

2. Regulatory Guide 1.6, March 10, 1971.

3. IEEE-308-[1978].

4. FSAR, Chapter [8].

5. FSAR, Chapter [6].

6. FSAR, Chapter [15].

7. Regulatory Guide 1.93, December 1974.

~~8. IEEE-450-[1995].~~

8~~9~~. Regulatory Guide 1.32, February 1977.

9~~10~~. Regulatory Guide 1.129, December 1974.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources - Shutdown

BASES

BACKGROUND	A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter [6] (Ref. 1) and Chapter [15] (Ref. 2), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of [recently] irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods,

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident [involving handling recently irradiated fuel. Due to radioactive decay, DC electrical power is only required to mitigate fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)].

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many DBAs that are analyzed in MODES [1, 2, 3, and 4] have no specific analyses in MODES [5 and 6] because the energy contained within the reactor pressure

BASES

BACKGROUND (continued)

boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

The DC sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The DC electrical power subsystems, [each required] [the required] [subsystem consisting of two batteries, one battery charger per battery, and the corresponding control equipment and interconnecting cabling within the ~~train~~subsystem, [are] [is] required to be OPERABLE to support [required] [one] ~~train~~subsystem[s] of the distribution systems [required OPERABLE by LCO 3.8.10, "Distribution Systems - Shutdown."] This ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents [involving handling recently irradiated fuel]).

BASES

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of [recently] irradiated fuel assemblies, provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core,

b. Required features needed to mitigate a fuel handling accident [involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous [X] days)] are available,

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available, and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

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

----------------------------------REVIEWER'S NOTE----------------------------------
ACTION A is included only when plant-specific implementation of LCO 3.8.5 includes the potential to require both ~~train~~subsystems of the DC System to be OPERABLE. If plant-specific implementation results in LCO 3.8.5 requiring only one ~~train~~subsystems of the DC System to be OPERABLE, then ACTION A is omitted and ACTION B is renumbered as ACTION A.

BASES

ACTIONS (continued)

Condition A represents one ~~train~~subsystem with one [or two] battery chargers inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within [12] hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.

----------------------------------REVIEWER'S NOTE----------------------------------
A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

ACTIONS (continued)

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within [12] hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to [2] amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it has now been fully recharged. If at the expiration of the initial [12] hour period the battery float current is not less than or equal to [2] amps this indicates there may be additional battery problems and the battery must be declared inoperable.

---------------------------------REVIEWER'S NOTE---------------------------------
Any licensee wishing to adopt a Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." Otherwise, the 72 hour Completion Time must be adopted.

Required Action A.3 limits the restoration time for the inoperable battery charger to [72] hour ~~days~~. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger). The [72] hour ~~day~~ Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

B.1, B.2.1, B.2.2, B.2.3, and B.2.4

[If two ~~train~~subsystems are required by LCO 3.8.10, the remaining ~~train~~subsystem with DC power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and [recently] irradiated fuel movement]. By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend

CORE ALTERATIONS, movement of [recently] irradiated fuel assemblies, and operations involving positive reactivity additions) that could result in loss of required SDM (MODE 5) or boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet

BASES

ACTIONS (continued)

the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystem[s] and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.3. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

REFERENCES

1. FSAR, Chapter [6].

2. FSAR, Chapter [15].

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the DC power subsystem batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the [licensee controlled program] also implements a program specified in Specification 5.5.17 for monitoring various battery parameters~~ that is based on the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice For Maintenance, Testing, And Replacement Of Vented Lead-Acid Batteries For Stationary Applications" (Ref. 1)~~.

The battery cells are of flooded lead acid construction with a nominal specific gravity of [1.215]. This specific gravity corresponds to an open circuit battery voltage of approximately 120 V for [58] cell battery (i.e., cell voltage of [2.065] volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage [2.20 to 2.25] Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. The nominal float voltage of [2.22] Vpc corresponds to a total float voltage output of [128.8] V for a [58] cell battery as discussed in the FSAR, Chapter [8] (Ref. 2).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter [6] (Ref. 3) and Chapter [15] (Ref. 4), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one ~~train~~subsystem of DC sources OPERABLE during accident conditions, in the event of:

BASES

APPLICABLE SAFETY ANALYSES (continued)

a. An assumed loss of all offsite AC power or all onsite AC power and

b. A worst-case single failure.

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

LCO

Battery parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. Battery parameter limits are conservatively established, allowing continued DC electrical system function even with limits not met. Additional preventative maintenance, testing, and monitoring performed in accordance with the [licensee controlled program] is conducted as specified in Specification 5.5.17.

APPLICABILITY

The battery parameters are required solely for the support of the associated DC electrical power subsystems. Therefore, battery parameter limits are only required when the DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

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

With one or more cells in one or more batteries in one ~~train~~subsystem < [2.07] V, the battery cell is degraded. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage (SR 3.8.4.1) and of the overall battery state of charge by monitoring the battery float charge current (SR 3.8.6.1). This assures that there is still sufficient battery capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of one or more cells in one or more batteries < [2.07] V, and continued operation is permitted for a limited period up to 24 hours.

Since the Required Actions only specify "perform," a failure of SR 3.8.4.1 or SR 3.8.6.1 acceptance criteria does not result in this Required Action not met. However, if one of the SRs is failed the appropriate Condition(s), depending on the cause of the failures, is entered. If SR 3.8.6.1 is failed then there is not assurance that there is still sufficient battery capacity to perform the intended function and the battery must be declared inoperable immediately.

BASES

ACTIONS (continued)

B.1 and B.2

One or more batteries in one ~~train~~subsystem with float current > [2] amps indicates that a partial discharge of the battery capacity has occurred. This may be due to a temporary loss of a battery charger or possibly due to one or more battery cells in a low voltage condition reflecting some loss of capacity. Within 2 hours verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage. If the terminal voltage is found to be less than the minimum established float voltage there are two possibilities, the battery charger is inoperable or is operating in the current limit mode. Condition A addresses charger inoperability. If the charger is operating in the current limit mode after 2 hours that is an indication that the battery has been substantially discharged and likely cannot perform its required design functions. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within [12] hours (Required Action B.2). The battery must therefore be declared inoperable.

If the float voltage is found to be satisfactory but there are one or more battery cells with float voltage less than [2.07] V, the associated "OR" statement in Condition F is applicable and the battery must be declared inoperable immediately. If float voltage is satisfactory and there are no cells less than [2.07] V there is good assurance that, within [12] hours, the battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger.

----------------------------------REVIEWER'S NOTE----------------------------------
A plant that cannot meet the 12 hour Completion Time due to an inherent battery charging characteristic can propose an alternate time equal to 2 hours plus the time experienced to accomplish the exponential charging current portion of the battery charge profile following the service test (SR 3.8.4.3).

BASES

ACTIONS (continued)

A discharged battery with float voltage (the charger setpoint) across its terminals indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.

If the condition is due to one or more cells in a low voltage condition but still greater than [2.07] V and float voltage is found to be satisfactory, this is not indication of a substantially discharged battery and [12] hours is a reasonable time prior to declaring the battery inoperable.

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

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

With one or more batteries in one ~~train~~subsystem with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. Within 31 days the minimum established design limits for electrolyte level must be re-established.

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.17, Battery Monitoring and Maintenance Program). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.17.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from ~~Annex D of~~ IEEE Standard 450~~-1995~~. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing the batter[y][ies] may have to be declared inoperable and the affected cell[s] replaced.

BASES

ACTIONS (continued)

D.1

With one or more batteries in one ~~train~~subsystem with pilot cell temperature less than the minimum established design limits, 12 hours is allowed to restore the temperature to within limits. A low electrolyte temperature limits the current and power available. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function and the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not met.

E.1

With one or more batteries in redundant ~~trains~~subsystems with battery parameters not within limits there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved this potential could result in a total loss of function on multiple systems that rely upon the batteries. The longer Completion Times specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one ~~train~~subsystem within 2 hours.

F.1

With one or more batteries with any battery parameter outside the allowances of the Required Actions for Condition A, B, C, D, or E, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering one or more batteries in one ~~train~~subsystem with one or more battery cells float voltage less than [2.07] V and float current greater than [2] amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

BASES

REFERENCES

1. IEEE-450~~ [1995]~~.
2. FSAR, Chapter 8.
3. FSAR, Chapter [6].
4. FSAR, Chapter [15].
5. IEEE-485-[1983], June 1983.

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

3.8.2.3

LCO 3.8.4 ~~The Train A and Train B~~ Two Vital DC electrical power trains and four diesel generator (DG) DC electrical power subsystems shall be OPERABLE. 1

Applicability

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

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
DOC L01	A. One ~~[or two]~~ vital battery charger~~[s]~~ on one ~~subsystem~~ train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	~~[~~2 hours~~]~~	2 3 1
		AND		
		A.2 Verify battery float current ≤ ~~[~~2~~]~~ amps.	Once per ~~[~~12~~]~~ hours	3
		AND		
		A.3 Restore vital battery charger~~[s]~~ to OPERABLE status.	~~[72] hours~~ 7 days	1 3 4
	~~[B. One [or two] batter[y][ies on one subsystem] inoperable.~~	~~B.1 Restore batter[y][ies] to OPERABLE status.~~	~~[2] hours]~~	5
3.8.2.3 ACTION b	~~C~~ B. One vital DC electrical power ~~subsystem~~ train inoperable for reasons other than Condition A ~~[or B]~~.	~~C~~ B.1 Restore vital DC electrical power ~~subsystem~~ train to OPERABLE status.	~~[~~2~~]~~ hours	5 3 1 3
3.8.2.3 ACTION b	~~D~~ C. Required Action and Associated Completion Time of Condition A or B not met.	~~D~~ C.1 Be in MODE 3.	6 hours	5 2
		AND		
		~~D~~ C.2 Be in MODE 5.	36 hours	

INSERT 1

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

The Reviewer's Note is deleted.

3.8.1.1, 3.8.1.2, 3.8.2.3, 3.8.2.4 — LCO 3.8.6 Battery parameters for Train A and Train B Vital batteries and diesel generator (DG) batteries ~~electrical power subsystem~~ shall be within limits. 1

Applicability — APPLICABILITY: When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. 1

ACTIONS

-----NOTE-----

DOC A03 — Separate Condition entry is allowed for each battery.

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
DOC L01	A. One [or ~~two~~ more] batter~~[y]~~[ies ~~on one subsystem]~~ with one or more battery cells float voltage < ~~[~~2.07~~]~~ V.	A.1	Perform SR 3.8.4.1.	2 hours	2 3
		AND			
		A.2	Perform SR 3.8.6.1.	2 hours	2
		AND			
		A.3	Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	24 hours	
DOC L01	B. One [or ~~two~~ more Vital] batter~~[y]~~[ies ~~on one subsystem]~~ with float current > ~~[~~2~~]~~ amps.	B.1	Perform SR 3.8.4.1.	2 hours	2 3
		AND			
INSERT 1		B.2.1	Restore Vital battery float current to ≤ ~~[~~2~~]~~ amps.	~~[~~12~~]~~ hours	3

SURVEILLANCE REQUIREMENTS (continued)

CTS		SURVEILLANCE	FREQUENCY	
4.8.1.1.3.a.1, 4.8.2.3.2.a.1	SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5
4.8.1.1.3.b.3, 4.8.2.3.2.b.3	SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	SR 3.8.6.5	Verify each battery connected cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 5

5.5 Programs and Manuals

5.5.~~16~~ 14 Containment Leakage Rate Testing Program (continued) 4

~~1. Containment leakage rate acceptance criterion is ≤ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and C tests and [< 0.75 L_a for Option A Type A tests] [≤ 0.75 L_a for Option B Type A tests].~~

~~2. Air lock testing acceptance criteria are:~~

~~a) Overall air lock leakage rate is ≤ [0.05 L_a] when tested at ≥ P_a.~~

~~b) For each door, leakage rate is ≤ [0.01 L_a] when pressurized to [≥ 10 psig].~~

~~e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.~~

~~f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.~~

10

DOC M03 5.5.~~17~~ 15 Battery Monitoring and Maintenance Program 4

~~-----REVIEWER'S NOTE-----~~
~~This program and the corresponding requirements in LCO 3.8.4, LCO 3.8.5, and LCO 3.8.6 require providing the information and verifications requested in the Notice of Availability for TSTF-500, Revision 2, "DC Electrical Rewrite - Update to TSTF-360," (76FR54510).~~
~~----------~~

5

This Program provides controls for battery restoration and maintenance. The program shall be in accordance with IEEE Standard (Std) 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed by Regulatory Guide 1.129, Revision 2 (RG), with RG exceptions and program provisions as identified below:

a. The program allows the following RG 1.129, Revision 2 exceptions:

1. Battery temperature correction may be performed before or after conducting discharge tests.

2. RG 1.129, Regulatory Position 1, Subsection 2, "References," is not applicable to this program.

5.5 Programs and Manuals

DOC M01 5.5.~~17~~ 15 Battery Monitoring and Maintenance Program (continued) 4

3. In lieu of RG 1.129, Regulatory Position 2, Subsection 5.2, "Inspections," the following shall be used: "Where reference is made to the pilot cell, pilot cell selection shall be based on the lowest voltage cell in the battery."

4 In Regulatory Guide 1.129, Regulatory Position 3, Subsection 5.4.1, "State of Charge Indicator," the following statements in paragraph (d) may be omitted: "When it has been recorded that the charging current has stabilized at the charging voltage for three consecutive hourly measurements, the battery is near full charge. These measurements shall be made after the initially high charging current decreases sharply and the battery voltage rises to approach the charger output voltage."

5. In lieu of RG 1.129, Regulatory Position 7, Subsection 7.6, "Restoration," the following may be used: "Following the test, record the float voltage of each cell of the string."

b. The program shall include the following provisions:

1. Actions to restore battery cells with float voltage < ~~[~~2.13~~]~~ V; 2

Table 4.8.2 Float Voltage

2. Actions to determine whether the float voltage of the remaining battery cells is ≥ ~~[~~2.13~~]~~ V when the float voltage of a battery cell has been found to be < ~~[~~2.13~~]~~ V; 2

3. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates;

4. Limits on average electrolyte temperature, battery connection resistance, and battery terminal voltage; and

5. A requirement to obtain specific gravity readings of all cells at each discharge test, consistent with manufacturer recommendations.

6.17 5.5.~~18~~ 16 Control Room Envelope (CRE) Habitability Program 4

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~VS), CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of ~~[5 rem whole body or its equivalent to any part of the body]~~ ~~[~~5 rem total 3 2

BASES

ACTIONS (continued)

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within ~~[~~12~~]~~ hours, avoiding a premature shutdown with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within ~~[~~2~~]~~ hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for. 2

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within ~~[~~12~~]~~ hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to ~~[~~2~~]~~ amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The ~~[~~2~~]~~ amp value is based on returning the battery to ~~[~~95~~]~~% charge and assumes a ~~[~~5~~]~~% design margin for the battery. If at the expiration of the initial ~~[~~12~~]~~ hour period the battery float current is not less than or equal to ~~[~~2~~]~~ amps this indicates there may be additional battery problems and the battery must be declared inoperable.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Any licensee wishing to adopt Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."~~ 4

BASES

ACTIONS (continued)

~~Alternatively, a 7 day Completion Time can be justified by an acceptable method, such as a regulatory commitment that an alternate means to charge the batteries will be available that is capable of being supplied power from a power source that is independent of the offsite power supply. Otherwise, the 72 hour Completion Time must be adopted.~~
~~---~~ 4

Required Action A.3 limits the restoration time for the inoperable vital battery charger to ~~[72] hours~~ 7 days. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., ~~balance of plant non-Class 1E~~ fifth battery charger). The ~~[72] hour~~ 7 day Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status. 1 2 1 2

~~B.1~~

~~----------------------------REVIEWER'S NOTES----------------------------~~

~~1. The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in RG 1.177 and RG 1.174.~~

~~2. Condition B is included if Required Action B.1 (one [or two] batter[y][ies on one subsystem] inoperable) and Required Action C.1 (one DC electrical power subsystem inoperable for reasons other than Condition A [or B]) would have different Completion Times. If the plant design supports different Completion Times when a battery is inoperable but the charger is OPERABLE, then Condition B is used. If not, Condition B is deleted and only Condition C is used.~~
~~---~~

~~Condition B represents one subsystem with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that subsystem. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the~~ 6

BASES

ACTIONS (continued)

~~batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times.~~ 6

B

~~C~~.1 6

B vital DC train

Condition ~~C~~ represents one ~~subsystem~~ with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected ~~subsystem~~. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution subsystem.

train vital

If one of the required DC electrical power ~~subsystems~~ is inoperable for reasons other than Condition A ~~or B~~ (e.g., inoperable battery charger ~~and associated inoperable battery~~), the remaining DC electrical power ~~subsystem~~ has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst~~-~~ case single failure could, however, result in the loss of the minimum necessary DC electrical ~~subsystems~~ to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power ~~subsystem~~ and, if the DC electrical power ~~subsystem~~ is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown. 6 1

vital trains vital train vital trains vital vital train

C

~~D~~.1 and ~~D~~.2 6

vital train

If the inoperable DC electrical power ~~subsystem~~ cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

INSERT 9

1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC train or subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (~~[2.20] Vpc times the number of connected cells or [127.6]~~ 129 V for the Vital batteries and 124 V for the DG batteries ~~for a 58 cell battery at the battery terminals~~). This voltage maintains the battery plates in a condition that supports maintaining the grid life. ~~[The 7 day Frequency is consistent with manufacturer recommendations.~~ 1 1 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.~~
~~---]~~ 4

SR 3.8.4.2

This SR verifies the design capacity of the vital battery chargers. According to Regulatory Guide 1.32 (Ref. 8), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied. 1

This SR provides two options. One option requires that each battery charger be capable of supplying ~~[400]~~ 150 amps at the minimum established float voltage (129 V DC) for ~~[8]~~ 4 hours. The ampere requirements are based on the 2 1 2

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

Vital and diesel generator (DG)

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the ~~DC power subsystem~~ batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.~~17~~ 15 for monitoring various battery parameters. 1 2 3

The reference to IEEE 450 is deleted. 1

Vital

The battery cells are of flooded lead acid construction with a nominal specific gravity of [1.215]. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ 123.78 V for ~~[58]~~ 60 cell battery (i.e., cell voltage of ~~[2.065]~~ 2.063 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a float voltage ~~[2.20 to 2.25]~~ 2.17 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. ~~The nominal float voltage of [2.22] Vpc corresponds to a total float voltage output of [128.8] V for a [58] cell battery as discussed in the FSAR, Chapter [8] (Ref. 2).~~ 2 4 2 1

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the U FSAR, Chapter [6] (Ref. 3) and Chapter [15] (Ref. 4), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. 1 2

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one ~~subsystem~~ train of DC sources OPERABLE during accident conditions, in the event of: 1

a. An assumed loss of all offsite AC power or all onsite AC power and

b. A worst-case single failure.

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

3.8.2.3 — LCO 3.8.4 — ~~The Train A and Train B~~ Two Vital DC electrical power trains and four diesel generator (DG) DC electrical power subsystems shall be OPERABLE. (1)

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 — A. One ~~[or two]~~ vital battery charger~~[s]~~ on one ~~subsystem~~ train inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ ~~[~~2~~]~~ amps. AND A.3 Restore vital battery charger~~[s]~~ to OPERABLE status.	~~[~~2 hours~~]~~ (2) (3) (1) Once per ~~[~~12~~]~~ hours (3) ~~[72] hours~~ 7 days (1) (3) (4)
~~[B. One [or two] batter[y][ies on one subsystem] inoperable.~~	~~B.1 Restore batter[y][ies] to OPERABLE status.~~	~~[2] hours]~~ (5)
3.8.2.3 ACTION b — ~~C.~~ B. One vital DC electrical power ~~subsystem~~ train inoperable for reasons other than Condition A ~~[or B]~~.	~~C.~~ B.1 Restore vital DC electrical power ~~subsystem~~ train to OPERABLE status.	~~[~~2~~]~~ hours (5) (3) (1) (3)
3.8.2.3 ACTION b — ~~D.~~ C. Required Action and Associated Completion Time of Condition A or B not met.	~~D.~~ C.1 Be in MODE 3. AND ~~D.~~ C.2 Be in MODE 5.	6 hours 36 hours (5) (2)

INSERT 1

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3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

The Reviewer's Note is deleted.

3.8.1.1, 3.8.1.2, 3.8.2.3, 3.8.2.4 | LCO 3.8.6 | Battery parameters for Train A and Train B Vital batteries and diesel generator (DG) batteries ~~electrical power subsystem~~ shall be within limits. 1

Applicability | APPLICABILITY: | When associated Vital DC and DG DC electrical power subsystems are required to be OPERABLE. 1

ACTIONS

-----NOTE-----

DOC A03 Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
DOC L01 A. One [or ~~two~~ more] batter~~[y]~~[ies ~~on one subsystem]~~ with one or more battery cells float voltage < ~~[~~2.07~~]~~ V.	A.1 Perform SR 3.8.4.1. AND A.2 Perform SR 3.8.6.1. AND A.3 Restore affected cell voltage ≥ ~~[~~2.07~~]~~ V.	2 hours 2 3 2 2 hours 24 hours
DOC L01 B. One [or ~~two~~ more Vital] batter~~[y]~~[ies ~~on one subsystem]~~ with float current > ~~[~~2~~]~~ amps. INSERT 1	B.1 Perform SR 3.8.4.1. AND B.2 .1 Restore Vital battery float current to ≤ ~~[~~2~~]~~ amps.	2 hours ~~[~~12~~]~~ hours 2 3 3

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.8.1.1.3.a.1, 4.8.2.3.2.a.1	SR 3.8.6.2	Verify each battery pilot cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5
4.8.1.1.3.b.3, 4.8.2.3.2.b.3	SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	~~[31 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	5
4.8.1.1.3.b.1, 4.8.2.3.2.b.1	SR 3.8.6.5	Verify each battery connected cell float voltage is ≥ ~~[~~2.07~~]~~ V.	~~[92 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	2 5

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5.5 Programs and Manuals

5.5.~~16~~ 14 Containment Leakage Rate Testing Program (continued) 4

~~1. Containment leakage rate acceptance criterion is ≤ 1.0 L_a. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and C tests and [< 0.75 L_a for Option A Type A tests] [≤ 0.75 L_a for Option B Type A tests].~~

~~2. Air lock testing acceptance criteria are:~~

~~a) Overall air lock leakage rate is ≤ [0.05 L_a] when tested at ≥ P_a.~~

~~b) For each door, leakage rate is ≤ [0.01 L_a] when pressurized to [≥ 10 psig].~~

~~e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.~~

~~f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.~~ 10

DOC M03 5.5.~~17~~ 15 Battery Monitoring and Maintenance Program 4

~~REVIEWER'S NOTE~~
~~This program and the corresponding requirements in LCO 3.8.4, LCO 3.8.5, and LCO 3.8.6 require providing the information and verifications requested in the Notice of Availability for TSTF-500, Revision 2, "DC Electrical Rewrite - Update to TSTF-360," (76FR54510).~~ 5

This Program provides controls for battery restoration and maintenance. The program shall be in accordance with IEEE Standard (Std) 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," as endorsed by Regulatory Guide 1.129, Revision 2 (RG), with RG exceptions and program provisions as identified below:

a. The program allows the following RG 1.129, Revision 2 exceptions:

1. Battery temperature correction may be performed before or after conducting discharge tests.

2. RG 1.129, Regulatory Position 1, Subsection 2, "References," is not applicable to this program.

5.5 Programs and Manuals

DOC M01 5.5.~~17~~ 15 Battery Monitoring and Maintenance Program (continued) 4

3. In lieu of RG 1.129, Regulatory Position 2, Subsection 5.2, "Inspections," the following shall be used: "Where reference is made to the pilot cell, pilot cell selection shall be based on the lowest voltage cell in the battery."

4 In Regulatory Guide 1.129, Regulatory Position 3, Subsection 5.4.1, "State of Charge Indicator," the following statements in paragraph (d) may be omitted: "When it has been recorded that the charging current has stabilized at the charging voltage for three consecutive hourly measurements, the battery is near full charge. These measurements shall be made after the initially high charging current decreases sharply and the battery voltage rises to approach the charger output voltage."

5. In lieu of RG 1.129, Regulatory Position 7, Subsection 7.6, "Restoration," the following may be used: "Following the test, record the float voltage of each cell of the string."

b. The program shall include the following provisions:

1. Actions to restore battery cells with float voltage < ~~[~~2.13~~]~~ V; 2

Table 4.8.2 Float Voltage

2. Actions to determine whether the float voltage of the remaining battery cells is ≥ ~~[~~2.13~~]~~ V when the float voltage of a battery cell has been found to be < ~~[~~2.13~~]~~ V; 2

3. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates;

4. Limits on average electrolyte temperature, battery connection resistance, and battery terminal voltage; and

5. A requirement to obtain specific gravity readings of all cells at each discharge test, consistent with manufacturer recommendations.

6.17 5.5.~~18~~ 16 Control Room Envelope (CRE) Habitability Program 4

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency ~~Filtration~~ Ventilation System (CRE~~F~~VS), CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of ~~[5 rem whole body or its equivalent to any part of the body]~~ ~~[~~5 rem total 3 2

BASES

ACTIONS (continued)

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is good assurance of fully recharging the battery within ~~[~~12~~]~~ hours, avoiding a premature shutdown with its own attendant risk.

If established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within ~~[~~2~~]~~ hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

If the charger is operating in the current limit mode after 2 hours that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within ~~[~~12~~]~~ hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as less than or equal to ~~[~~2~~]~~ amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The ~~[~~2~~]~~ amp value is based on returning the battery to ~~[~~95~~]~~% charge and assumes a ~~[~~5~~]~~% design margin for the battery. If at the expiration of the initial ~~[~~12~~]~~ hour period the battery float current is not less than or equal to ~~[~~2~~]~~ amps this indicates there may be additional battery problems and the battery must be declared inoperable.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Any licensee wishing to adopt Completion Time greater than 72 hours for Required Action A.3 will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," and RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."~~

BASES

ACTIONS (continued)

~~Alternatively, a 7 day Completion Time can be justified by an acceptable method, such as a regulatory commitment that an alternate means to charge the batteries will be available that is capable of being supplied power from a power source that is independent of the offsite power supply. Otherwise, the 72 hour Completion Time must be adopted.~~
~~--~~ 4

Required Action A.3 limits the restoration time for the inoperable vital battery charger to 7 days ~~[72] hours~~. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., ~~balance of plant non-Class 1E~~ fifth battery charger). The 7 day ~~[72] hour~~ Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status. 1 2 1 2

~~B.1~~

~~-----------------------------REVIEWER'S NOTES-----------------------------~~
~~1. The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in RG 1.177 and RG 1.174.~~

~~2. Condition B is included if Required Action B.1 (one [or two] batter[y][ies on one subsystem] inoperable) and Required Action C.1 (one DC electrical power subsystem inoperable for reasons other than Condition A [or B]) would have different Completion Times. If the plant design supports different Completion Times when a battery is inoperable but the charger is OPERABLE, then Condition B is used. If not, Condition B is deleted and only Condition C is used.~~
~~--~~ 6

~~Condition B represents one subsystem with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that subsystem. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the~~

BASES

ACTIONS (continued)

~~batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times.~~ 6

B ~~C~~.1 6

Condition B ~~C~~ represents one vital DC train ~~subsystem~~ with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected train ~~subsystem~~. The 2 hour limit is consistent with the allowed time for an inoperable vital DC distribution subsystem.

If one of the required vital DC electrical power trains ~~subsystems~~ is inoperable for reasons other than Condition A ~~or B~~ (e.g., inoperable battery charger ~~and associated inoperable battery~~), the remaining vital DC electrical power train ~~subsystem~~ has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst~~-~~ case single failure could, however, result in the loss of the minimum necessary vital DC electrical trains ~~subsystems~~ to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable vital DC electrical power train ~~subsystem~~ and, if the vital DC electrical power train ~~subsystem~~ is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown. 6 1

C ~~D~~.1 and C ~~D~~.2 6

If the inoperable vital DC electrical power train ~~subsystem~~ cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

INSERT 9 1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC train or subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer (~~[2.20] Vpc times the number of connected cells or [127.6]~~ 129 V for the Vital batteries and 124 V for the DG batteries ~~for a 58 cell battery at the battery terminals~~). This voltage maintains the battery plates in a condition that supports maintaining the grid life. ~~[The 7 day Frequency is consistent with manufacturer recommendations.~~

~~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 3.8.4.2

This SR verifies the design capacity of the vital battery chargers. According to Regulatory Guide 1.32 (Ref. 8), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

This SR provides two options. One option requires that each battery charger be capable of supplying ~~[400]~~ 150 amps at the minimum established float voltage (129 V DC) for ~~[8]~~ 4 hours. The ampere requirements are based on the

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the ~~DC power subsystem~~ Vital and diesel generator (DG) batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown." In addition to the limitations of this Specification, the ~~[licensee controlled program]~~ Battery Monitoring and Maintenance Program also implements a program specified in Specification 5.5.~~17~~ 15 for monitoring various battery parameters. 1 2 3

The reference to IEEE 450 is deleted.

The Vital battery cells are of flooded lead acid construction with a nominal specific gravity of ~~[~~1.215~~]~~. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ 123.78 V for ~~[58]~~ 60 cell battery (i.e., cell voltage of ~~[2.065]~~ 2.063 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.065] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a float voltage ~~[2.20 to 2.25]~~ 2.17 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. ~~The nominal float voltage of [2.22] Vpc corresponds to a total float voltage output of [128.8] V for a [58] cell battery as discussed in the FSAR, Chapter [8] (Ref. 2).~~ 1 2 4 2 1

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter ~~[~~6~~]~~ (Ref. 3) and Chapter ~~[~~15~~]~~ (Ref. 4), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. 1 2

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one ~~subsystem~~ train of DC sources OPERABLE during accident conditions, in the event of: 1

a. An assumed loss of all offsite AC power or all onsite AC power and

b. A worst-case single failure.

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

Licensee Response/NRC Response/NRC Question Closure

Id	**14**
NRC Question Number	**GMW-001**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**4/24/2014**
Notification	**Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lisa Regner** **Gerald Waig**
Added By	**Gerald Waig**
Date Added	**4/24/2014 2:02 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**14**
NRC Question Number	**GMW-002**
Category	**Technical**
ITS Section	**3.8**
ITS Number	
DOC Number	
JFD Number	
JFD Bases Number	
Page Number (s)	
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Vijay Goel**
Conf Call Requested	**N**
NRC Question	**Part 2 of 2. Regarding the proposed inclusion of TSTF-500, Revision 2, "DC Electrical Rewrite – Update to TSTF-360, as announced in the *Federal Register on* September 1, 2011 (76 FR 54510), please provide the following information:** **Requirements as identified in TSTF-500, Revision 2 model application and safety evaluation published in the *FR* including:** **1. Enclosures, Verifications, and Commitments** **2. Identification of any Optional Changes and Variations from the published TSTF**
Attach File 1	
Attach File 2	
Issue Date	**3/18/2014**
Added By	**Khadijah Hemphill**
Date Modified	
Modified By	
Date Added	**3/18/2014 2:30 PM**
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lisa Regner** **Roger Scott** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id	**9**
NRC Question Number	**GMW-002**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 - Letter from Manufacturer.pdf** (145KB)
Attachment 2	
Response Statement	

As required by TSTF-500, Revision 2, "DC Electrical Rewrite - Update to TSTF–360," model application, below are the Section 2.2 SQN verifications:

1. **Attachment 1 is a letter from the manufacturer of the batteries used at SQN, Units 1 and 2. For the Vital batteries, it states, "after a discharge, when the float current drops to less than or equal to 2 amps, the battery should be at least 98% charged." For the DG batteries, it states, "after a discharge, when the float current drops to less than or equal to 1 amp, the battery should be at least 98% charged." Additionally, the letter states, "This relationship will not change as the batteries age." Therefore, monitoring float current as a reliable and accurate indication of the state-of-the-charge of the battery is acceptable for the life of the battery.**

   SQN CTS allow the use of battery charging current as a determination of battery operability. For Vital batteries, CTS 4.8.2.3.2.a.1 requires verification that the 125–volt battery parameters are within Category A limits of Table 4.8-2. CTS Table 4.8-2 includes Category A limits for specific gravity, modified by footnote (b), which provides an alternative method of verifying the battery state of charge by ensuring a battery charging current of less than 2 amps. SQN DG batteries are allowed the same alternative method of verifying the battery state of charge as demonstrated in CTS Table 4.8-1a, footnote (b).

2. **SQN verifies that the equipment that will be used to monitor float current under SR 3.8.6.1 will have the necessary accuracy and capability to measure electrical currents in the expected range. Additionally, SQN will verify that the minimum required procedural time to measure battery float current will be 30 seconds or as recommended by the float current measurement instrument manufacturer. This minimum float current measurement time is required to provide a more accurate battery float current reading.**

   SQN will incorporate the minimum float current measurement time

into the Bases for SR 3.8.6.1. The following sentences will be added to the SR, "The minimum required procedural time to measure battery float current will be 30 seconds or as recommended by the float current measurement instrument manufacturer. The minimum float current measurement time is required to provide a more accurate battery float current reading."

3. **SQN verifies that Vital battery room temperature is routinely monitored such that a room temperature excursion could reasonably be detected and corrected prior to the average battery electrolyte temperature dropping below the minimum required electrolyte temperature.**

   The SQN procedure for main control room operator rounds requires Vital battery room temperature monitoring at a minimum of once per 24 hours. The procedure contains temperature limits and instructions for actions should any temperatures deviate from the specified limits.

   Each set of DG batteries is located in a room with the associated DG. The SQN procedure for outside operator rounds requires temperature monitoring in the 2B-B DG room at a minimum of once per 12 hours. This temperature monitoring is considered to be a representative sample of all DG rooms. The procedure contains temperature limits and instructions for action should any temperatures deviate from the specified limits.

4. **SQN is proposing a CT longer than 72 hours for ITS 3.8.4, Required Action A.3, using the alternative justification method as allowed by TSTF−500, Section 4.7.1. The CT is consistent with SQN's UFSAR description of a means to charge the batteries available and that this capability includes power supplied from a source that is independent of the offsite power supply. A description of the power source follows:**

   The normal supply of DC current to the 125-volt vital battery boards is from the battery charger in each channel. There are six qualified, 125-volt battery chargers (one per battery and two spares). Each normally aligned 125-volt battery charger can be replaced by a spare charger. One spare charger is provided for every two normal chargers. Each charger supplies normal load demand on the battery board and maintains the associated battery in a charged state. Each charger is provided with manual transfer facilities to connect either a normal or an alternate AC input source. The normal and alternate sources are so arranged such that a loss of a single emergency AC onsite power supply does not leave a charger without an AC input source. Each charger is equipped with a DC voltmeter, DC ammeter, and charger failure alarm. Malfunction of a charger is annunciated in the main control room. Each charger is powered from the 480V

shutdown boards (normal and alternate) which upon loss of normal power are energized from the standby power system (standby power is from the associated diesel generator through the 480-volt shutdown board). Each battery is normally required to supply loads only during the time interval between loss of normal feed to its charger and the receipt of emergency power to the charger from the standby diesel generator.

5. **SQN is not proposing a CT greater than two hours for TS 3.8.4, Required Action B.1 or C.1.**

6. **The cell resistance limits in CTS 4.8.1.1.3.b.2 (DG batteries) and CTS 4.8.2.3.2.b.2 (Vital batteries) will be relocated to the Battery Monitoring and Maintenance Program required and described in proposed TS Section 5.5, Programs and Manuals. The connection resistance limit is 150 µOhms based on SQN battery calculations. The calculations illustrate that the minimum DC voltage is maintained for all required loads assuming a resistance of 150 µOhms per connection. For the DG batteries, the 150 µOhms connection resistance limit is for each connection, including each inter-cell, inter-tier, and terminal connection. For the Vital batteries, the 150 µOhms connection resistance limit is for each connection, including each inter-cell, inter-tier, and terminal connection.**

7. **SQN is proposing to adopt an allowance to perform the modified performance discharge test instead of the service test. For the Vital batteries, SQN verifies that the modified performance discharge test completely encompasses the load profile of the battery service test and that it adequately confirms the intent of the service test to verify the battery capacity to supply the design basis load profile.**

   For the DG batteries, SR 3.8.4.3 and associated SR 3.8.6.7 will be new surveillance requirements. SQN will verify the procedures developed for the DG modified performance discharge test completely encompasse the load profile of the battery service test and that it adequately confirms the intent of the service test to verify the battery capacity to supply the design basis load profile.

8. **Monitoring of battery parameters (i.e., specific gravity, electrolyte level, cell temperature, float voltage, connection resistance, and physical condition) will be relocated to the licensee-controlled program, required and described in TS Section 5.5, Programs and Manuals, and titled the Battery Monitoring and Maintenance Program.**

9. **SQN verifies that plant procedures will require verification of the selection of the pilot cell or cells when performing SR 3.8.6.2.**

   ITS Section 5.5.15, Battery Monitoring and Maintenance Program, a.3. states, "In lieu of RG 1.129, Regulatory Position 2, Subsection 5.2,

’Inspections,’ the following shall be used: ‘Where reference is made to the pilot cell, pilot cell selection shall be based on the lowest voltage cell in the battery.’” Therefore, in order to comply with technical specifications, procedures will reflect this requirement.

The FSAR revisions were included with the ITS submittal letter as Enclosure 9.

Response Date/Time	**4/1/2014 2:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Roger Scott** **Gerald Waig**
Added By	**Scott Bowman**
Date Added	**4/1/2014 1:31 PM**
Date Modified	
Modified By	

C&D TECHNOLOGIES, INC.
Power Solutions

1400 Union Meeting Road
Blue Bell, PA 19422
Phone: (215) 775-1314
Fax: (215) 619-7887

Sent via Email to: sbseal@tva.gov

August 9, 2013

Mr. Scott Seal
Sequoyah Nuclear Plant
Tennessee Valley Authority

Subject: Use of Float Current to Determine Operability

Dear Scott:

The following statements are based on a battery temperature of 77F.

For the LCUN-33 batteries, after a discharge, when the float current drops to less than or equal to 2 amps, the battery should be at least 98% recharged.

For the KCR-7 batteries, after a discharge, when the float current drops to less than or equal to 1 amp, the battery should be at least 98% recharged.

This relationship will not change as the batteries age.

These values of float current are also valid if the float voltage has been adjusted to compensate for battery temperatures that are above or below 77F. See C&D's Installation and Operating Manual (RS-1476) at the following link for recommended temperature compensation factors.

http://cdtechno.com/pdf/ref/rs_1476_0610.pdf

I hope that this information meets your needs. If you require any additional information, please contact me.

Regards,

Larry A. Carson

Larry A. Carson
Nuclear Product Manager
C&D Technologies, Inc.

Licensee Response/NRC Response/NRC Question Closure

Id	**15**
NRC Question Number	**GMW-002**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**4/24/2014**
Notification	**Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lisa Regner** **Gerald Waig**
Added By	**Gerald Waig**
Date Added	**4/24/2014 2:02 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**15**
NRC Question Number	**GMW-003**
Category	**Technical**
ITS Section	**3.8**
ITS Number	**3.8.1**
DOC Number	**L-5**
JFD Number	
JFD Bases Number	
Page Number(s)	**31 of 638**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Vijay Goel**
Conf Call Requested	**N**
NRC Question	**Proposed ITS 3.8.1.13 incorporates changes to CTS 4.8.1.1.2.d.6.c that are similar to those described in TSTF-400, revision 1, "Clarification of Surveillance Requirement on Bypass of noncritical DG Automatic Trips" and are described in the discussion of changes as less restrictive administrative (LA) changes. As discussed in a letter to the Technical Specification Task Force dated July 20, 2009, (ADAMS Accession Number ML091910541), the NRC staff no longer supports the position reflected in TSTF Traveler 400-A, revision 1. Please provide a detailed technical justification for the proposed ITS SR 3.8.1.13 changes.**
Attach File 1	
Attach File 2	
Issue Date	**3/21/2014**
Added By	**Gerald Waig**
Date Modified	**3/25/2014 1:58 PM**
Modified By	**Ray Schiele**
Date Added	**3/21/2014 2:07 PM**
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id	**11**
NRC Question Number	**GMW-003**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**TSTF-400, Revision 1 was incorporated into NUREG-1431, Revision 4. NUREG–1431 SR 3.8.1.13 requires verifying that the DG's noncritical automatic trips are bypassed on an actual or simulated ESF actuation signal. CTS 4.8.1.1.2.d.6.c) requires verifying that all DG trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the shutdown board and/or safety injection actuation signal. SQN is adopting SR 3.8.1.13. As discussed in LA05 of the ITS submittal, the critical trips identified in CTS (engine overspeed and generator differential) are being relocated to the SQN UFSAR.** **As stated in the enclosure to the letter from the NRC to the Technical Specification Task Force (TSTF) dated July 20, 2009, (ADAMS Accession Number ML091910541), "Information such as a list of EDG protective actuation signal trips that are defined as critical and non-critical should, in these cases, be relocated to the plant Updated Final Safety Analysis Report (UFSAR), either directly or incorporated by reference." The SQN UFSAR already contains a list of critical and non-critical DG trips in Section 8.3.1.1.** **Additionally, the enclosure states, in part, that the revision to RG 1.9 reflects the NRC staff's current guidance regarding the testing of EDG critical protective actuation relays. The revision contains explicit guidance that the NRC staff considers testing of EDG critical trips as necessary. Current testing ensures that the automatic DG trips are automatically bypassed, except engine overspeed and generator differential, in emergency mode. The DG critical protective trips are tested to verify that they perform their intended function.** **Based on meeting the two issues addressed in the NRC letter to the TSTF, it is appropriate that SQN adopt SR 3.8.1.13 in NUREG-1431, Rev. 4.**
Response Date/Time	**4/4/2014 12:30 AM**
Closure Statement	
Question Closure Date	

Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Gerald Waig**
Added By	**Scott Bowman**
Date Added	**4/4/2014 11:30 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**18**
NRC Question Number	**GMW-003**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Revised pages for ITS submittal.pdf** (27KB)
Attachment 2	
Response Statement	**This response supplements the previous SQN response to RAI GMW-003. During the weekly discussion with NRC reviewers, the NRC expressed that the previous response was not totally sufficient. SQN has reviewed our response and decided to make the following changes to the ITS conversion submittal:** **Enclosure 9 will be retitled, List of Final Safety Analysis Report (FSAR) Descriptions for TSTF-500 and TSTF-400. The table will be updated with Item 11 stating, "Describes that DG tests verify that the critical protective trips that are not automatically bypassed perform their intended function." The due date will be upon implementation.** **A draft markup regarding this change is attached.**
Response Date/Time	**5/6/2014 2:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Robert Elliott** **Vijay Goel** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Gerald Waig**
Added By	**Scott Bowman**
Date Added	**5/6/2014 1:39 PM**
Date Modified	
Modified By	

ENCLOSURE 9

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

List of ~~Required~~ Final Safety Analysis Report (FSAR) Descriptions For TSTF-500 and TSTF-400

LIST OF ~~REQUIRED~~ FINAL SAFETY ANALYSIS REPORT (FSAR) DESCRIPTIONS FOR TSTF-500 AND TSTF-400

The following table identifies FSAR descriptions for the Diesel Generator and Vital Batteries required by Sequoyah Nuclear Plant, Units 1 and Unit 2, as part of the adoption of TSTF-500, Revision 2. These changes will be included with the required implementation date in the Issuance of Amendment letter.

Additionally, an FSAR description for TSTF-400 is included.

REQUIRED FSAR DESCRIPTION	DUE DATE/EVENT
Sequoyah will change or verify that the FSAR: 1. Describes how a 5 percent design margin for the 125V Vital batteries corresponds to a 2 amp float current value indicating that the battery is 98 percent charged. 2. Describes how a 5 percent design margin for the Diesel Generator batteries corresponds to a 1 amp float current value indicating that the battery is 98 percent charged. 3. States that long term battery performance is supported by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 2.13 V per connected cell and that there are 60 connected cells in the battery, which corresponds to 127.8 V at the battery terminals. 4. Describes how the batteries are sized with correction margins that include temperature and aging and how these margins are maintained. 5. States the minimum established design limit for battery terminal float voltage. 6. States the minimum established design limit for electrolyte level. 7. States the minimum established design limit for electrolyte temperature. 8. Describes how each battery is designed with additional capacity above that required by the design duty cycles to allow for temperature variations and other factors. 9. Describes normal DC system operation (i.e., powered from the battery chargers) with the batteries floating on the system, and a loss of normal power to the battery charger describing how the DC load is automatically powered from the station batteries.	Upon implementation (applies to all)

10. Describes the availability of a means to charge the Vital Batteries and a description that the battery charger is capable of being supplied power from a power source that is independent of the offsite power supply. Specification 3.8.4, Required Action A.3	
11. Describes that DG tests verify that the critical protective trips that are not automatically bypassed perform their intended function.	Upon implementation

Licensee Response/NRC Response/NRC Question Closure

Id	**90**
NRC Question Number	**GMW-003**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Vijay Goel** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Khadijah Hemphill**
Date Added	**5/30/2014 10:50 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**16**
NRC Question Number	**GMW-004**
Category	**Technical**
ITS Section	**3.8**
ITS Number	**3.8.1**
DOC Number	**L-1**
JFD Number	
JFD Bases Number	
Page Number(s)	**77 of 638**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Vijay Goel**
Conf Call Requested	**N**
NRC Question	

Sequoyah has two units each with two 6.9 kV shutdown boards (two trains/unit). Most 6.9 kV ECCS loads are unitized; however some 480 V safety-related loads are shared between the units. The Sequoyah ITS, TS 3.8.1 (AC Sources – Operating), Condition I (New) appears to be the most limiting condition. This Condition corresponds to an electrical configuration where one unit (U1) is operating (Modes 1, 2, 3 or 4), and the other unit (U2) is shutdown (Modes 5 or 6); and one of two 6.9 kV shutdown boards (trains) of U2 is inoperable (due to an offsite circuit and the associated DG inoperable). This Condition is allowed for up to 7-days. During the 3/13/14 presentation at NRC headquarters, the licensee stated that Condition I is necessary to perform extensive preventive maintenance on the inoperable 6.9 kV shutdown board (train) which may take up to 7-days to complete.

Although TS 3.8.2 (AC Sources - Shutdown) allows a unit to be in Mode 5 or 6 with only one shutdown board (train) in-service, NRC staff is concerned that a station blackout can occur on the unit in Mode 5/6 if the in-service 6.9 kV shutdown board (train) also becomes inoperable due to a severe fault (such as an electrical fire) in the Operable in-service 6.9 kV switchgear (a single failure in any Mode is credible). Although, a similar scenario can also occur under the current TS (CTS), there is a high probability that the train undergoing maintenance can be readily restored to Operable (within 4 hours) – consistent with the Sequoyah SBO analysis. However, under the

proposed ITS, the train under maintenance may not be quickly recoverable (due to the nature and scope of the planned maintenance work) resulting in an SBO time substantially exceeding the 4-hour coping time. Sequoyah has not been analyzed for SBO conditions beyond the coping time.

With consideration of the above, please provide following information:

a) **A safety justification for ITS 3.8.1, Condition I (new) to allow one of two 6.9 kV switchgears (trains) of the shutdown unit (Modes 5 and 6) to be inoperable, for any reason (proposed ITS Condition I does not specify a reason), for up to 7-days.**

b) **Cleaning of the electrical shutdown board (train) was stated by the licensee at the 3/13/2014 meeting to be a once-per 10 to 12-year activity according to Electric Power Research Institute (EPRI) recommendation. Given that this preventative maintenance has significantly exceeded the EPRI recommended frequency, what assurance can be provided that while performing the maintenance on one shutdown board that the shutdown boards not yet cleaned will not fail or are not more susceptible to failure (e.g., arcing or flashover).**

c) **Details of the preventive maintenance which will be performed on the switchgears, and why it will take up to 7-days to perform maintenance on one train. When was the previous preventive maintenance performed on each shutdown board (train), and how long did it actually take to perform the maintenance on each 6.9 kV switchgear/train?**

d) **In the shutdown unit, a severe electrical fault on the in-service 6.9 kV train switchgear (while the other train switchgear is under extended maintenance up to 7 days) can result in a SBO exceeding the 4-hour coping time. Explain how the plant (with one unit operating and the other in shutdown) will cope with such a scenario. Provide a list of compensatory measures, which the licensee proposes to take if an extended SBO condition (up to 7 days) occurs in the shutdown unit.**

e) **The shutdown board cleaning requires the proposal of special TS Conditions, Required Actions, Completion Times, electrical distribution system configuration, compensatory actions, etc. due to the unique Sequoyah electrical system design. Explain why this seldom performed preplanned maintenance evolution is not proposed as a TS 3.10, Special Operation TS (see NUREG-1433/1434 as example) or why operation in Condition I is not limited by Note(s) to specify the shutdown bus cleaning and any special requirements/conditions necessary to perform this evolution.**

Attach File 1

Attach File 2	
Issue Date	**3/25/2014**
Added By	**Gerald Waig**
Date Modified	
Modified By	
Date Added	**3/25/2014 2:29 PM**
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Roger Scott** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id	**13**
NRC Question Number	**GMW-004**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 to GMW-004 4-7-14.pdf** (75KB)
Attachment 2	
Response Statement	Part A.

CTS 3.8.1.1 ACTION c provides actions for one inoperable offsite circuit and one inoperable DG and allows 12 hours to restore at least one of the inoperable AC sources to operable status before requiring the unit to be shut down and cooled down. ITS 3.8.1 ACTION F provides actions for one associated unit's offsite circuit inoperable concurrent with one associated unit's DG inoperable, and allows 12 hours to restore one of the inoperable AC sources to operable status. Therefore, the actions for an inoperable offsite circuit concurrent with an inoperable DG on the associated unit remain unchanged. However, ITS 3.8.1 ACTION I provides actions for one offsite circuit inoperable solely due to an inoperable offsite power source to an opposite unit's 6.9 kV Shutdown Board concurrent with one opposite unit's DG inoperable, and allows 7 days to restore one of the inoperable AC sources to operable status. In addition, a Note modifying ITS 3.8.1 ACTION I requires entry into the applicable Conditions and Required Actions of LCO 3.8.9 with no AC power source to an opposite unit's 6.9 kV Shutdown Board. These changes to the CTS reflect a change in focus from the effects of inoperable AC sources on the opposite unit, to the effects of inoperable equipment affected by the inoperable AC sources on the opposite unit.

As illustrated in Attachment 1, the SQN onsite Class 1E AC Electrical Distribution System supplies electrical power to two power trains shared between the two units. The core cooling and containment cooling system loads (e.g., Safety Injection (SI) pumps, Auxiliary Feedwater (AFW) pumps, Residual Heat Removal (RHR) pumps, Centrifugal Charging pumps, Containment Spray pumps, and Air Return System (ARS) fans) are unitized to the respective unit's 6.9 kV Shutdown Boards. However, other safety-related systems (e.g., Essential Raw Cooling Water (ERCW), Component Cooling (CCS), Emergency

Gas Treatment (EGTS), Auxiliary Building Gas Treatment, (ABGTS), and control room ventilation) are shared between the units. Therefore, the effects of an inoperable offsite power source or DG on an opposite unit's 6.9 kV Shutdown Board differ from the impacts of an inoperable offsite power source or DG on an associated unit's 6.9 kV Shutdown Board, due to the loads powered from the respective board.

For example, assuming SQN Unit 1 is operating in Mode 1, 2, 3, or 4, and Unit 2 is in Mode 5 or 6, if it is necessary to de-energize 6.9 kV Shutdown Board 2B-B, the redundant shared systems, required for Unit 1 that are powered from 6.9 kV Shutdown Board 2A-A, can be aligned prior to de-energizing the shutdown board to ensure no loss of safety function. If 6.9 kV Shutdown Board 2B-B is de-energized, the only equipment affected that Unit 1 is utilizing is ABGTS Fan B-B and 125 V vital battery charger IV. Upon removing the shutdown board from service, the applicable Conditions and Required Actions for the affected shared system LCOs will be entered, requiring restoration of the equipment in seven days. Therefore, the allowed seven days to restore either the offsite power source or the DG is consistent with the allowed outage time of the affected equipment. Similarly, if the de-energized 6.9 kV Shutdown Board is 2A-A, the affected equipment that Unit 1 is utilizing is ABGTS Fan A-A and 125 V vital battery charger III; each with a 7-day allowed outage time.

If SQN Unit 2 is operating in Mode 1, 2, 3, or 4, and Unit 1 is in Mode 5 or 6, and the de-energized 6.9 kV Shutdown Board is 1B-B, the impacted equipment that Unit 2 is utilizing is EGTS Fan B-B, control room air handling unit (CR AHU) B-B, and 125 V vital battery charger II; each with a 7 day allowed outage time. Similarly, if the de-energized 6.9 kV Shutdown Board is 1A-A, the impacted equipment that Unit 2 is utilizing is EGTS Fan A-A, CR AHU A-A and 125 V vital battery charger I; each with a 7 day allowed outage time.

The above examples assume the Ultimate Heat Sink (UHS) / Essential Raw Cooling Water (ERCW) license amendment request (LAR) is approved and the auxiliary control air compressor modification is implemented. If the UHS / ERCW LAR is not approved prior to ITS implementation, ITS LCO 3.8.9, Condition D would require declaring the associated required features inoperable, which would include an inoperable ERCW train with a Required Action to restore the train with a

Completion Time of 72 hours. If the auxiliary control air compressor modification is not implemented prior to ITS implementation, ITS LCO 3.8.9, Condition D would require declaring the associated required features inoperable, which would include an inoperable AFW train with a Required Action to restore the train with a Completion Time of 72 hours.

Therefore, the proposed change is acceptable because the provided actions affect restoration of the opposite unit's AC sources commensurate with the importance of maintaining these AC sources capable of supporting the associated unit's required feature(s).

Part B.

Although shutdown board preventive maintenance has exceeded EPRI recommendations, annual thermography and visual inspections of the boards are performed to identify any degraded conditions. These annual inspections have not identified any issues with the shutdown boards.

The shutdown boards are located in a clean, climate-controlled environment in the Auxiliary Building adjacent to the Main Control Room. The shutdown board room ventilation system maintains the room at a normal temperature range between 65°F and 80°F and a relative humidity range between 40% and 60%.

The two shutdown board rooms are separated by a concrete wall. One room contains the Unit 1 and Unit 2, A Train shutdown boards. The other room contains the B Train boards. Work performed on one shutdown board should have no effect on the opposite train's board.

In addition, as provided in SQN TS Change 96-08, Revision 1, dated October 8, 1998, with regard to the request to extend the allowed outage time for an inoperable DG from 72 hours to 7 days, TVA agreed to the following procedural controls: 1) ensure that the DG limiting condition for operation action will not be voluntarily entered when severe weather is expected, 2) ensure that switchyard activities are controlled to minimize the potential impact to offsite power sources when a DG is out-of-service, and 3) ensure that safety systems in the same train of the same unit associated with a DG are not scheduled for removal from service when the DG is scheduled to be out-of-service. The redundant safety systems of the opposite train are required to be operable when the associated DG is inoperable.

For offsite power, procedural controls are in place during outage planning and execution to ensure risk is assessed and managed. Assessments are performed during outage execution to maintain defense-in-depth. Shutdown Risk Assessments consider, in part, the degree of redundancy of structures, systems and components, the duration of activities, switchyard activities that could have an impact on offsite power, and the impact of external events, such as weather and grid reliability.

Based on the environment where the shutdown boards are located, the physical separation of the shutdown boards, the procedural controls in place when a DG or offsite circuit is removed from service, and the fact that no issues have been discovered during annual inspections of the shutdown boards, it is unlikely that preventive maintenance activities on one shutdown board would increase the likelihood of failure in another shutdown board.

Part C.

Preventive maintenance activities associated with the 6.9kV Shutdown Boards include:

- **Insulation resistance testing (megger)**
- **Inspection and micro-ohm resistance measurements**
- **Inspecting, cleaning, and lubricating primary stabs**
- **Cleaning rear compartments by vacuuming and wiping buses and insulators with alcohol and rags**
- **Pulling rear panels of potential transformer cabinets, inspecting components, and lubricating bus connections**
- **Performing additional work orders to address equipment issues (e.g., cell switch replacements, fuse block replacements) as allowed within the Completion Times**

Current planning has an estimated duration (i.e., time the Shutdown Board is not OPERABLE) to perform preventive maintenance on a single 6.9 kV Shutdown Board and two associated 480 V Shutdown Boards as approximately 100 hours. This estimate includes the following activities:

12 hours for tagging and preparation
20 hours for 6.9 kV Shutdown Board maintenance
26 hours for first 480 V Shutdown Board maintenance
26 hours for second 480 V Shutdown Board maintenance
12 hours for tagging removal and restoration
4 hours for DG warm-up
1 hour for DG testing

The boards were last cleaned during a dual unit outage that began March 1, 1993, and extended into June 1993. During that time, all four 6.9 kV shutdown boards were cleaned. The scheduled duration for the work associated with each 6.9 kV shutdown board was 20 hours. However, the actual duration of the work activities cannot be determined.

Part D.

According to 10 CFR 50.2, a station blackout (SBO) is a complete loss of AC electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency AC power system.). The situation described in GMW-004, part d) does not meet the definition of an SBO. The plant would still have offsite and onsite power available to one unit, and there would be no associated turbine trip on the operating unit.

In the proposed scenario, the shutdown unit would not have offsite and onsite AC power at the time of failure of the second shutdown board. The operating unit would not have two operable offsite circuits, because the offsite circuits would be unable to supply power to a complete train. However, the operating unit would have two functional offsite circuits able to supply power to the operating unit shutdown boards. Additionally, the operating unit would have two operable DGs.

ITS 3.4.7, RCS Loops – MODE 5, Loops Filled, requires that a minimum of one RHR loop remain operable and in operation with two SGs having a level of ≥ 21% narrow range. The requirements of ITS 3.4.7 must be met prior to removing a 6.9 kV Shutdown Board from service in Mode 5. ITS 3.9.7, Refueling Cavity Water Level, requires that refueling cavity water level be maintained ≥ 23 ft above the top of reactor vessel flange during movement of irradiated fuel assemblies within containment. ITS 3.9.7 must be met prior to removing a 6.9 kV Shutdown Board from service in Mode 6. Therefore, one of the following conditions must be met prior to removing the 6.9 kV Shutdown Board from service:

1) **One RHR loop operable and in operation, all RCS loops filled, and two SGs available with ≥ 21% narrow range level in Mode 5 or,**
2) **Greater than or equal to 23 ft of water above the top of the reactor vessel flange in Mode 6.**

SQN procedures address the situation described in GMW-004, part d). With one unit operating (for this discussion, Unit 1) and the other unit (Unit 2) in a shutdown condition, a failure of the in-service Unit 2 6.9 kV switchgear would require operators to enter abnormal operating procedure (AOP)-P.06, Loss of U-2 Electrical Shutdown Boards. Step 1 of AOP-P.06 requires operators to determine if any Unit 2 6.9 kV Shutdown Board is energized. With the loss of both Unit 2 Shutdown Boards, operators are directed to enter AOP-R.03, RHR System Malfunctions, while continuing the performance of AOP-P.06. AOP-P.06 will direct the restoration of one Unit 2 6.9 kV Shutdown Board while AOP-R.03 provides the instructions necessary for protecting the reactor core in the event of a loss of RHR cooling.

Actions taken in AOP-R.03 will;

1) **Ensure containment closure**
2) **Stop all fuel movement**
3) **Ensure all dilution activities stopped**
4) **Establish secondary heat sink heat removal if the RCS is intact**
5) **Establish gravity fill from RWST for maintenance of RCS level and heat removal if the RCS is not intact**

Unit 1, the operating unit, would remain in operation upon the loss of the Unit 2 6.9 kV switchgear. Unit 1 Technical Specifications require a shutdown due to the loss of required shared systems powered from a Unit 2 shutdown board, although Unit 1 continues to have adequate electrical sources required for safe shutdown. The loss of power to both of the Unit 2 shutdown boards only affects shared systems for Unit 1.

Part E.
The required shutdown board cleaning will initially be performed on a schedule of one set of boards every refueling outage until all boards have been cleaned. Afterwards, the board cleaning will be performed during refueling outages as required to maintain the industry-recommended maintenance on the boards. Between scheduled refueling outages, the potential exists where a shutdown board might require maintenance whereby the shutdown board is de-energized for some amount of time. Without the new ITS 3.8.1 Condition I, this unscheduled maintenance would require a dual unit outage, if the board could not be restored within 12 hours.

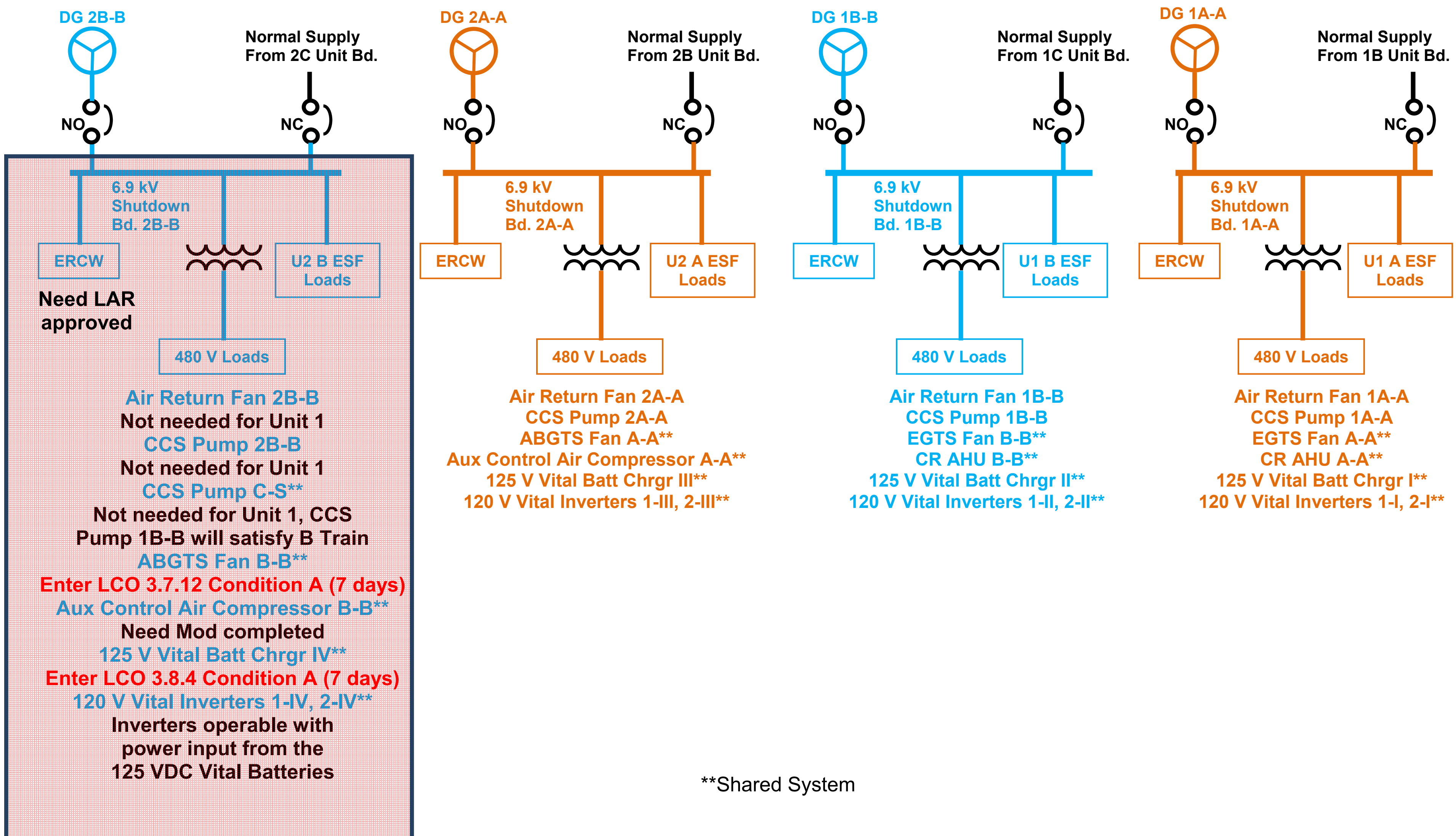
There are no special requirements/conditions necessary to use LCO 3.8.1 Condition I. Per LCO 3.0.2, upon failure to meet an LCO, the Required Actions of the associated Conditions shall be met. Therefore, with an offsite circuit inoperable due to an inoperable power source to an opposite unit shutdown board and an opposite unit DG inoperable, not only is LCO 3.8.1 Condition I entered, but also LCO 3.8.1 Conditions C and D are entered. Required Actions associated with Conditions C and D ensure correct breaker alignment and power availability for each offsite circuit, the other DGs are operable, and redundant required features remain operable. If another offsite circuit or DG becomes inoperable during this time, LCO 3.0.3 is entered and a unit shutdown would commence in one hour. If a redundant required feature becomes inoperable during this time, the applicable Conditions and Required Actions for that required feature would be entered in four hours, most likely resulting in an entry into LCO 3.0.3, if the redundant required feature cannot be restored in four hours.

Additionally, if the inoperable offsite circuit and inoperable DG result in no AC power to an opposite unit shutdown board, then the applicable Conditions and Required Actions of LCO 3.8.9 would be entered. LCO 3.8.9, Condition D requires the immediate declaration that the associated required features are inoperable. If the opposite unit is in Mode 5 without RCS loops filled, then the applicable Conditions and Required Actions of LCO 3.4.8 are entered. If the opposite unit is in Mode 6 with a water level < 23 ft above the top of the reactor vessel flange, then the applicable Conditions and Required Actions of LCO 3.9.6 are entered.
Therefore, no notes modifying LCO 3.8.1 Condition I are required to ensure the appropriate actions are taken to maintain safety of either unit.

Response Date/Time	**4/8/2014 5:15 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Ray Schiele** **Roger Scott** **Gerald Waig**
Added By	**Scott Bowman**
Date Added	**4/8/2014 4:04 PM**
Date Modified	

Modified By

Shutdown Board 2B-B De-Energized;
Unit 1 in Mode 1-4 (Unit 2 in Mode 5 or 6)



**Shared System

Attachment 1

Licensee Response/NRC Response/NRC Question Closure

Id	**91**
NRC Question Number	**GMW-004**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Vijay Goel** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Khadijah Hemphill**
Date Added	**5/30/2014 10:50 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**17**
NRC Question Number	**GMW-005**
Category	**Technical**
ITS Section	**3.2**
ITS Number	**3.2.1**
DOC Number	**A-2**
JFD Number	
JFD Bases Number	
Page Number(s)	**39 of 249**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**ben parks**
Conf Call Requested	**N**
NRC Question	**Proposed ITS 3.2.1, Heat Flux Hot Channel Factor F_Q(X,Y,Z) utilizes a modified STS 3.2.1B, "Heat Flux Hot Channel Factor F_Q(Z) (RAOC W(Z) Methodology)." In Nuclear Safety Advisory Letter (NSAL) 09-5, "Relaxed Axial Offset Control FQ Technical Specification Actions," Revision 1, dated September 23, 2009, Westinghouse discusses a deficiency in the RAOC W (Z) Methodology that can result in a non-conservative TS 3.2.1, Heat Flux Hot Channel Factor F_Q(Z).** **a. Does the CTS 3/4.2.2, Heat Flux Hot Channel Factor-F_Q(X,Y,Z) currently use the above identified Westinghouse RAOC Methodology?** **b. Explain why use of STS 3.2.1B, Westinghouse RAOC W(Z) methodology, is appropriate for Sequoyah. Include in your discussion how the use of BAW-10163P-A, Revision 0, "Core Operating Limit Methodology for Westinghouse Designed PWRs," June 1989, precludes the deficiency described in NSAL 09-05 Revision1.**
Attach File 1	
Attach File 2	
Issue Date	**3/25/2014**
Added By	**Gerald Waig**
Date Modified	
Modified By	
Date Added	**3/25/2014 3:41 PM**

Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Matthew Hamm** **Khadijah Hemphill** **Lisa Regner** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id	**12**
NRC Question Number	**GMW-005**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	

Part A.

Sequoyah (SQN) CTS 3/4.2.2, Heat Flux Hot Channel Factor F_Q (X,Y,Z) does not use Westinghouse RAOC Methodology. SQN is currently licensed for the use of the methodology specified in BAW- 10163PA, Core Operating Limit Methodology for Westinghouse Designed PWRs. (Safety Evaluation report dated March 1989)

Part B.1

The use of STS 3.2.1B, Westinghouse RAOC W(Z) is not appropriate for SQN. As discussed in ITS 3.2.1, Justification for Deviation(JFD) 2, (Enclosure 2, Volume 7 page 51 of 249), "The RAOC-W(Z) methodology and the Specification designator "B" are deleted because they are unnecessary. (Only one Heat Flux Hot Channel Factor Specification is used 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, the CAOC-FXY and CAOC-W(Z) methodology Specifications (ISTS 3.2.1A and 3.2.1C) are not used and are not shown." The RAOC W(Z) page was used as a template to overlay the corresponding SQN methodology, as specified in BAW- 10163PA, Core Operating Limit Methodology for Westinghouse Designed PWRs. NUREG-1431 does not currently contain an ISTS 3.2.1 template for this methodology.

Part B.2

SQN operates with a core power distribution control and monitoring method that is similar to the Westinghouse RAOC methodology. Therefore, Westinghouse Nuclear Safety Advisory Letter (NSAL) 09-5, Rev. 1 (Relaxed Axial Offset Control FQ Technical Specification Actions) was reviewed relative to the methodology used at SQN (i.e., BAW-10163PA) to determine whether changes to Technical Specification actions were required. The evaluation included a review of the NRC-approved power distribution methodology (i.e., BAW-10163PA) and power peaking surveillance requirements in the Technical Specifications. The upper and lower portions of the core are limiting due to the nature of axial xenon distributions. For the %AFD Margin to be negative in the central axial portion of the core, the

core would not be performing as expected and multiple progressive indications that the core is not performing as expected would be present. However, in case of such an event, the BAW-10163 methodology establishes cycle-specific conservative values of $PSLOPE^{AFD}$ and $NSLOPE^{AFD}$ to conservatively reduce the AFD limits as specified in ITS 3.2.1 Actions B.1and B.2. The cycle-specific values of $PSLOPE^{AFD}$ and $NSLOPE^{AFD}$ are reported in the Core Operating Limits Report. The values of $PSLOPE^{AFD}$ and $NSLOPE^{AFD}$ are calculated over the full range of AFD. The combination of the available excess margin in the central axial portion of the core and the reduction in AFD limit lines in response to a negative % AFD Margin ensures the fuel design limits are protected. A sufficiently negative %AFD Margin and the corresponding actions would force the AFD limit lines to cross and effectively reduce core thermal power.

Therefore, the BAW-10163PA methodology is adequate to preserve the safety analysis bases and to preclude a violation of fuel design limits even if a 1% reduction in AFD is insufficient to produce a 1% reduction in FQM (X,Y,Z) in the middle elevation of the active core. No unacceptable risk for Sequoyah was seen to result from the condition identified in NSAL 09-5, Rev. 1. Consequently, no Technical Specification changes were deemed necessary.

Response Date/Time	**4/8/2014 5:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman Michelle Conner Robert Elliott Matthew Hamm Khadijah Hemphill Lynn Mynatt Lisa Regner Ray Schiele Gerald Waig**
Added By	**Scott Bowman**
Date Added	**4/8/2014 3:51 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**17**
NRC Question Number	**GMW-005**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**4/29/2014**
Notification	**Michelle Conner** **Robert Elliott** **Ravinder Grover** **Khadijah Hemphill** **Lisa Regner** **Gerald Waig**
Added By	**Gerald Waig**
Date Added	**4/29/2014 10:20 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**19**
NRC Question Number	**GMW-006**
Category	**Technical**
ITS Section	**3.8**
ITS Number	
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Vijay Goel**
Conf Call Requested	**N**

NRC Question

In Response to the NRC RAI # GMW-004, Part d), the licensee stated, in part, as follows:

SQN procedures address the situation described in GMW-004, part d). With one unit operating (for this discussion, Unit 1) and the other unit (Unit 2) in a shutdown condition, a failure of the in-service Unit 2 6.9 kV switchgear would require operators to enter abnormal operating procedure (AOP)-P.06, Loss of U-2 Electrical Shutdown Boards. Step 1 of AOP-P.06 requires operators to determine if any Unit 2 6.9 kV Shutdown Board is energized. With the loss of both Unit 2 Shutdown Boards, operators are directed to enter AOP-R.03, RHR System Malfunctions, while continuing the performance of AOP-P.06. AOP-P.06 will direct the restoration of one Unit 2 6.9 kV Shutdown Board while AOP-R.03 provides the instructions necessary for protecting the reactor core in the event of a loss of RHR cooling.

Actions taken in AOP-R.03 will;

1) Ensure containment closure
2) Stop all fuel movement
3) Ensure all dilution activities stopped
4) Establish secondary heat sink heat removal if the RCS is intact
5) Establish gravity fill from RWST for maintenance of RCS level and heat removal if the RCS is not intact

In the above response, the licensee failed to identify as to how it will provide power necessary for the Actions in AOP-R.03 (especially for above Actions listed as Items 1 through 4 of AOP-R.03), with the loss of both Unit 2 6.9 kV Shutdown Boards up to 7 days.

Please provide complete details of the backup power and equipment which the licensee proposes to provide for the Actions in AOP-R.03 (especially for above Actions listed as Items 1 through 4 of AOP-R.03), with the loss of both Unit 2 6.9 kV Shutdown Boards up to 7 days (one failed due to an electrical bus fault and therefore not recoverable, and the other under 7 days maintenance). Also, describe whether the above actions (listed as Items 1 through 4 of AOP-R.03) will be adequate to keep the reactor in a safe shutdown condition up to 7 days.

Attach File 1	
Attach File 2	
Issue Date	**4/29/2014**
Added By	**Khadijah Hemphill**
Date Modified	
Modified By	
Date Added	**4/29/2014 7:39 AM**
Notification	**Scott Bowman** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Roger Scott** **Gerald Waig**

Licensee Response/NRC Response/NRC Question Closure

Id **113**

NRC Question Number **GMW-006**

Select Application **Licensee Response**

Attachment 1

Attachment 2

Response Statement

During a public meeting between the NRC staff and TVA personnel on May 22, 2014, regarding the SQN ITS Conversion LAR, TVA requested clarification of RAI GMW-006, with regard to the TVA response to RAI GMW-004, part d. During the discussion, it became apparent that the NRC's concerns focused on the availability of alternate residual heat removal methods in MODE 5 or 6 with a 6.9 kV Shutdown Board removed from service for scheduled maintenance with a coincident failure of the associated unit'sOPERABLE 6.9 kV Shutdown Board. Although the probability of a failure of the OPERABLE 6.9 kV Shutdown Board during the time that scheduled maintenance is being performed on the out-of-service 6.9 kV Shutdown Board is remote, to address this concern, TVA proposes the following license condition be added to Facility Operating License DPR-77 and Facility Operating License DPR-79, for Sequoyah Nuclear Plant, Units 1 and 2, respectively:

<u>Unit 1</u>

(30) Upon implementation of Amendment No. XXX, scheduled preventive maintenance, requiring de-energizing 6.9 kV Shutdown Board 1A-A, 1B-B, 2A-A, or 2B-B, shall only be performed under the following conditions:

(1) For 6.9 kV Shutdown Board 1A-A or 1B-B:
- **a. All fuel has been removed from the Unit 1 reactor vessel, or**
- **b. Unit 1 is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty.**

(2) For 6.9 kV Shutdown Board 2A-A or 2B-B:
- **a. All fuel has been removed from the Unit 2 reactor vessel, or**
- **b. Unit 2 is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty.**

<u>Unit 2</u>

(24) Upon implementation of Amendment No. XXX, scheduled preventive maintenance, requiring de-energizing 6.9 kV Shutdown Board 1A-A, 1B-B, 2A-A, or 2B-B, shall only be performed under the following

conditions:

(1) For 6.9 kV Shutdown Board 1A-A or 1B-B:
- **a. All fuel has been removed from the Unit 1 reactor vessel, or**
- **b. Unit 1 is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty.**

(2) For 6.9 kV Shutdown Board 2A-A or 2B-B:
- **a. All fuel has been removed from the Unit 2 reactor vessel, or**
- **b. Unit 2 is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty.**

Response Date/Time	**6/9/2014 5:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman Michelle Conner Robert Elliott Vijay Goel Khadijah Hemphill Andrew Hon Ray Schiele**
Added By	**Scott Bowman**
Date Added	**6/9/2014 4:27 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**189**
NRC Question Number	**GMW-006**
Select Application	**NRC Response**
Attachment 1	
Attachment 2	
Response Statement	**With regard to scheduled preventive maintenance to be performed on a 6.9 kV shutdown board - when the associated Unit is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty; please provide justification that the Unit will remain in safe shutdown condition assuming no auxiliary power available from both the 6.9 kV shutdown boards associated with the Unit in Mode 6.**
Response Date/Time	**7/16/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman Michelle Conner Vijay Goel Khadijah Hemphill Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**
Added By	**Khadijah Hemphill**
Date Added	**7/16/2014 2:36 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**308**
NRC Question Number	**GMW-006**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**mmm**

Based on the Staff's response to RAI GMW-006, the following information is provided to demonstrate that when the Unit is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty, the Unit will remain in a safe shutdown condition assuming no auxiliary power from both 6.9 kV shutdown boards (i.e., one 6.9 kV shutdown board is unavailable due to maintenance activities and the other 6.9 kV shutdown board is assumed to have a catastrophic failure, simultaneously).

In response to GMW-006, TVA proposed adding a license condition to facilitate performing preventive maintenance on each unit's 6.9 kV shutdown boards. The license condition would allow scheduled preventive maintenance to be performed when all fuel has been removed from the unit's reactor vessel or when the unit is in MODE 6, with cavity level greater than 23 feet, subsequent to core empty. It is expected that 6.9 kV shutdown board preventive maintenance would begin during the core empty period and possibly extend into a period where the unit has entered MODE 6 once fuel has been placed back into the unit's reactor vessel. The time the unit is expected to be in MODE 6 with a 6.9 kV shutdown board unavailable as a result of maintenance is short; however, SQN performed a conservative engineering evaluation to determine how long the unit would remain in a safe shutdown condition with no action taken to restore core cooling or to add water to the refueling cavity.

The evaluation is based on the following assumptions:

- **The water temperature at the time of the loss of auxiliary power is 100ºF.**
- **The unit's core has been fully reloaded with a decay heat value of 4 megawatts (this value was based on Unit 2's last core reload).**
- **The refueling cavity water level is 23 feet above the reactor vessel flange.**
- **When the water level reaches the reactor vessel flange, the core is no longer in a safe condition. The core is still covered, although the remaining water volume is relatively insignificant. For the evaluation, it is conservatively assumed the core is uncovered when the water level reaches the reactor vessel flange.**

The evaluation determined that the time to raise the refueling cavity water temperature to the boiling point, and subsequently boil off the water down to the reactor vessel flange is 7.5 days.

Therefore, assuming no actions are taken to restore core cooling or to add water to the refueling cavity, the Unit will remain in a safe shutdown condition for at least 7 days if all auxiliary power is lost.

Response Date/Time	**9/2/2014 7:45 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman Michelle Conner Vijay Goel Khadijah Hemphill Andrew Hon Lynn Mynatt Ray Schiele**
Added By	**Scott Bowman**
Date Added	**9/2/2014 6:44 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**322**
NRC Question Number	**GMW-006**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**9/3/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Khadijah Hemphill**
Date Added	**9/3/2014 4:19 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**18**
NRC Question Number	**KAB001**
Category	**Technical**
ITS Section	**3.3**
ITS Number	
DOC Number	
JFD Number	
JFD Bases Number	
Page Number (s)	
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Steve Wyman**
Conf Call Requested	**N**
NRC Question	**(This is a follow-up question to the response to CSS-001.)** **The reactor coolant pump under frequency trip identifies response times for solid state protection system (SSPS) components in part of the calculation. Many plants have begun to install updated versions of the SSPS cards. Newer versions of the cards have a different response time than the original design cards.** **Please re-affirm that the response times for Sequoyah's SSPS cards in the calculation are correct.**
Attach File 1	
Attach File 2	
Issue Date	**4/24/2014**
Added By	**Khadijah Hemphill**
Date Modified	
Modified By	
Date Added	**4/24/2014 3:46 PM**
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Lynn Mynatt** **Lisa Regner** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**19**
NRC Question Number	**KAB001**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**SQN has not installed newer versions of the SSPS cards and the response times listed in the reactor coolant pumps' under frequency calculation submitted in response to RAI CSS-001 are correct.**
Response Date/Time	**5/6/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Robert Elliott** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/6/2014 1:41 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**21**
NRC Question Number	**KAB001**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/13/2014**
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Khadijah Hemphill**
Date Added	**5/13/2014 2:07 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**20**
NRC Question Number	**KAB002**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**M-4**
JFD Number	
JFD Bases Number	
Page Number(s)	**64**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 64 of Enclosure 2, Volume 8, M02 provides the discussion of proposed changes to surveillance requirements for the interlocks and logic for the reactor trip instrumentation. The current technical specifications (CTS) require that the total interlock function shall be demonstrated operable at least once per 18 months during channel calibration testing of each channel affected be interlock position. In addition, CTS Table 4.3-1 requires a channel calibration at least once per 18 months for the reactor trip system interlocks (functions 22.a, 22.c, 22.d, 22.e, and 22.f.) M02 states, "…The purpose of the CTS Table 4.3.1.1.2 CHANNEL FUNCTIONAL TEST requirement is to ensure the Reactor Trip System interlocks are OPERABLE. The change is acceptable because the proposed Surveillance Frequency will require performance of the test every 92 days on a STAGGERED TEST BASIS." The quoted M02 statement above refers to a table that does not exist in the CTS, to a channel functional test that is not applicable to the reactor trip system interlocks, and discusses performing the test every 92 days on a staggered test basis. These sentences are not very clear about which functions and which test(s) are being discussed. Please provide further clarification on these statements.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date	

Modified	
Modified By	
Date Added	**5/1/2014 2:25 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**20**
NRC Question Number	**KAB002**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Revised DOC M02 Markup.pdf** (11KB)
Attachment 2	
Response Statement	**ITS 3.3.1 discussion of change (DOC) M02 will be revised to show that the CTS 4.3.1.1.2 interlock logic test requirement is to ensure the Reactor Trip System interlocks are OPERABLE.** **In ITS, the interlock logic test becomes SR 3.3.1.5, an ACTUATION LOGIC TEST.** **See Attachment 1 for ITS DOC M02 markup.**
Response Date/Time	**5/6/2014 2:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/6/2014 1:45 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors as does the CHANNEL CALIBRATION. The ITS ACTUATION LOGIC TEST (ALT), CHANNEL OPERATIONAL TEST (COT), and TRIP ACTUATING DEVICE OPERATION TEST (TADOT) provide similar tests with the addition that the COT and TADOT include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. This change is designated as more restrictive because the ITS requires an additional acceptance criteria that is not currently required in the CTS.

M02 CTS 4.3.1.1.2 requires the logic for the interlocks be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. ITS Table 3.3.1-1 Function 19 (Automatic Trip Logic) and Function 16.B (Reactor Trip System Interlock, Low Power Trips Block, P-7) require the performance of an ACTUATION LOGIC TEST every 92 days on a STAGGERED TEST BASIS (ITS SR 3.3.1.5). This changes the CTS by changing the Surveillance Frequency from prior to each reactor startup unless performed during the preceding 92 days to every 92 days on a STAGGERED TEST BASIS and explicitly states this requirement for CTS Functional Unit 22.B (Reactor Trip System Interlock, Low Power Trips Block, P-7).

The purpose of the CTS ~~Table~~ 4.3.1.1.2 ~~CHANNEL FUNCTIONAL TEST~~ interlock logic test requirement is to ensure the Reactor Trip System interlocks are OPERABLE. The change is acceptable because the proposed Surveillance Frequency will require performance of the test every 92 days on a STAGGERED TEST BASIS. This ensures that each interlock train is tested every 184 days, even when the unit is operating. Currently, the test could be performed only once in an 18-month cycle. This change is designated as more restrictive since the ITS will require the test to be performed more frequently than in the CTS.

M03 CTS Table 3.3-1, Functional Units 22.C (Power Range Neutron Flux, P-8), 22.D (Power Range Neutron Flux, P-10), and 22.F (Power Range Neutron Flux, P-9), and ACTION 8 require action be taken with less than the Minimum Number of Channels OPERABLE. CTS Functional Units 22.C, 22.D, and 22.F, Minimum Channels OPERABLE column requires three (3) channels to be OPERABLE for each Functional Unit. ITS Table 3.3.1-1, Functions 16.c (Power Range Neutron Flux, P-8), 16.e (Power Range Neutron Flux, P-10), and 16.d (Power Range Neutron Flux, P-9), Required Channels column, requires four (4) channels to be OPERABLE with ITS LCO 3.3.1 ACTION A requiring action taken if one or more required channels are inoperable. This changes the CTS by requiring more P-8, P-9, and P-10 interlock channels to be OPERABLE and by providing ACTIONS to take when the additional required channel is inoperable.

The purpose of the ITS LCO 3.3.1 channel requirement is to ensure that appropriate compensatory actions are taken if any of the installed channels are inoperable. This change is acceptable because the channel requirement in ITS Table 3.3.1-1 will ensure that all of the installed RPS channels are required OPERABLE and will ensure sufficient channels are required OPERABLE to account for a single failure. The proposed ITS ACTION for when one channel is inoperable will ensure that the inoperable channel is not allowed to be inoperable

Licensee Response/NRC Response/NRC Question Closure

Id	**41**
NRC Question Number	**KAB002**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:17 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**21**
NRC Question Number	**KAB003**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**M-5**
JFD Number	
JFD Bases Number	
Page Number (s)	**65**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 65 of Enclosure 2, Volume 8, M05 provides the discussion of the proposed change that add required actions d.3 and e.2 and compares it to actions 2 and 6 in Sequoyah's CTS. M05 states, "Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed." twice in the discussion. However, action 2 states:** **With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the following conditions are satisfied:** **a. The inoperable channel is placed in the tripped condition within 6 hours.** **b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.** **c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.** **The note in discussion M05 seems to conflict with what is stated in CTS action 2. Please explain the note in further detail or remove the note from M05.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	

Modified By	
Date Added	**5/1/2014 2:30 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**22**
NRC Question Number	**KAB003**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Revised ITS DOC M05.pdf** (15KB)
Attachment 2	
Response Statement	**The parenthetical note "(Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed)" was added to clarify that Unit 1 CTS Action 2 only states "and" not "and/or," as discussed in the sentence. Removing the parenthetical note does not impact discussion of change (DOC) M05. Therefore, the note for ITS 3.3.1 DOC M05 will be removed from the DOC and submittal.** **See Attachment 1 for ITS DOC M05 markup.**
Response Date/Time	**5/14/2014 4:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/14/2014 3:23 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

for an indefinite period. This change is also acceptable because the Required Actions and Completion Times 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. This change is designated as more restrictive because more stringent LCO requirements and associated Required Actions and Completion Times are being applied in the ITS than were applied in the CTS.

M04 CTS Table 3.3-1 requires Functional Units 1 (Manual Reactor Trip), 6.A (Source Range, Neutron Flux, Startup), 20.B (Reactor Trip Breakers – Shutdown), and 21.B (Automatic Trip Logic – Shutdown) channels to be OPERABLE with the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel as stated in Table 3.3-1 Note *. CTS Table 4.3-1 specifies the same note, Note *, for designating when the Surveillance Requirements for these Functional Units are required. ITS Table 3.3.1-1, including Footnote (a), requires the Functions 1 (Manual Reactor Trip), 5 (Source Range Neutron Flux), 17 (Reactor Trip Breakers (RTBs)), 18 (Reactor Trip Breaker Undervoltage and Shut Trip Mechanisms), and 19 (Automatic Trip Logic) channels to be OPERABLE in MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or with one or more rods not fully inserted. This changes the CTS by requiring the Manual Reactor Trip and the Source Range Neutron Flux Functions to be OPERABLE when one or more rods are not fully inserted irrespective of the condition of the reactor trip breakers or the Control Rod Drive System. The change concerning the details of the reactor trip breakers are discussed in DOC LA04 and the change that adds MODES 3, 4, and 5 is discussed in DOC A12.

The purpose of the RTS instrumentation is that it must be OPERABLE so that the rods can be inserted in response to a reactivity excursion. This change is acceptable because it provides appropriate requirements for when one or more control rods are not fully inserted. This change is designated as more restrictive because it requires the Manual Reactor Trip and the Source Range Neutron Flux Functions to be OPERABLE when one or more rods are not fully inserted irrespective of the condition of the reactor trip breakers or the Control Rod Drive System.

M05 CTS Table 3.3-1 ACTIONS 2 and 6 provide the actions to be taken when their associated Functional Units OPERABLE channels are one less than the number of channels listed in the Total Number of Channels column. These ACTIONS state that STARTUP (similar to ITS MODE 2) and/or POWER OPERATION (similar to ITS MODE 1) may proceed, provided the listed conditions are satisfied ~~(Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed~~). However, no action is specified if the listed conditions are not satisfied. Therefore, CTS 3.0.3 applies requiring the plant to be in MODE 3 in 7 hours. Under similar conditions, ITS 3.3.1 Required Actions D.3 and E.2 require the unit to be in MODE 3 within 6 hours. This changes the CTS by reducing the amount of time allowed to place the unit outside the LCO Applicability.

The purpose of CTS Table 3.3-1 ACTIONS 2 and 6 is to provide the actions to be taken when their associated Functional Units OPERABLE channels are one less

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DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

than the number of channels listed in the Total Number of Channels column. CTS 3.0.3 provides actions when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements. Because CTS Table 3.3-1 ACTIONS 2 and 6 do not provide any further actions if those listed are not satisfied, CTS 3.0.3 would be entered. CTS 3.0.3 states that within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply. CTS Table 3.3-1 ACTIONS 2 and 6 state that STARTUP and POWER OPERATION (MODES 2 and 1, respectively) may proceed if the listed conditions are satisfied ~~(Note: Unit 1 CTS Table 3.3-1 ACTION 2 only states, in part, that STARTUP and POWER OPERATION may proceed)~~. Therefore, in accordance with CTS 3.0.3, the MODE reached first that the Specification does not apply would be MODE 3. CTS 3.0.3 states, in part, that within one hour, action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in at least HOT STANDBY (MODE 3) within the next 6 hours (a total of 7 hours to reach MODE 3). ITS LCO 3.3.1 Required Actions D.3 and E.2 allow 6 hours to reach MODE 3. This change is acceptable because the time allowed to reach MODE 3 from full power conditions can be accomplished in an orderly manner and without challenging plant systems. This change is designated as more restrictive because it reduces the amount of time within which the plant must be placed outside the LCO Applicability.

M06 With one Intermediate Range Neutron Flux channel inoperable, CTS Table 3.3-1 ACTION 3.b, when above the P-6 interlock (Block of the Source Range Reactor Trip) and below 5% of RTP, requires the restoration of the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% RTP. In addition, CTS Table 3.3-1 ACTION 3.c allows unlimited operation with an inoperable Intermediate Range Neutron Flux channel above 5% RTP. ITS 3.3.1 ACTION F, which provides actions for when one Intermediate Range Neutron Flux channel is inoperable, requires either a reduction of THERMAL POWER to < P-6 within 24 hours or the increase in THERMAL POWER to > P-10 within 24 hours. Refer to L09 for discussion of allowing the change in THERMAL POWER to exit MODE of Applicability as an option to restoring the inoperable Intermediate Range channel. This changes the CTS by limiting the time the unit can operate with an inoperable Intermediate Range Neutron Flux channel above 5% RTP but below the P-10 interlock to 24 hours.

This change is acceptable because a time limit is placed on the length of time the unit may operate with an inoperable Intermediate Range Neutron Flux channel at a power level above 5% RTP and below the P-10 interlock. The requirement to allow 24 hours to restore the instrument to OPERABLE status or to leave the Applicability for when the equipment is required to be OPERABLE is reasonable because a protection function has been significantly degraded and 24 hours is a reasonable period to allow for a slow and controlled power adjustment. This change is more restrictive because it restricts the time the unit can operate with an inoperable Intermediate Range Neutron Flux channel.

M07 CTS Table 3.3-1 does not provide an ACTION for two inoperable Intermediate Range Neutron Flux channels when less than or equal to 10% RTP; therefore, CTS 3.0.3 must be entered. CTS 3.0.3 allows 1 hour to initiate action and 6 additional hours for the unit to be placed in MODE 3 (HOT STANDBY). ITS 3.3.1

Licensee Response/NRC Response/NRC Question Closure

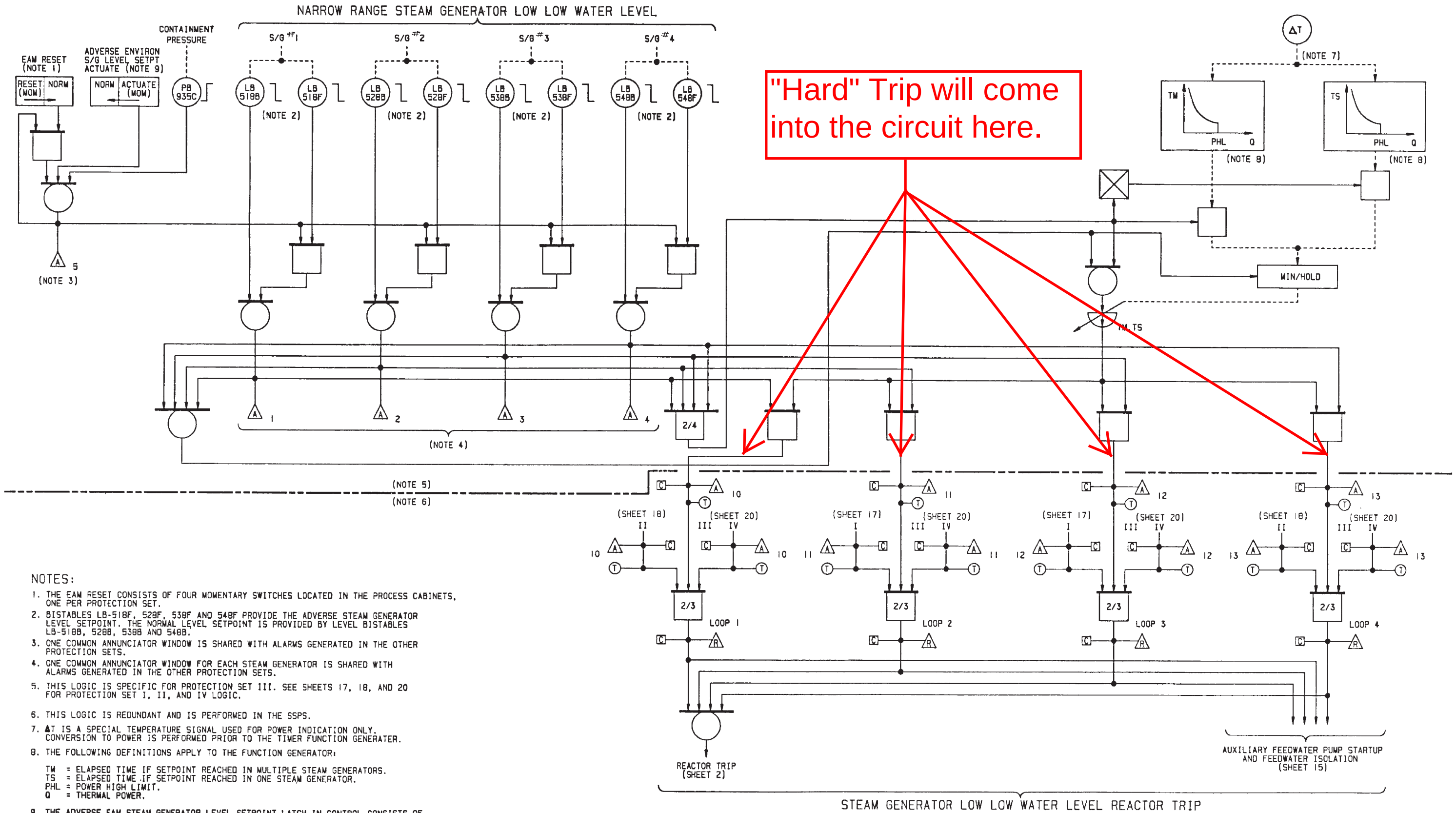
Id	**42**
NRC Question Number	**KAB003**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:18 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**22**
NRC Question Number	**KAB004**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**L-11**
JFD Number	
JFD Bases Number	
Page Number(s)	**89**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 89 of Enclosure 2, Volume 8, L11 provides the discussion of the proposed change that adds required action t.2, which allows placing the affected protection set, steam generator water level low low channel in trip within 6 hours. L12 states, "Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary." Please explain how placing the steam generator low low level channel in trip, removes the RCS ΔT TTD circuitry**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:32 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**25**
NRC Question Number	**KAB004**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Logic and Training Material.pdf** (217KB)
Attachment 2	**Attachment 2 ITS DOC L11 for RAI KAB004.pdf** (933KB)
Response Statement	**Placing the Steam Generator Low-Low Level Channel in trip does not literally remove the RCS ΔT TTD circuitry from the active portion of the circuit, as stated in the discussion of change (DOC) L11. In the signal flowpath for Steam Generator Low-Low Level Channel trip, the manual trip is downstream of the RCS ΔT TTD input into the Eagle 21 System, thereby negating the RCS ΔT TTD effect on the trip circuit. The RCS ΔT TTD input remains in the circuit, but with the manual trip in place, the RCS ΔT TTD has no effect on the circuit. Therefore, DOC L11 will be revised to replace the sentence, "Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary," with, "Once the channel is placed in the tripped condition, the RCS ΔT TTD input has no effect on the circuit, and these actions are no longer necessary.** **Attachment 1 contains UFSAR Figure 7.2.1-1, Sheet 19 and the Operations training material associated with the Eagle 21 System. The UFSAR figure depicts the logic for "Automatic" trips and is annotated to show where the manual trip would impact the circuit. The Eagle 21 material illustrates the location of the manual trip within the Eagle 21 System.** **See Attachment 2 for a draft ITS DOC L11 markup.**
Response Date/Time	**5/16/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/16/2014 12:28 PM**
Date Modified	
Modified By	



NOTES:

1. THE EAM RESET CONSISTS OF FOUR MOMENTARY SWITCHES LOCATED IN THE PROCESS CABINETS, ONE PER PROTECTION SET.
2. BISTABLES LB-518F, 528F, 538F AND 548F PROVIDE THE ADVERSE STEAM GENERATOR LEVEL SETPOINT. THE NORMAL LEVEL SETPOINT IS PROVIDED BY LEVEL BISTABLES LB-518B, 528B, 538B AND 548B.
3. ONE COMMON ANNUNCIATOR WINDOW IS SHARED WITH ALARMS GENERATED IN THE OTHER PROTECTION SETS.
4. ONE COMMON ANNUNCIATOR WINDOW FOR EACH STEAM GENERATOR IS SHARED WITH ALARMS GENERATED IN THE OTHER PROTECTION SETS.
5. THIS LOGIC IS SPECIFIC FOR PROTECTION SET III. SEE SHEETS 17, 18, AND 20 FOR PROTECTION SET I, II, AND IV LOGIC.
6. THIS LOGIC IS REDUNDANT AND IS PERFORMED IN THE SSPS.
7. ΔT IS A SPECIAL TEMPERATURE SIGNAL USED FOR POWER INDICATION ONLY. CONVERSION TO POWER IS PERFORMED PRIOR TO THE TIMER FUNCTION GENERATER.
8. THE FOLLOWING DEFINITIONS APPLY TO THE FUNCTION GENERATOR:

   TM = ELAPSED TIME IF SETPOINT REACHED IN MULTIPLE STEAM GENERATORS.
   TS = ELAPSED TIME IF SETPOINT REACHED IN ONE STEAM GENERATOR.
   PHL = POWER HIGH LIMIT.
   Q = THERMAL POWER.
9. THE ADVERSE EAM STEAM GENERATOR LEVEL SETPOINT LATCH-IN CONTROL CONSISTS OF FOUR MOMENTARY SWITCHES LOCATED IN THE PROCESS CABINETS, ONE SWITCH PER PROTECTION SET.

SEQUOYAH NUCLEAR PLANT
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FIGURE 7.2.1-1 SHEET 19
FUNCTIONAL DIAGRAMS ENVIRONMENT ALLOWANCE MOD & TRIP TIME DELAY LOGIC
(REVISED BY AMENDMENT 13)

PROCAD MAINTAINED DRAWING
THIS CONFIGURATION CONTROL DRAWING IS MAINTAINED BY THE SQN CAD UNIT AND IS PART OF THE TVA PROCADAM DATABASE.

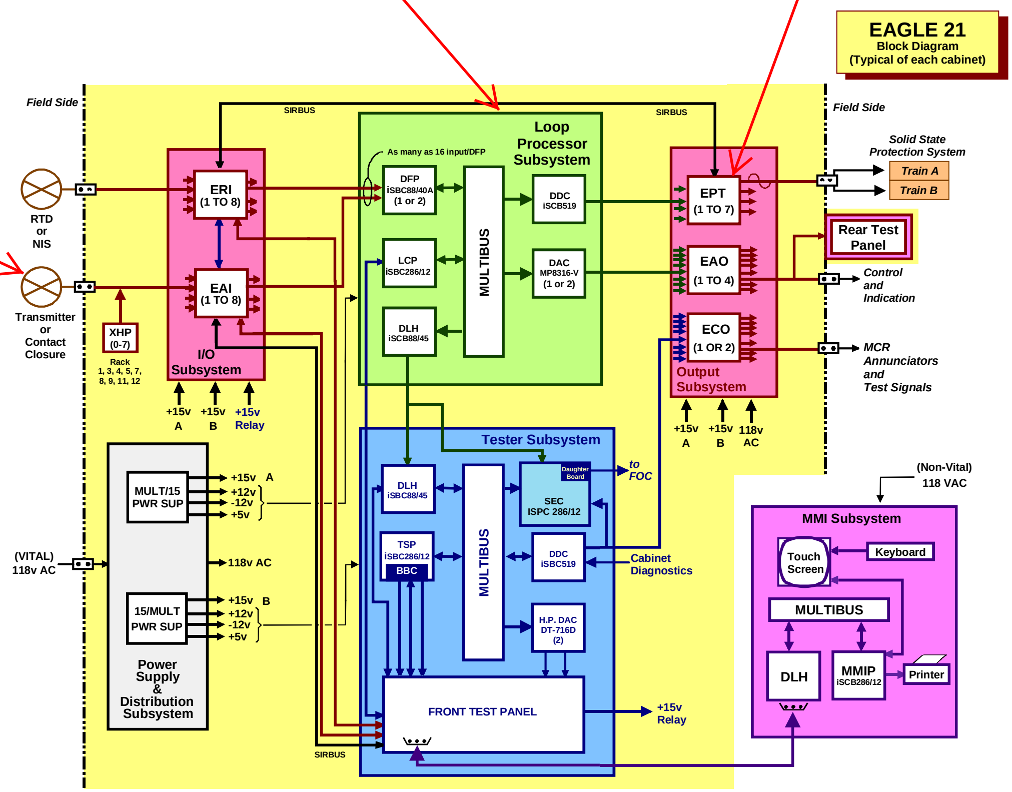
Eagle 21 Overview

All calculations done in Loop Processor

Manual Trip done in EPT Board

Block diagram The block diagram of an Eagle 21 channel is shown below. Only one channel is shown, other channels are similar.

Field Inputs, such as S/G Level, Containment Pressure and Delta T



Loop Processor Subsystem

Loop Processor Function Description

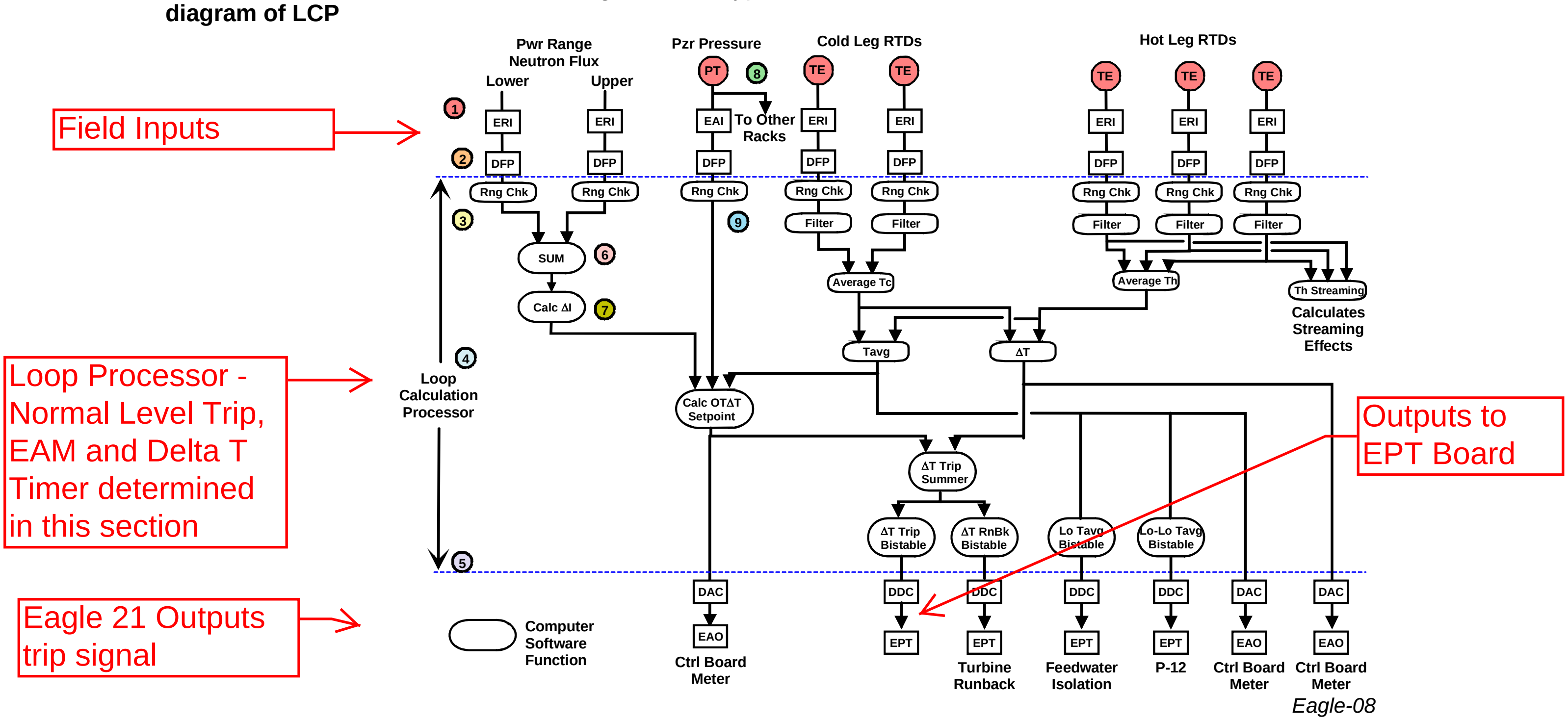
The Loop Processor Subsystem performs the following major functions:

- Converts analog inputs to numerical representations.
- Automatically calibrates the input signals and corrects for differences.
- Provides dynamic compensation (like OPΔT, OPΔT calculations)
- Provides algebraic calculations (Tavg).
- Compares inputs to trip setpoint values and provides a trip signal to the partial trip bistable (maintains reactor trip setpoints in memory for comparison).
- Provides analog outputs for indication and control.
- Provides data to Tester Subsystem.

Loop Processor Subsystem

Functional diagram of LCP

The functional diagram for a typical LCP is shown below.



Output Subsystem

Description

The EPT board will remove 118 VAC from SSPS, which would indicate a trip condition

The Output Subsystem consists of three types of output cards:

- EPT - Eagle Partial Trip board. This board provides 118 VAC output to SSPS except for 21 channel receive 118V AC from SSPS.
- EAO - Eagle Analog Output board. This board provides isolation from and out to the Foxbro control and indications racks.
- ECO - Eagle Contact Output board. This board provides outputs from the tester sysystem.

Diagram of EPT board

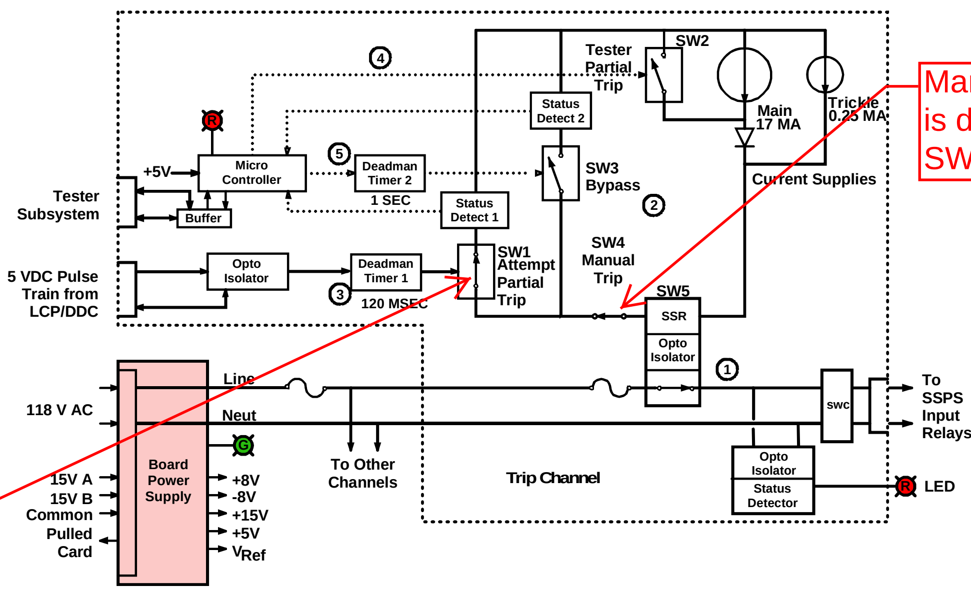
Each EPT board has four EPT circuits. The purpose of the Eagle Partial Trip Boards (EPT) is to:

- control the 118 VAC to the SSPS input relays.
- allow the tester subsystem to remotely place any or all of the four channels in a trip or bypass state.
- allow personnel to manually place any channel in a trip condition.
- supply channel status information to the tester subsystem and provide local indication of the output state of each channel

The EPT circuit is described below.

Level Trip after the timer has timed out would come here from LCP

Then, SW1 would open initiating the trip on this channel



Manual "Hard" Trip is done by opening SW4

Manual "Hard" Trip

Automatic Trip from Eagle LCP

The current flow to maintain SW5 energized flows in a loop as follows:

- the main current supply which provides the power to maintain SW5 energized,
- through Manual Trip switch SW4 which is used to manually trip the channel,
- to Attempt Partial Trip switch SW1 which is the automatic trip signal from the LCP/DDC for the channel,

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

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. The Intermediate Range Neutron Flux channels are required to mitigate events within the proposed Applicability of above the P-6 interlock and below the P-10 interlock. While the unit is within the Applicability of the LCO, the other Intermediate Range Neutron Flux channel can perform the required safety function. With the unit outside the proposed Applicability of the equipment, the equipment is not credited in any transient, other instrumentation is available to mitigate the consequences of a transient event. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L10 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-1, ACTION 7 for Functional Unit 18.B (Turbine Trip, Turbine Stop Valve Closure) states, "With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours." ITS ACTION L for Function 14.b (Turbine Trip, Turbine Stop Valve Closure) provides similar actions but adds a Note that states, "The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels." This changes the CTS by allowing an inoperable Turbine Trip, Turbine Stop Valve Closure channel to be bypassed up to 12 hours to perform surveillance testing of other channels.

The purpose of CTS Table 3.3-1, ACTION 7 is to allow some time to restore the inoperable channel prior to placing the channel in a tripped condition or requiring a unit shutdown. The Required Actions Note allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the testing of channels than was allowed in the CTS.

L11 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 10 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP. This action is applicable to CTS Functional Unit 14.C (Main Steam Generator Water Level—Low-Low, RCS Loop ΔT). ITS 3.3.1 Required Action T.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

Once the channel is placed in the tripped condition, the RCS ΔT TTD input has no effect on the circuit, and these actions are no longer necessary.

The purpose of CTS Table 3.3-1 ACTION 10 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection sets Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level Low-Low channels in the tripped condition. ~~Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary.~~ The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. This change is considered less restrictive because an addition required action is added to the CTS that provides acceptable protection when a channel is inoperable.

L12 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 11 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Functional Unit 14.D (Main Steam Generator Water Level—Low-Low, Containment Pressure (EAM)). ITS 3.3.1 Required Action S.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

The purpose of CTS Table 3.3-1 ACTION 11 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level -- Low-Low level channels in the tripped condition. Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low

Licensee Response/NRC Response/NRC Question Closure

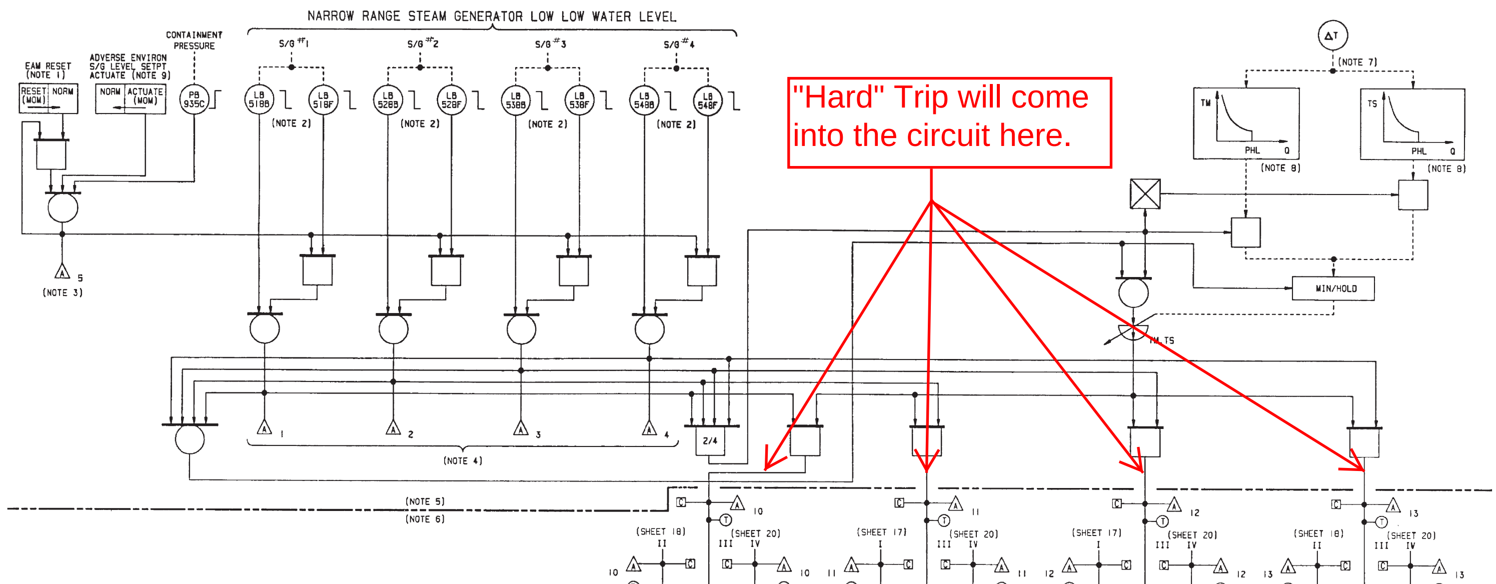
Id	**88**
NRC Question Number	**KAB004**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:43 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**23**
NRC Question Number	**KAB005**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**L-12**
JFD Number	
JFD Bases Number	
Page Number(s)	**89**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 89 of Enclosure 2, Volume 8, L12 provides the discussion of the proposed change that adds required action s.2, which allows placing the affected protection set, steam generator water level low low channel in trip within 6 hours. L12 states, "Once the channel is placed in the tripped condition the Steam Generator Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary." Please explain how placing the steam generator low low level channel in trip, removes the Steam Generator Low-Low EAM/Adverse circuitry.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:33 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**26**
NRC Question Number	**KAB005**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Logic and Training Material KAB005.pdf** (227KB)
Attachment 2	**Attachment 2 revised DOC L12.pdf** (918KB)
Response Statement	**Placing the Steam Generator Low-Low Level Channel in trip does not literally remove the EAM/Adverse circuitry from the active portion of the circuit, as stated in the discussion of change (DOC) L12. In the signal flowpath for Steam Generator Low-Low Level Channel trip, the manual trip is downstream of the Steam Generator Low-Low EAM/Adverse input into the Eagle 21 System, thereby negating the Steam Generator Low-Low EAM/Adverse effect on the trip circuit. The Steam Generator Low-Low EAM/Adverse input remains in the circuit, but with the manual trip in place, the Steam Generator Low-Low EAM/Adverse has no effect on the circuit. Therefore, DOC L12 will be revised to replace the sentence, "Once the channel is placed in the tripped condition the Steam Generator Water Level Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level Low-Low channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and these actions are no longer necessary," with, "Once the channel is placed in the tripped condition, the Steam Generator Low-Low EAM/Adverse input has no effect on the circuit, and these actions are no longer necessary."** **Attachment 1 contains UFSAR Figure 7.2.1-1, Sheet 19 and the Operations training material associated with the Eagle 21 System. The UFSAR figure depicts the logic for "Automatic" trips and is annotated to show where the manual trip would impact the circuit. The Eagle 21 material illustrates the location of the manual trip within the Eagle 21 System.** **See Attachment 2 for a draft ITS DOC L12 markup.**
Response Date/Time	**5/16/2014 1:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/16/2014 12:35 PM**
Date Modified	
Modified By	



NOTES:

1. THE EAM RESET CONSISTS OF FOUR MOMENTARY SWITCHES LOCATED IN THE PROCESS CABINETS, ONE PER PROTECTION SET.
2. BISTABLES LB-518F, 528F, 538F AND 548F PROVIDE THE ADVERSE STEAM GENERATOR LEVEL SETPOINT. THE NORMAL LEVEL SETPOINT IS PROVIDED BY LEVEL BISTABLES LB-518B, 528B, 538B AND 548B.
3. ONE COMMON ANNUNCIATOR WINDOW IS SHARED WITH ALARMS GENERATED IN THE OTHER PROTECTION SETS.
4. ONE COMMON ANNUNCIATOR WINDOW FOR EACH STEAM GENERATOR IS SHARED WITH ALARMS GENERATED IN THE OTHER PROTECTION SETS.
5. THIS LOGIC IS SPECIFIC FOR PROTECTION SET III. SEE SHEETS 17, 18, AND 20 FOR PROTECTION SET I, II, AND IV LOGIC.
6. THIS LOGIC IS REDUNDANT AND IS PERFORMED IN THE SSPS.
7. ΔT IS A SPECIAL TEMPERATURE SIGNAL USED FOR POWER INDICATION ONLY. CONVERSION TO POWER IS PERFORMED PRIOR TO THE TIMER FUNCTION GENERATER.
8. THE FOLLOWING DEFINITIONS APPLY TO THE FUNCTION GENERATOR:

   TM = ELAPSED TIME IF SETPOINT REACHED IN MULTIPLE STEAM GENERATORS.
   TS = ELAPSED TIME IF SETPOINT REACHED IN ONE STEAM GENERATOR.
   PHL = POWER HIGH LIMIT.
   Q = THERMAL POWER.
9. THE ADVERSE EAM STEAM GENERATOR LEVEL SETPOINT LATCH-IN CONTROL CONSISTS OF FOUR MOMENTARY SWITCHES LOCATED IN THE PROCESS CABINETS, ONE SWITCH PER PROTECTION SET.

SEQUOYAH NUCLEAR PLANT
FINAL SAFETY ANALYSIS REPORT

FIGURE 7.2.1-1 SHEET 19
FUNCTIONAL DIAGRAMS ENVIRONMENT ALLOWANCE MOD & TRIP TIME DELAY LOGIC
(REVISED BY AMENDMENT 13)

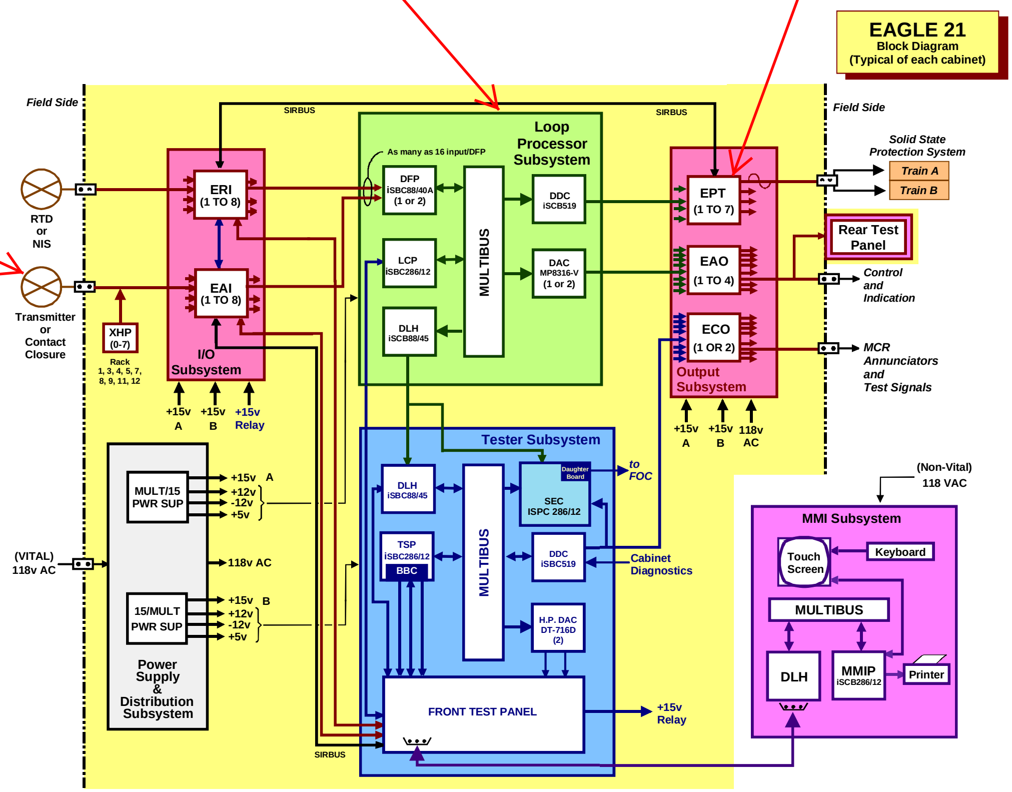
Eagle 21 Overview

All calculations done in Loop Processor

Manual Trip done in EPT Board

Block diagram The block diagram of an Eagle 21 channel is shown below. Only one channel is shown, other channels are similar.

Field Inputs, such as S/G Level, Containment Pressure and Delta T



Loop Processor Subsystem

Loop Processor Function Description

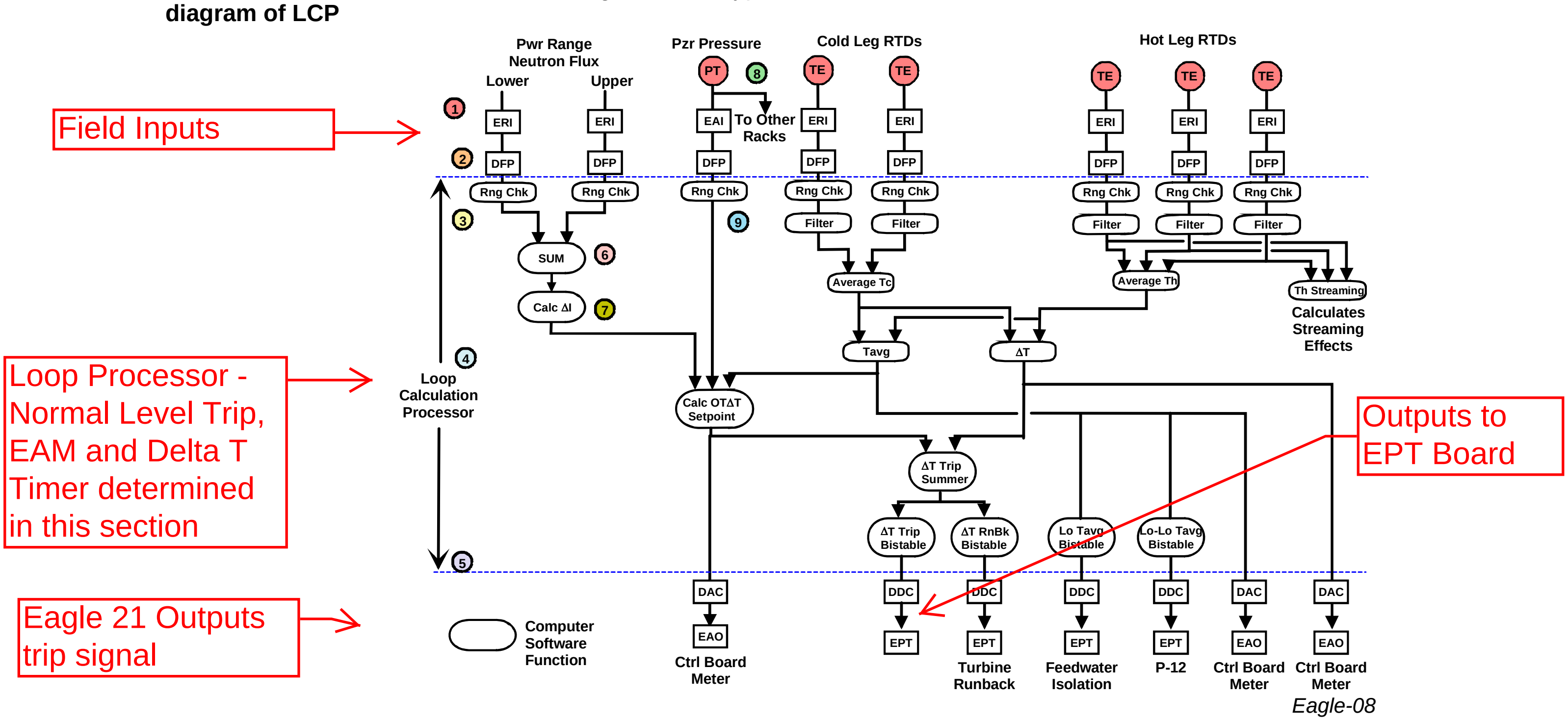
The Loop Processor Subsystem performs the following major functions:

- Converts analog inputs to numerical representations.
- Automatically calibrates the input signals and corrects for differences.
- Provides dynamic compensation (like OPΔT, OPΔT calculations)
- Provides algebraic calculations (Tavg).
- Compares inputs to trip setpoint values and provides a trip signal to the partial trip bistable (maintains reactor trip setpoints in memory for comparison).
- Provides analog outputs for indication and control.
- Provides data to Tester Subsystem.

Loop Processor Subsystem

Functional diagram of LCP

The functional diagram for a typical LCP is shown below.



Output Subsystem

Description

The EPT board will remove 118 VAC from SSPS, which would indicate a trip condition

The Output Subsystem consists of three types of output cards:

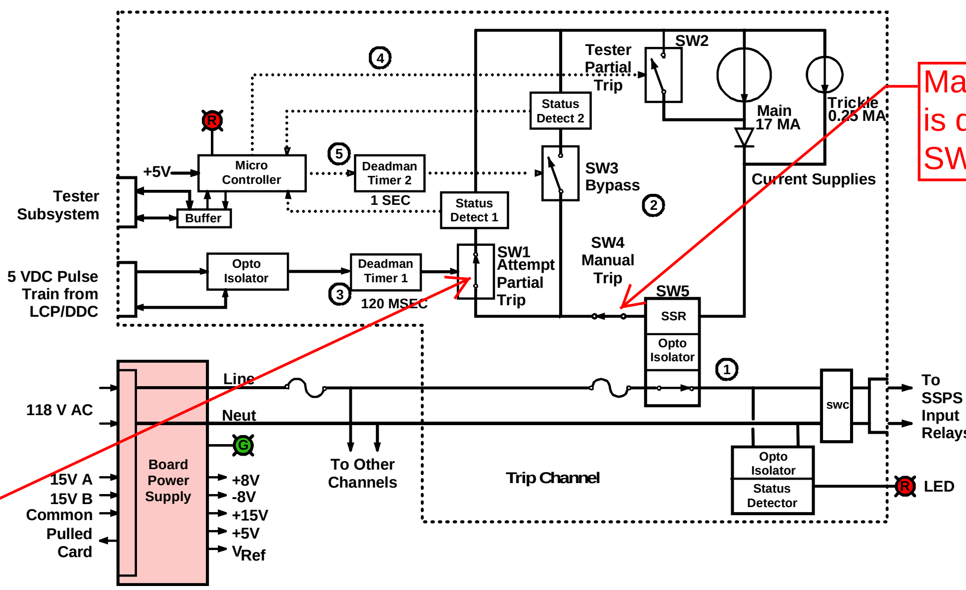
- EPT - Eagle Partial Trip board. This board provides 118 VAC output to SSPS except for 21 channel receive 118V AC from SSPS.
- EAO - Eagle Analog Output board. This board provides isolation from and out to the Foxbro control and indications racks.
- ECO - Eagle Contact Output board. This board provides outputs from the tester sysystem.

Diagram of EPT board

Each EPT board has four EPT circuits. The purpose of the Eagle Partial Trip Boards (EPT) is to:

- control the 118 VAC to the SSPS input relays.
- allow the tester subsystem to remotely place any or all of the four channels in a trip or bypass state.
- allow personnel to manually place any channel in a trip condition.
- supply channel status information to the tester subsystem and provide local indication of the output state of each channel

The EPT circuit is described below.



Manual "Hard" Trip is done by opening SW4

Level Trip after the timer has timed out would come here from LCP

Then, SW1 would open initiating the trip on this channel

Manual "Hard" Trip

Automatic Trip from Eagle LCP

The current flow to maintain SW5 energized flows in a loop as follows:

- the main current supply which provides the power to maintain SW5 energized,
- through Manual Trip switch SW4 which is used to manually trip the channel,
- to Attempt Partial Trip switch SW1 which is the automatic trip signal from the LCP/DDC for the channel,

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

channel in trip instead of adjusting the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP with the same Completion Time. This changes the CTS by adding an alternative to adjusting the TTD threshold power level for zero seconds.

The purpose of CTS Table 3.3-1 ACTION 10 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the affected protection sets Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay to 0% RTP. With the trip time delay adjusted to zero seconds the additional operational margin that allows the operator time to recover SG Water level is removed and the associated SG Water level channel is returned to OPERABLE. If the threshold power level for zero seconds time delay is not adjusted from 50% RTP to 0% RTP within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level Low-Low channels in the tripped condition. Once the channel is placed in the tripped condition the RCS ΔT TTD circuitry is removed from the active portion of the Steam Generator Low-Low Level channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20 and this action is no longer necessary. The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. This change is considered less restrictive because an addition required action is added to the CTS that provides acceptable protection when a channel is inoperable.

L12 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 ACTION 11 requires that with the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse). This action is applicable to CTS Functional Unit 14.D (Main Steam Generator Water Level—Low-Low, Containment Pressure (EAM)). ITS 3.3.1 Required Action S.2 allows an alternative of placing the Steam Generator Water Level -- Low-Low channel in trip instead of adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse) with the same Completion Time for placing the channel in trip. This changes the CTS by adding an alternative to adjusting the Steam Generator Water Level -- Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse).

Once the channel is placed in the tripped condition, the Steam Generator Low-Low EAM/Adverse input has no effect on the circuit, and these actions are no longer necessary.

The purpose of CTS Table 3.3-1 ACTION 11 is to limit the maximum time allowed for maintenance activities, in which the channel is unavailable prior to adjusting the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint to the same value as Steam Generator Water Level -- Low-Low (Adverse). If the Steam Generator Water Level -Low-Low (EAM) channels trip setpoint is not adjusted to the same value as Steam Generator Water Level -- Low-Low (Adverse) within the specified Completion Time this proposed change allows placing the affected protection sets SG Water Level -- Low-Low level channels in the tripped condition. ~~Once the channel is placed in the tripped condition the Steam Generator Water Level -- Low-Low EAM/Adverse circuitry is removed from the active portion of the Steam Generator Water Level -- Low-Low~~

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

~~channel, reference UFSAR Figure 7.2.1-1, Sheets 17 through 20, and these actions are no longer necessary.~~ The action of tripping the channel provides the protection sets input to the 2/3 logic gates located on UFSAR Figure 7.2.1-1 Sheet 19. This change is considered less restrictive because an additional required action is added to the CTS that provides acceptable protection when a channel is inoperable.

L13 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-1, ACTION 12 for Functional Units 19 (Safety Injection Input from ESF), 20.A (Reactor Trip Breakers, Startup and Power Operation), and 21.A (Automatic Trip Logic, Startup and Power Operation) states, "With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE." ITS LCO 3.3.1, ACTION M for Functions 15 (Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS) and 19 (Automatic Trip Logic); and ACTION N for Function 17 (Reactor Trip Breakers) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours for an inoperable Safety Injection Input from ESF train, Reactor Trip Breaker train, or an Automatic Trip Logic train, plus increasing the allowed time a train can be bypassed for surveillance testing from 2 hours to 4 hours.

The purpose of CTS Table 3.3-1, ACTION 12 is to allow some time to restore the inoperable train before requiring a unit shutdown. ITS LCO 3.3.1 ACTION M allows 24 hours to restore the train to an OPERABLE status and the Required Actions Note allows placing one train in the bypassed condition for up to 4 hours while performing routine surveillance testing provided the other train is OPERABLE. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L14 *(Category 7 – Relaxation of Surveillance Frequency)* The CTS surveillance requirements specified In Table 4.3-1 for Functional Unit 2 (Power Range, Neutron Flux) include a CHANNEL CALIBRATION performed every quarter. The surveillance is modified by Note 6 that excludes the neutron detectors. ITS Function 2.a (Power Range Neutron Flux, High) and Function 2.b (Power Range Neutron Flux, Low) require a CHANNEL CALIBRATION (SR 3.3.1.11) to be

Licensee Response/NRC Response/NRC Question Closure

Id	**89**
NRC Question Number	**KAB005**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:43 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**24**
NRC Question Number	**KAB006**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**106, 137**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 106 and 137 of Enclosure 2, Volume 8, Insert 1 is added to ITS TS 3.3.1A Required Action for Condition Q, which is associated with function 18, "Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms." Insert 1 states, "NOTE The reactor trip breaker train shall not be bypassed while one of the diverse trip features is inoperable except for up to 4 hours for performing maintenance to restore the breaker to OPERABLE status." This note is identical to ACTION 15 in CTS 3.3.1. ACTION 15 applies to functional unit 20.A, "Reactor Trip Breakers, Startup and Power Operation." However, in ITS the reactor trip breakers are split into two functions, function 17, "Reactor Trip Breakers," and function 18, "Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms," as opposed to being one function in CTS. Therefore, there are two conditions in ITS associated with reactor trip breakers and their mechanisms, Condition Q as stated above and Condition N for the reactor trip breakers themselves. Please add insert 1 to Condition N for consistency with CTS or explain why this note should not apply to Condition N.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:34 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**27**
NRC Question Number	**KAB006**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**CTS Table 3.3-1, Functional Unit 20, has two actions associated with inoperable portions of the reactor trip breakers. As discussed in DOC A10, ACTION 15 applies to the condition where one of the diverse trip features (undervoltage or shunt trip attachment) is inoperable. If the diverse trip feature is not restored to operable status within 48 hours, then the reactor trip breaker is declared inoperable and ACTION 12 is applicable. ACTION 12 applies to an inoperable reactor trip breaker. Therefore, there are two different Actions associated with two separate aspects of Functional Unit 20.** **In ITS 3.3.1, the Required Actions of Condition N are modified by a Note allowing one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. This Note reflects the allowance in CTS Table 3.3-1 ACTION 12, with the exception of the change to the length of time the train can be bypassed, as discussed in DOC L12.** **The Note modifying ITS 3.3.1, Required Actions of Condition Q, reflects the allowance to bypass the reactor trip beaker to perform breaker maintenance with an inoperable diverse trip feature, as provided in CTS Table 3.3-1, ACTION 15. Therefore, the Note modifying the ITS 3.3.1 Condition Q Required Actions does not apply to the ITS 3.3.1 Condition N Required Actions.**
Response Date/Time	**5/16/2014 1:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/16/2014 12:38 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**43**
NRC Question Number	**KAB006**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:18 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**25**
NRC Question Number	**KAB007**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**A-16**
JFD Number	
JFD Bases Number	
Page Number (s)	**15, 39**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 15 and 39 of Enclosure 2, Volume 8, the CTS column, "Modes for which surveillance is required," has a reference to A16. A16 discusses the reactor trip breakers and CTS action 15. Please explain why A16 is being referenced or provide the correct reference.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:36 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**23**
NRC Question Number	**KAB007**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CTS markups for A16 to A17.pdf** (38KB)
Attachment 2	
Response Statement	**The discussion of change (DOC) A16 reference on CTS pages 15 and 39 of Enclosure 2, Volume 8, should reference DOC A17. These CTS pages will be revised to correctly refer to DOC A17.** **See Attachment 1 for revised CTS markups.**
Response Date/Time	**5/14/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/14/2014 3:25 PM**
Date Modified	
Modified By	

ITS

Table 3.3.1-1

A01

ITS 3.3.1

M01

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

~~A16~~ A17

ITS		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1	1.	Manual Reactor Trip	N.A.	A18 N.A.	L14 ~~S/U(1)and~~ ~~R~~(9) SR 3.3.1.12	1, 2, and *
2.a 2.b	2.	Power Range, Neutron Flux	SR 3.3.1.1 ~~S~~	SR 3.3.1.2 ~~D~~(2), SR 3.3.1.3 (3) and ~~Q~~(6) SR 3.3.1.11 ~~18 months~~	~~Q~~ SR 3.3.1.7 SR 3.3.1.8, INSERT 2 LA05	1, 2
3.a	3.	Power Range, Neutron Flux, High Positive Rate	N.A.	~~R~~(6) SR 3.3.1.11	~~Q~~ SR 3.3.1.7	1, 2
3.b	4.	Power Range, Neutron Flux, High Negative Rate	N.A.	~~R~~(6) SR 3.3.1.11 M17 ~~184 days thereafter~~	M16 ~~Q~~ SR 3.3.1.7 INSERT 2	1, 2
4	5.	Intermediate Range, Neutron Flux	SR 3.3.1.1 ~~S~~	~~R~~(6) SR 3.3.1.11	S/U(1) SR 3.3.1.8 INSERT 1	1, 2, and *
5	6.	Source Range, Neutron Flux	SR 3.3.1.1 ~~S~~(7)	~~R~~(6) SR 3.3.1.11	~~M~~ and S/U(1) SR 3.3.1.7 SR 3.3.1.8	2, 3, 4, 5, and *
6	7.	Overtemperature Delta T	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
7	8.	Overpower Delta T	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.a	9.	Pressurizer Pressure--Low	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.b	10.	Pressurizer Pressure--High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
9	11.	Pressurizer Water Level—High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
10	12.	Loss of Flow - Single Loop	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1
10	13.	Loss of Flow - Two Loops	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	N.A.	1
13	14.	Steam Generator Water Level--Low-Low				
13.a		A. Steam Generator Water Level--Low-Low (Adverse)	SR 3.3.1.1 ~~S~~	SR 3.3.1.10 ~~R~~	~~Q~~ SR 3.3.1.7	1, 2
13.b		B. Steam Generator Water Level--Low-Low (EAM)	SR 3.3.1.1 ~~S~~	SR 3.3.1.10 ~~R~~	~~Q~~ SR 3.3.1.7	1, 2
13.a 13.b		C. RCS Loop ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a		D. Containment Pressure (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2

M18 Add proposed SR 3.3.1.6 and Note at a Frequency of ~~92 EFPD~~

L15 ~~184 days~~

LA01 In accordance with the Surveillance Frequency Control Program

ITS

Table 3.3.1-1

A01

ITS 3.3.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M01 LA05 ~~A16~~ A17 A18 L14 M16 M17 M18

ITS		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1	1.	Manual Reactor Trip	N.A.	N.A.	~~S/U(1)and R(9)~~ SR 3.3.1.12	1, 2, and *
2.a 2.b	2.	Power Range, Neutron Flux	SR 3.3.1.1 ~~S~~	SR 3.3.1.2 ~~D~~(2), SR 3.3.1.3 (3) and ~~Q~~(6) SR 3.3.1.11 ~~18 months~~	~~Q~~ SR 3.3.1.7 SR 3.3.1.8 INSERT 2	1, 2
3.a	3.	Power Range, Neutron Flux, High Positive Rate	N.A	~~R~~(6) SR 3.3.1.11	SR 3.3.1.7 ~~Q~~	1, 2
3.b	4.	Power Range, Neutron Flux, High Negative Rate	N.A	SR 3.3.1.11 ~~R~~(6) ~~184 days thereafter~~	SR 3.3.1.7 ~~Q~~ INSERT 2	1, 2
4	5.	Intermediate Range, Neutron Flux	SR 3.3.1.1 ~~S~~	~~R~~(6) SR 3.3.1.11	S/U(1) SR 3.3.1.8 INSERT 1	1, 2, and *
5	6.	Source Range, Neutron Flux	SR 3.3.1.1 ~~S~~(7)	~~R~~(6) SR 3.3.1.11	~~M~~ and S/U(1) SR 3.3.1.7 SR 3.3.1.8	2, 3, 4, 5, and *
6	7.	Overtemperature ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	SR 3.3.1.7 ~~Q~~	1, 2
7	8.	Overpower ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.a	9.	Pressurizer Pressure--Low	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
8.b	10.	Pressurizer Pressure--High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
9	11.	Pressurizer Water Level—High	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
10	12.	Loss of Flow - Single Loop	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1
10	13.	Loss of Flow - Two Loops	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	N.A.	1
13	14.	Steam Generator Water Level--Low-Low				
13.a	A.	Steam Generator Water Level- - Low-Low (Adverse)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.b	B.	Steam Generator Water Level- - Low-Low (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a 13.b	C.	RCS Loop ΔT	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2
13.a	D.	Containment Pressure (EAM)	SR 3.3.1.1 ~~S~~	~~R~~ SR 3.3.1.10	~~Q~~ SR 3.3.1.7	1, 2

Add proposed SR 3.3.1.6 and Note at a Frequency of ~~92 EFPD~~

~~184 days~~ L15

In accordance with the Surveillance Frequency Control Program LA01

Enclosure 2, Volume 8, Rev. 0, Page 39 of 1148

Licensee Response/NRC Response/NRC Question Closure

Id	**44**
NRC Question Number	**KAB007**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:19 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**26**
NRC Question Number	**KAB008**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**M-18**
JFD Number	
JFD Bases Number	
Page Number(s)	**73**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 73 of Enclosure 2, Volume 8, M18 provides the discussion of the proposed change that adds surveillance requirement 3.3.1.6 to CTS function 7, "Overtemperature Delta T." ITS SR 3.3.1.6 requires calibration of the excore channels to agree with incore detector measurements 24 hours after thermal power is ≥ 50% rated thermal power and every 92 effective full power days. M16 states, "The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements every 18 months with a Note which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU." Please explain how, "every 18 months with a Note which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU," applies.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:38 PM**
Notification	**Michelle Conner Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**28**
NRC Question Number	**KAB008**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised DOC M18.pdf** (919KB)
Attachment 2	
Response Statement	**In response to RAI KAB008, SQN proposes to revise the discussion of change (DOC) M18. The first paragraph of DOC M18 states, "ITS SR 3.3.1.6 is modified by a Note that states that the Surveillance is not required to be performed until 24 hours [after] THERMAL POWER is ≥ 50% RTP." The reference to the Note in the second paragraph will be revised to be consistent with the first paragraph. Specifically, the phrase, "a Note which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU," will be replaced with, "a Note that states that the Surveillance is not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP."** **See Attachment 1 for draft ITS M18 markup.**
Response Date/Time	**5/16/2014 1:45 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/16/2014 12:44 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

every 184 days instead of only during a startup if not performed in previous 31 days.

M18 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 7 (Overtemperature ΔT) at a Frequency of at least once per 18 months. However, the CTS does not include a requirement to calibrate the excore channels to agree with the incore channels, which is needed to determine the f_1 (delta I) penalty. ITS Table 3.3.1-1 Function 6 (Overtemperature ΔT) requires the performance of ITS SR 3.3.1.6, calibrate excore channels to agree with incore detector measurements, for the Overtemperature ΔT channels. ITS SR 3.3.1.6 requires the calibration of excore channels to agree with incore detector measurements every 92 effective full power days (EFPD). ITS SR 3.3.1.6 is modified by a Note that states that the Surveillance is not required to be performed until 24 hours THERMAL POWER is ≥ 50% RTP. This changes the CTS by adding an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements.

after

that states that the Surveillance is not required to be performed until 24 hours after THERMAL POWER ≥ 50% RTP

The purpose of the excore to incore calibration is to ensure that the excore detectors are accurately measuring power. The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements every 18 months with a Note ~~which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU~~. This change is acceptable because the proposed Surveillance is consistent with current plant practice and ensures the incore to excore detector calibration is performed periodically. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function. This change is designated as more restrictive because a new Surveillance with an explicit Frequency has been added to the Technical Specifications.

M19 CTS Table 4.3-1 Functional Units 18.A and 18.B specify the Surveillance Requirements for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions and do not include a CHANNEL CALIBRATION requirement. ITS Table 3.3.1-1 Functions 14.a and 14.b require a CHANNEL CALIBRATION (ITS SR 3.3.1.10) of these channels every 18 months. This changes the CTS by adding a CHANNEL CALIBRATION requirement for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions every 18 months. See DOC LA01 for discussion of moving Frequencies to the Surveillance Frequency Control Program (SFCP).

This change is acceptable because it ensures the channel output responds within the necessary range and accuracy to known values of the parameter that the channel monitors for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Trip Functions. The CHANNEL CALIBRATION Frequency (18 months) is consistent with the current refueling outage cycle. This change is designated as more restrictive because a new Surveillance Requirement has been added to the Turbine Trip Functions.

M20 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 2 (Power Range, Neutron Flux) by performance of a heat balance ((D(2)) at least once per 24 hours when above 15% RATED THERMAL POWER. ITS Table

Licensee Response/NRC Response/NRC Question Closure

Id	**47**
NRC Question Number	**KAB008**
Select Application	**NRC Response**
Attachment 1	
Attachment 2	
Response Statement	**ITS SR 3.3.1.6 requires calibration of the excore channels to agree with incore detector measurements 24 hours after thermal power is ≥ 50% rated thermal power and *every 92 effective full power days*. M18 states, "The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements *every 18 months*..." Please explain if ITS SR 3.3.1.6 will be performed every 92 effective full power days or 18 months. If the frequency is 18 months please explain how this is more restrictive than the 18 month channel calibration in the CTS.**
Response Date/Time	**5/23/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:33 PM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**136**
NRC Question Number	**KAB008**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised DOC M18 - R2.pdf** (936KB)
Attachment 2	
Response Statement	**This response supplements the first response to RAI KAB008 based on NRC response dated May 23, 2014.** **Discussion of change (DOC) M18 will be revised. Specifically, the reference to the Frequency and the Note in the second paragraph of DOC M18 will be revised to read, "The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements every 92 EFPD with a Note that states that the Surveillance is not required to be performed until 24 hours after THERMAL POWER is ≥ 50% RTP."** **The Frequency for ISTS SR 3.3.1.6 is 92 EFPD. SQN is proposing to retain the Frequency of 92 EFPD, however, the Frequency will be relocated to the Surveillance Frequency Control Program as discussed in justification for deviation (JFD) 6.** **See Attachment 1 for the revised draft DOC M18.**
Response Date/Time	**6/20/2014 5:30 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**6/20/2014 4:27 AM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

every 184 days instead of only during a startup if not performed in previous 31 days.

M18 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 7 (Overtemperature ΔT) at a Frequency of at least once per 18 months. However, the CTS does not include a requirement to calibrate the excore channels to agree with the incore channels, which is needed to determine the f_1 (delta I) penalty. ITS Table 3.3.1-1 Function 6 (Overtemperature ΔT) requires the performance of ITS SR 3.3.1.6, calibrate excore channels to agree with incore detector measurements, for the Overtemperature ΔT channels. ITS SR 3.3.1.6 requires the calibration of excore channels to agree with incore detector measurements every 92 effective full power days (EFPD). ITS SR 3.3.1.6 is modified by a Note that states that the Surveillance is not required to be performed until 24 hours THERMAL POWER is ≥ 50% RTP. This changes the CTS by adding an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements.

after

The purpose of the excore to incore calibration is to ensure that the excore detectors are accurately measuring power. The change adds an explicit Surveillance to calibrate the excore channels to agree with incore detector measurements every ~~18 months with a Note which allows a delay in the requirement that the Surveillance performance be current until core average burnup is ≥ 500 MWD/MTU~~. This change is acceptable because the proposed Surveillance is consistent with current plant practice and ensures the incore to excore detector calibration is performed periodically. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function. This change is designated as more restrictive because a new Surveillance with an explicit Frequency has been added to the Technical Specifications.

92 EFPD with a Note that states that the Surveillance is not required to be performed until 24 hours after THERMAL POWER ≥ 50% RTP

M19 CTS Table 4.3-1 Functional Units 18.A and 18.B specify the Surveillance Requirements for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions and do not include a CHANNEL CALIBRATION requirement. ITS Table 3.3.1-1 Functions 14.a and 14.b require a CHANNEL CALIBRATION (ITS SR 3.3.1.10) of these channels every 18 months. This changes the CTS by adding a CHANNEL CALIBRATION requirement for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Functions every 18 months. See DOC LA01 for discussion of moving Frequencies to the Surveillance Frequency Control Program (SFCP).

This change is acceptable because it ensures the channel output responds within the necessary range and accuracy to known values of the parameter that the channel monitors for the Turbine Trip - Low Fluid Oil Pressure and Turbine Trip - Turbine Stop Valve Closure Trip Functions. The CHANNEL CALIBRATION Frequency (18 months) is consistent with the current refueling outage cycle. This change is designated as more restrictive because a new Surveillance Requirement has been added to the Turbine Trip Functions.

M20 CTS Table 4.3-1 requires a CHANNEL CALIBRATION of Functional Unit 2 (Power Range, Neutron Flux) by performance of a heat balance ((D(2)) at least once per 24 hours when above 15% RATED THERMAL POWER. ITS Table

Licensee Response/NRC Response/NRC Question Closure

Id	**137**
NRC Question Number	**KAB008**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**6/20/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**6/20/2014 7:41 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**27**
NRC Question Number	**KAB009**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	**L-20**
JFD Number	
JFD Bases Number	
Page Number(s)	**96**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 96 of Enclosure 2, Volume 8, L20 provides the discussion for ITS SR 3.3.1.7. ITS SR 3.3.1.7 contains a note that states, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 24 hours after entry into Mode 3." The proposed change has been modified from the 4 hours after entry into MODE 3 allowance in ISTS to 24 hours after entry into MODE 3. The CTS do not allow any delay to perform the test. This is a beyond scope change since it is not in the CTS or the ISTS. Provide the technical evaluation for NRC review or remove the modification.**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:38 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**29**
NRC Question Number	**KAB009**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Revised ITS submittal pages.pdf** (41KB)
Attachment 2	
Response Statement	**In response to KAB009, the Note associated with ITS SR 3.3.1.7 will be modified to align with ISTS. Specifically, ITS SR 3.3.1.7 Note, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 24 hours after entry into MODE 3," will be revised to state, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3." Additionally, discussion of change L20 associated with the ITS SR 3.3.1.7 Note will be revised.** **A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS conversion submittal.**
Response Date/Time	**5/16/2014 2:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/16/2014 12:50 PM**
Date Modified	
Modified By	

SURVEILLANCE REQUIREMENTS (continued)

CTS		SURVEILLANCE	FREQUENCY	
4.3.1.1.2 Function 22.B Table 4.3-1 Function 21 including Note (5)	SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	6 6
DOC M18	SR 3.3.1.6	-----------------------------NOTE------------------------------ Not required to be performed until ~~[~~24~~]~~ hours after THERMAL POWER is ≥ 50% RTP. --- Calibrate excore channels to agree with incore detector measurements.	~~[[92] EFPD~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 6 6
DOC L20 Table 4.3-1 Functions 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, and 14,	SR 3.3.1.7	-----------------------------NOTE------------------------------ Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. --- stet ~~24~~ Perform COT.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	~~2~~ 6 6

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.3.1.1.2 Function 22.B Table 4.3-1 Function 21 including Note (5)	SR 3.3.1.5	Perform ACTUATION LOGIC TEST.	~~[92 days on a STAGGERED TEST BASIS~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	6 6
DOC M18	SR 3.3.1.6	-----------------------------NOTE----------------------------- Not required to be performed until ~~[~~24~~]~~ hours after THERMAL POWER is ≥ 50% RTP. --- Calibrate excore channels to agree with incore detector measurements.	~~[[92] EFPD~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 6 6
DOC L20 Table 4.3-1 Functions 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, and 14,	SR 3.3.1.7	-----------------------------NOTE----------------------------- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. --- stet ~~24~~ Perform COT.	~~[184 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	~~2~~ 6 6

DISCUSSION OF CHANGES
ITS 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION

and automatic shunt trip circuits from the Automatic Trip Logic ACTUATION LOGIC TEST.

The purpose of this part of CTS Table 4.3-1, Note (5) is to ensure each diverse trip mechanism is tested to prevent a reduction in the reliability of the reactor trip system. This change is acceptable because the deleted Surveillance Requirement is not necessary to verify that the equipment used to meet the LCO can perform its required functions. Thus, appropriate equipment continues to be tested in a manner and at a frequency necessary to give confidence that the equipment can perform its assumed safety function. TVA added this requirement for independent testing of the reactor trip breaker undervoltage and shunt trip circuits in response to NRC Generic Letter 85-09, "Technical Specifications for Generic Letter 83-28, Item 4.3," (GL 85-09). This change is acceptable because it is consistent with GL 85-09 and the reactor trip breaker test will continue to include separate verification of the undervoltage and shunt trip mechanisms under ITS SR 3.3.1.4. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L20 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1, in part, requires a FUNCTIONAL TEST for Functional Unit 6 (Source Range, Neutron Flux) in MODES 2, 3, 4, 5, and with the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. When in the required MODES, the FUNCTIONAL TEST is required to be performed on a monthly basis (M) and prior to startup (S/U) if not performed in the previous 31 days (Note (1)). ITS Table 3.3.1-1 requires a CHANNEL OPERATIONAL TEST (COT) for Function 5 (Source Range Neutron Flux) in MODE 2 below the P-6 interlocks; and MODES 3, 4, and 5 with the Rod Control System capable of rod withdrawal or one or more rods not fully inserted. The COT required to be performed in MODES 3, 4, or 5 is ITS SR 3.3.1.7 (MODE 2 is discussed in DOC M16). ITS SR 3.3.1.7 is modified by a note stating, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until ~~2~~4 hours after entry into MODE 3." This changes the CTS by allowing for a delay in performance of the surveillance.

The purpose of the CTS FUNCTIONAL TEST for the Source Range Neutron Flux Function is to ensure the entire channel will perform the intended Function. This change is acceptable because the delay in surveillance performance is similar to that allowed under SR 3.0.3 when it is determined a surveillance has been missed. The function of the Source Range Neutron flux trip is to backup the Power Range Neutron Flux-Low Setpoint Reactor Trip, providing protection against an uncontrolled rod cluster control assembly bank withdrawal from a subcritical condition. The addition of the Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the reactor trip breakers are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the reactor trip breakers closed for greater than ~~2~~4 hours this Surveillance must be performed prior to ~~2~~4 hours after entry into MODE 3. This change is designated as less restrictive because a Surveillance will be performed less frequently under the ITS than under the CTS.

Enclosure 2, Volume 8, Rev. 0, Page 96 of 1148

Licensee Response/NRC Response/NRC Question Closure

Id	**45**
NRC Question Number	**KAB009**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:19 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**28**
NRC Question Number	**KAB010**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.1**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**48**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 48 of Enclosure 2, Volume 8, TS Table 2.2-1 Note 1 states, "$K_2 \leq$ 0.011." However, CTS and ITS TS Table 2.2-1 Note 1 states, "$K_2 \geq 0.011$." Please explain this discrepancy**
Attach File 1	
Attach File 2	
Issue Date	**5/1/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/1/2014 2:39 PM**
Notification	**Michelle Conner** **Khadijah Hemphill**

Licensee Response/NRC Response/NRC Question Closure

Id	**24**
NRC Question Number	**KAB010**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Revised Unit 2 CTS page.pdf** (37KB)
Attachment 2	
Response Statement	**The correct inequality sign for Unit 2 CTS Table 2.2-1, Note 1 is ≥ (greater than or equal to). The Note should state, "$K_2 \geq 0.011$." The incorrect inequality sign is a typographical error that was introduced when the word files were converted from Word95 to the present version. The current plant operating technical specifications, as well as, the retrievable version of technical specifications from the NRC website, have the correct inequality sign. The CTS page will be revised to reflect the correct inequality sign.** **See Attachment 1 for the revised CTS page.**
Response Date/Time	**5/14/2014 4:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/14/2014 3:30 PM**
Date Modified	
Modified By	

ITS

A01

ITS 3.3.1

Table 3.3.1-1

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

Note 1

NOTE 1:

$$\text{Overtemperature } \Delta T \left(\frac{1 + \tau_4 S}{1 + \tau_5 S}\right) \leq \Delta T_0 \left\{K_1 - K_2 \left(\frac{1 + \tau_1 S}{1 + \tau_2 S}\right)[T - T'] + K_3 (P - P') - f_1 (\Delta I)\right\}$$

Where:

$\cancel{\frac{1+\tau_4 S}{1+\tau_5 S}}$	=	~~Lead-lag compensator on measured ΔT~~
$\cancel{\tau_4, \tau_5}$	=	~~Time constants utilized in the lead-lag controller for ΔT~~, $\tau_4 \geq$ ~~5~~ secs, $\tau_5 \leq$ ~~3~~ sec.
ΔT_0	=	Indicated ΔT at RATED THERMAL POWER
K_1	≤	~~1.15~~
K_2	$\boxed{\geq}$ ~~≤~~	~~0.011~~
$\cancel{\frac{1+\tau_1 S}{1+\tau_2 S}}$	=	~~The function generated by the lead-lag controller for T_{avg} dynamic compensation~~
$\cancel{\tau_1, \& \tau_2}$	=	~~Time constants utilized in the lead-lag controller for T_{avg}~~, $\tau_1 \geq$ ~~33~~ secs., $\tau_2 \leq$ ~~4~~ secs.
T	=	Average temperature °F
T'	≤	~~578.2~~°F (T_{avg} at RATED THERMAL POWER)
K_3	=	~~0.00055~~
P	=	Pressurizer pressure, psig
P'	=	~~2235~~ psig (Nominal RCS operating pressure)

LA08

LA09

*

LA08

*

LA09

Licensee Response/NRC Response/NRC Question Closure

Id	**46**
NRC Question Number	**KAB010**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/23/2014 2:20 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**34**
NRC Question Number	**KAB011**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number (s)	**375**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 375 of Enclosure 2, Volume 8, Table 4.3-1, Reactor Trip System Instrumentation Surveillance Requirements," column, "Modes for which surveillance is required," has a reference to A07. A07 discusses the ESFAS Response time of each ESFAS function and the staggered test basis. Please explain why A07 is being referenced to considering that or provide the correct reference.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:19 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**37**
NRC Question Number	**KAB011**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 CTS U2 A04 reference.pdf** (17KB)
Attachment 2	
Response Statement	**In response to KAB011, the reference to A07 on page 375 of Enclosure 2, Volume 8, Table 4.3-1, "REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS," column, "MODES FOR WHICH SURVEILLANCE IS REQUIRED," will be revised. Specifically, Reference A07 will be changed to A04.** **See Attachment 1 for the draft revised ITS submittal page.**
Response Date/Time	**5/23/2014 1:35 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/23/2014 12:36 PM**
Date Modified	
Modified By	

ITS

A01

ITS 3.3.2

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

M02

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
15. Deleted				
16. Undervoltage - Reactor Coolant Pumps	N.A.	R	Q	1
17. Underfrequency - Reactor Coolant Pumps	N.A.	R	Q	1
18. Turbine Trip				
A. Low Fluid Oil Pressure	N.A.	N.A.	(1) (12)	1**
B. Turbine Stop Valve Closure	N.A.	N.A.	(1) (12)	1**
19. Safety Injection Input from ESF	N.A.	N.A.	R	1, 2
20. Reactor Trip Breaker	N.A.	N.A.	M(5) and S/U(1)	1, 2, and *
21. Automatic Trip Logic	N.A.	N.A.	M(5)	1, 2, and *
22. Reactor Trip System Interlocks				
A. Intermediate Range Neutron Flux, P-6	N.A.	R	N.A.	2, and *
B. Power Range Neutron Flux, P-7	N.A.	N.A.	N.A.	1
C. Power Range Neutron Flux, P-8	N.A.	R	N.A.	1
D. Power Range Neutron Flux, P-10	N.A.	R	N.A.	1, 2
E. Turbine Impulse Chamber Pressure, P-13	N.A.	R	N.A.	1
F. Power Range Neutron Flux, P-9	N.A.	R	N.A.	1
G. Reactor Trip, P-4	N.A.	N.A.	~~R~~ SR 3.3.2.10 Once per reactor trip breaker cycle	1, 2, and *
23. Reactor Trip Bypass Breaker	N.A.	N.A.	M(10)R(11)	1, 2, and *

See ITS 3.3.1

Table 3.3.2-1 8.a

A04

M03

~~A07~~

See ITS 3.3.1

Licensee Response/NRC Response/NRC Question Closure

Id	**50**
NRC Question Number	**KAB011**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/27/2014 2:15 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**35**
NRC Question Number	**KAB012**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**A-7**
JFD Number	
JFD Bases Number	
Page Number (s)	**415**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 415 of Enclosure 2, Volume 8, A07 provides the discussion for CTS 4.3.2.1.3 ESFAS Response Time of each ESFAS function. However, in the discussion it refers to reactor trip function instead of the ESFAS function. Please explain this discrepancy.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:21 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**38**
NRC Question Number	**KAB012**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised 3.3.2 DOC A07.pdf** (11KB)
Attachment 2	
Response Statement	**In response to KAB012, discussion of change (DOC) A07 will be revised. Specifically, the sentence, “The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-3.” will be revised to, “The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.”** **See Attachment 1 for the draft revised DOC A07.**
Response Date/Time	**5/23/2014 2:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/23/2014 1:25 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

Water Level -- High-High, Main Steam Generator Water Level -- Low-Low, Station Blackout, Trip of Main Feedwater Pumps, Loss of Power, and RWST Level-Low Coincident with Containment Sump Level - High and Safety Injection. ITS Table 3.3.2-1 requires the performance of SR 3.3.2.9, "Verify ESFAS RESPONSE TIMES are within limits," for Functions 1.c (Safety Injection - Containment Pressure - High), 1.d (Safety Injection - Pressurizer Pressure – Low), 1.e (Safety Injection - Steam Line Pressure Low), 2.c (Containment Spray – Containment Pressure High-High), 3.b.(3) (Containment Isolation - Containment Pressure High-High), 4.c (Steam Line Isolation - Containment Pressure High-High), 4.d.(1) (Steam Line Isolation – Steam Line Pressure Low), 4.d.(2) (Steam Line Isolation – Negative Rate - High), 5.b (Turbine Trip and Feedwater Isolation – SG Water Level High-High (P-14)), 6.b.(1) (Auxiliary Feedwater - SG Water Level Low Low – Adverse), 6.b.(2) (Auxiliary Feedwater - SG Water Level Low Low – EAM), 6.d.(1) (Auxiliary Feedwater, Loss of Power – Voltage Sensors), 6.d.(2) (Auxiliary Feedwater, Loss of Power – Load Shed Timer), 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps), and 7.b (Automatic Switchover to Containment Sump, RWST Level - Low Coincident with Safety Injection and Coincident with Containment Sump Level – High). As with the CTS, "Manual" and "Automatic Actuation Logic and Actuation Relays" Functions are excluded from RESPONSE TIME TESTING. This changes the CTS by specifically stating which Functions the ESFAS RESPONSE TIME testing is required.

The purpose of CTS 4.3.2.1.3 is to ensure that the actuation response times are less than or equal to the maximum values assumed in the accident analysis. UFSAR Table 7.3.1-4 specifies response times for those ESFAS Functions assumed in the SQN safety analyses. This change is acceptable because ITS 3.3.2, Table 3.3.2-1 continues to require ESFAS RESPONSE TIME testing (ITS SR 3.3.2.9) for those Functions listed in UFSAR Table 7.3.1-4. This change is designated as administrative because it does not result in technical changes to the CTS.

A07 CTS 4.3.2.1.3 states, in part, that the ESFAS RESPONSE TIME of each ESFAS function shall be demonstrated to be within its limit at least once per 18 months. The requirement specifies that each test shall include at least one logic train such that both logic trains are tested at least once per 36 months, and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific ~~reactor trip~~ ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3 ITS SR 3.3.2.9 requires the verification of ESFAS RESPONSE TIMES every 18 months "on a STAGGERED TEST BASIS." The ITS definition of STAGGERED TEST BASIS is consistent with the CTS testing Frequency. This changes the CTS by utilizing the ITS definition of STAGGERED TEST BASIS.

This change is acceptable because the requirements for RESPONSE TIME testing for the ESFAS channels remain unchanged. The ITS definition of STAGGERED TEST BASIS and its application in this requirement do not change the current testing frequency requirements. This change is designated as administrative because it does not result in technical changes to the CTS.

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Licensee Response/NRC Response/NRC Question Closure

Id	**51**
NRC Question Number	**KAB012**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/27/2014 2:16 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**36**
NRC Question Number	**KAB013**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**L-2**
JFD Number	
JFD Bases Number	
Page Number(s)	**435**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 435 of Enclosure 2, Volume 8, L02 provides the discussion of CTS surveillance 4.3.2.1.2 and CTS Table 4.3-2 Note 2. CTS 4.3.2.1.2 and CTS Table 4.3-2 Note 2, requires the logic for the interlocks be demonstrated operable during the automatic actuation logic test such that the total logic function is demonstrated operable at least once per 18 months during channel calibration for each channel affected by the interlock operation. ITS 3.3.2 requires a channel calibration every 18 months and an actuation logic test every 92 days on a staggered test basis. ITS is performing the channel calibration at a frequency equivalent to the CTS and the actuation logic is being tested more frequently than required by the CTS. However, L02 states that this is a less restrictive change. Please explain in further detail why this is considered a less restrictive change.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:22 AM**
Notification	**Scott Bowman Michelle Conner Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**208**
NRC Question Number	**KAB013**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 KAB013.pdf** (54KB)
Attachment 2	
Response Statement	**In response to KAB013, discussion of change (DOC) L02, on page 435 of Enclosure 2, Volume 8, will be deleted. DOC L02 discusses a less restrictive change associated with CTS 4.3.2.1.2 and CTS Table 4.3-2, Table Notation, Note (2). CTS 4.3.2.1.2 requires, in part, the total interlock function be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation. CTS Table 4.3-2, Table Notation, Note (2) requires the total interlock function be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation. CTS 4.3.2.1.2 (pages 337 and 377) and CTS Table 4.3-2, Table Notation, Note (2) markups (pages 371 and 411) will be revised to reflect that this testing requirement will be retained as ITS SR 3.3.2.8.** **See Attachment 1 for the draft revised CTS markups and deletion of DOC L02.**
Response Date/Time	**7/22/2014 11:50 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**7/22/2014 10:51 AM**
Date Modified	
Modified By	

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.2 Table 3.3.2-1 Footnotes (b) and (c)

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

Applicability

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Add proposed ACTIONS Note A05

Table 3.3.2-1 Footnote (b) ACTION A Table 3.3.2-1 Footnote (c)

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

ACTION A

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

Surveillance Requirements Table Note

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2. M02

SR 3.3.2.2 for Functions 1.b and 4.b

SR 3.3.2.8

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. ~~The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~ STET

~~L02~~ A06

SR 3.3.2.9

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.~~

~~18 months on a STAGGERED TEST BASIS~~ A07

In accordance with the Surveillance Frequency Control Program LA02

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TABLE 4 .3-2 (Continued)

TABLE NOTATION

In accordance with the Surveillance Frequency Control Program LA02

~~92 days on a STAGGERED TEST BASIS~~ L15

SR 3.3.2.2 (1) Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.

SR 3.3.2.8 ~~(2)~~ ~~The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~ ~~L01~~

STET

Add proposed SR 3.3.2.6 Note

Add proposed SR 3.3.2.7 Note A18

Add proposed SR 3.3.2.10 Note

Add proposed SR 3.3.2.8 Note A19

Add proposed SR 3.3.2.9 Note A20

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ITS A01 ITS 3.3.2

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

LCO 3.3.2
Table 3.3.2-1 Footnotes (b) and (c)

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

Add proposed ACTIONS Note A05

Table 3.3.2-1 Footnote (b)
ACTION A
Table 3.3.2-1 Footnote (c)

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

ACTION A

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

Surveillance Requirements Table Note

4.3.2.1.1 Each ESFAS instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2. M02

SR 3.3.2.2 for Functions 1.b and 4.b
SR 3.3.2.8

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. ~~The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~ STET

~~L02~~ A06

SR 3.3.2.9

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit ~~at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.~~

~~18 months on a staggered test basis~~ A07

In accordance with the Surveillance Frequency Control Program LA02

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ITS

A01

ITS 3.3.2

TABLE 4.3-2 (Continued)
TABLE NOTATION

In accordance with the Surveillance Frequency Control Program

LA02

~~92 days on a STAGGERED TEST BASIS~~

L15

SR 3.3.2.2 (1) Each train or logic channel shall be tested at least every ~~62 days on a STAGGERED TEST BASIS~~.

SR 3.3.2.8 ~~(2) The total interlock function shall be demonstrated OPERABLE during CHANNEL CALIBRATION testing of each channel affected by interlock operation.~~

~~L01~~

STET

Add proposed SR 3.3.2.6 Note

Add proposed SR 3.3.2.7 Note

Add proposed SR 3.3.2.10 Note

A18

Add proposed SR 3.3.2.8 Note

A19

Add proposed SR 3.3.2.9 Note

A20

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DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

does not contain this information. This changes the CTS by moving the details of which steam generator water level instrument range the limit is associated with to the TS 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 Nominal Trip Setpoint and Allowable Value for the Steam Generator Water Level—High-High Functional Unit. 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 Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS Table 3.3-1 Functional Unit 22.G (Reactor Trip Interlock, Reactor Trip P-4) and associated ACTION 14 requires the plant to be placed in at least HOT STANDBY within 6 hours when the number of P-4 channels OPERABLE is one less than required by the Minimum Channels OPERABLE column (one of two channels inoperable). ITS Table 3.3.2-1 Function 8.a (ESFAS Interlock Reactor Trip P-4) and associated ACTION G allow 48 hours to restore the inoperable channel or train to OPERABLE status before requiring the plant be in MODE 3 (Similar conditions to CTS HOT STANDBY) within 6 hours (54 hour Completion Time). This changes the CTS by increasing the Completion Time for placing the plant in MODE 3 from 6 hours to 54 hours when one channel of P-4 is inoperable.

The purpose of the P-4 interlock is to provide the appropriate interlock when the Reactor Trip Breaker and its corresponding bypass breaker are open. The function actuates turbine trip, provides Feedwater Isolation Signal on Tavg below setpoint, prevents opening of main feedwater valves which were closed by safety injection or high steam generator water level, and allows manual block of the automatic re-actuation of safety injection. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the allowed Completion Time. This change is designated as less restrictive because additional time is allowed to restore instrument channels to OPERABLE status before placing the plant in MODE 3 than was allowed in the CTS.

L02 ~~*(Category 5 - Deletion of Surveillance Requirement)* CTS Surveillance 4.3.2.1.2 specifies, in part, and CTS Table 4.3-2 Note (2) specifies that the total interlock function shall be demonstrated OPERABLE at least once per 18 months during~~

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

~~CHANNEL CALIBRATION testing of each channel affected by interlock operation. The corresponding ITS Surveillances require an Actuation Logic Test (SR 3.3.2.2) of each Function in Table 3.3.2-1. The ACTUATION LOGIC TEST includes verification that the interlocks do not prevent the Functions from operating properly as required. This changes the CTS by eliminating the Surveillance Requirement to verify the total interlock function during the CHANNEL CALIBRATION.~~

~~The interlock functions are part of the solid state protection system (SSPS) logic circuits. Unlike the affected CTS Surveillance, the ITS addresses the testing of logic circuits separately from the CHANNEL CALIBRATION requirements. The ITS CHANNEL CALIBRATION verifies the performance of each channel up to the logic circuits (where channels are combined and lose separate identities). The testing of each channel is governed by the CHANNEL CALIBRATION test definition that ensures the complete channel is verified. The ITS ACTUATION LOGIC TEST verifies all combinations of logic inputs (channels) required for logic circuit OPERABILITY including all required interlocks. As the interlock functions are combinations of channel inputs (e.g., 2/3, 2/4 etc.) in the logic circuitry, the interlock operation is verified during the ACTUATION LOGIC TEST. The interlock logic testing is governed by the ITS ACTUATION LOGIC TEST definition that assures the "input combinations in conjunction with each possible interlock logic state required for OPERABILITY of a logic circuit" are tested. The logic and interlock testing is accomplished by the built in solid state protection system logic tester which also assures all required input combinations and interlocks are fully tested. The proposed change is acceptable because, the required ITS CHANNEL CALIBRATION and more frequent ACTUATION LOGIC TEST (every 92 days on a STAGGERED TEST BASIS) ensure the total interlock function continues to be verified at least once per 18 months (i.e., the same as the CTS surveillance requirement). The ITS defined test terms provide additional assurance that individual channels and all required interlock functions are fully tested. In addition, by separating the logic testing from the CHANNEL CALIBRATION requirements, the ITS presentation of the Surveillance Requirements associated with this instrumentation improve clarity and provide more technically accurate test requirements consistent with industry standards, and the SSPS design including the built in logic test capability. Therefore, the proposed change continues to provide adequate assurance of interlock channel and logic OPERABILITY and does not adversely affect the safe operation of the plant. The proposed change is designated as less restrictive because less stringent requirements will be applied in the ITS than in the CTS.~~

L03 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3, ACTION 15 for Functional Units 1.b (Safety Injection, Automatic Actuation Logic), 2.b (Containment Spray, Automatic Actuation Logic), 3.b.2) (Containment Isolation Phase B, Automatic Actuation Logic), and 9.b (Automatic Switchover to Containment Sump, Automatic Actuation Logic) states, "With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is

Licensee Response/NRC Response/NRC Question Closure

Id	**209**
NRC Question Number	**KAB013**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**7/23/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**7/23/2014 11:45 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**37**
NRC Question Number	**KAB014**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**L-3**
JFD Number	
JFD Bases Number	
Page Number (s)	**436**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 436 of Enclosure 2, Volume 8, L03 provides the discussion of CTS Table 3.3-3 Action 15 and how it is represented in ITS. L03 refers to ITS LCO 3.3.1 while discussing ESFAS functions. Please correct the reference to ITS LCO 3.3.1 or explain why it is the correct reference.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:23 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**40**
NRC Question Number	**KAB014**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised 3.3.2 DOC L03.pdf** (15KB)
Attachment 2	
Response Statement	**In response to KAB 014, the reference to ITS LCO 3.3.1 in discussion of change (DOC) L03 will be revised. Specifically, the reference to ITS LCO 3.3.1 will be changed to ITS LCO 3.3.2.** **See Attachment 1 for a draft revised DOC L07.**
Response Date/Time	**5/23/2014 2:55 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/23/2014 1:51 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

CHANNEL CALIBRATION testing of each channel affected by interlock operation. The corresponding ITS Surveillances require an Actuation Logic Test (SR 3.3.2.2) of each Function in Table 3.3.2-1. The ACTUATION LOGIC TEST includes verification that the interlocks do not prevent the Functions from operating properly as required. This changes the CTS by eliminating the Surveillance Requirement to verify the total interlock function during the CHANNEL CALIBRATION.

The interlock functions are part of the solid state protection system (SSPS) logic circuits. Unlike the affected CTS Surveillance, the ITS addresses the testing of logic circuits separately from the CHANNEL CALIBRATION requirements. The ITS CHANNEL CALIBRATION verifies the performance of each channel up to the logic circuits (where channels are combined and lose separate identities). The testing of each channel is governed by the CHANNEL CALIBRATION test definition that ensures the complete channel is verified. The ITS ACTUATION LOGIC TEST verifies all combinations of logic inputs (channels) required for logic circuit OPERABILITY including all required interlocks. As the interlock functions are combinations of channel inputs (e.g., 2/3, 2/4 etc.) in the logic circuitry, the interlock operation is verified during the ACTUATION LOGIC TEST. The interlock logic testing is governed by the ITS ACTUATION LOGIC TEST definition that assures the "input combinations in conjunction with each possible interlock logic state required for OPERABILITY of a logic circuit" are tested. The logic and interlock testing is accomplished by the built in solid state protection system logic tester which also assures all required input combinations and interlocks are fully tested. The proposed change is acceptable because, the required ITS CHANNEL CALIBRATION and more frequent ACTUATION LOGIC TEST (every 92 days on a STAGGERED TEST BASIS) ensure the total interlock function continues to be verified at least once per 18 months (i.e., the same as the CTS surveillance requirement). The ITS defined test terms provide additional assurance that individual channels and all required interlock functions are fully tested. In addition, by separating the logic testing from the CHANNEL CALIBRATION requirements, the ITS presentation of the Surveillance Requirements associated with this instrumentation improve clarity and provide more technically accurate test requirements consistent with industry standards, and the SSPS design including the built in logic test capability. Therefore, the proposed change continues to provide adequate assurance of interlock channel and logic OPERABILITY and does not adversely affect the safe operation of the plant. The proposed change is designated as less restrictive because less stringent requirements will be applied in the ITS than in the CTS.

L03 *(Category 9 – Allowed Outage Time, Surveillance Frequency, and Bypass Time Extensions Based on Generic Topical Reports)* CTS Table 3.3-3, ACTION 15 for Functional Units 1.b (Safety Injection, Automatic Actuation Logic), 2.b (Containment Spray, Automatic Actuation Logic), 3.b.2) (Containment Isolation Phase B, Automatic Actuation Logic), and 9.b (Automatic Switchover to Containment Sump, Automatic Actuation Logic) states, "With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

OPERABLE." ITS Table 3.3.2-1 designates Condition C as the referenced Condition for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays while designating Condition S as the referenced Condition for Function 7.a (Automatic Switchover to Containment Sump, Automatic Actuation Logic and Actuation Relays). ITS LCO 3.3.~~1~~, 2 ACTION C for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and MODE 5 within 60 hours, and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." ITS 3.3.2 Required ACTION S retains the CTS requirements of CTS Table 3.3-3 ACTION 15. This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours, increasing the allowed time to enter MODE 3 from 12 hours to 30 hours, and increases the allowance for entering MODE 5 from 42 hours (12 + 30) to 60 hours for inoperable Safety Injection, Containment Spray, or Containment Isolation Phase B Automatic Actuation Logic and Actuation Relays.

The purpose of CTS Table 3.3-3, ACTION 15 is to allow some time to restore the inoperable train before requiring a unit shutdown. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L04 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3, Functional Units 4 (Steam Line Isolation), 4.a. (Manual), 4.b. (Automatic Actuation Logic), 4.c. (Containment Pressure – High-High), and 4.d. (Steam Line Pressure – Low), are required to be OPERABLE in MODES 1, 2, and 3, while CTS Functional Unit 4.e. (Negative Steam Line Pressure Rate – High) is required to be OPERABLE in MODE 3. Note that CTS Table 3.3-3, Functional Units 4.d and 4.e have further limitations on OPERABILITY as delimitated in Note # and ##, respectively, that are not changing. ITS Table 3.3.2-1, Function 4. (Steam Line Isolation), 4.a (Manual Initiation), 4.b (Automatic Actuation Logic and Actuation Relays), 4.c (Containment Pressure High-High), 4.d.(1) (Steam Line Pressure Low), and 4.d.(2) (Steam Line Pressure Negative Rate – High) include a Footnote for MODES 2 and 3, Footnote (j). Footnote (j) states, "Except when all MSIVs are closed." This changes the CTS by making the Specification for these Functions not applicable in MODES 2 and 3 when all MSIVs are closed.

Licensee Response/NRC Response/NRC Question Closure

Id	**52**
NRC Question Number	**KAB014**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/27/2014 2:16 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**38**
NRC Question Number	**KAB015**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**M-4**
JFD Number	
JFD Bases Number	
Page Number(s)	**426, 427**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 426 and 427 of Enclosure 2, Volume 8, M04 and M05 provides the discussion of adding a surveillance requirement for master and slave relay testing. This discussion states that the slave relay testing SR 3.3.2.5 has a frequency of 18 months. However, ISTS and ITS slave relay testing has a frequency of 92 days. In addition, M04 states, "The Frequency proposed for testing of the slave relays is consistent with the current Frequency for testing if the slave relays." Please explain which frequency is proposed. If Sequoyah is proposing to adopt the ISTS frequency, then please adjust the sentence above to be accurate and update the frequency in M04 and M05. If Sequoyah is proposing to adopt a frequency of 18 months, which is a beyond scope change then please provide the technical evaluation for NRC review.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:25 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**241**
NRC Question Number	**KAB015**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 for KAB015.pdf** (37KB)
Attachment 2	
Response Statement	**SQN proposes to add ITS 3.3.2, Surveillance Requirement (SR) 3.3.2.5, slave relay testing requirements, forFunctional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.a, 6.a, and 7.a at a frequency of every 18 months. This change is annotated on CTS pages 366 and 406 of Enclosure 2, Volume 8 and justified by ITS 3.3.2 discussion of change (DOC) M04 on page 426. ITS 3.3.2, DOC M04, states that the proposed surveillance frequency for slave relay testing, 18 months, is consistent with SQN's current testing practices. SQN's current testing practice, although not required by CTS, ensures the slave relays are tested each refueling outage (18 months).**

Additionally, Westinghouse performed a reliability assessment of Westinghouse Type AR relays used as SSPS slave relays. The objective of WCAP-13877, "Reliability Assessment of Westinghouse Type AR Relays Used as SSPS Slave Relays WOG Program MUHP-7040," was to establish the basis for determining the reliability of the Westinghouse type AR relay. The evaluation was intended to aid in the determination of maintenance and surveillance intervals consistent with reliability goals. A particular objective was to demonstrate that a refueling-based surveillance interval (18 months to 24 months) would not adversely affect the reliability of Solid State Protection System (SSPS) slave relays used in Engineered Safety Feature Actuation System functions. The WCAP used SQN slave relay failure history, in addition to failure history from other utilities, to conclude that the assumed initial quarterly test interval (92 days) supported by WCAP-10271-P-A, Supplement 2, Revision 1 was overly conservative. WCAP-13877 concluded that slave relay testing could be extended to a refueling basis without impact or consequence to relay reliability.

Therefore, based on the conclusion of WCAP-13877, that slave relay testing could be extended to a refueling basis without impact to relay reliability, and SQN's current slave relay testing frequency of 18 months, SQN proposes to adopt ITS SR 3.3.2.5 with an 18 month Frequency.

During review for the response to KAB015, the following issue was identified. The CTS markups for SQN, Units 1 and 2, on pages 366 and 406, contain an insert associated with DOC M04 that should reference Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.<u>a</u>, 6.<u>a</u>, and 7.a vice Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.<u>b</u>, 6.<u>b</u>, and 7.a. The CTS markups will be

revised.

See Attachment 1 for the draft revised CTS markups associated with the DOC M04 insert.

Response Date/Time	**8/5/2014 9:20 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**8/5/2014 8:20 AM**
Date Modified	
Modified By	

ITS

Table 3.3.2-1

A01

ITS 3.3.2

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

M02

	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES IN WHICH SURVEILLANCE REQUIRED~~
	1. SAFETY INJECTION ~~AND FEEDWATER ISOLATION~~				
1.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
1.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
1.c	c. Containment Pressure-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
1.d	d. Pressurizer Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	e. Deleted				
1.e	f. Steam Line Pressure—Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~184 days~~	~~1, 2, 3~~
	2. CONTAINMENT SPRAY				
2.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
2.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
2.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~184 days~~	~~1, 2, 3~~

A08

A04

L14

~~92 days on a STAGGERED TEST BASES~~ L15

In accordance with the Surveillance Frequency Control Program LA02

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.3 at a frequency of ~~92 days on a STAGGERED TEST BASES~~. M04

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.5 at a frequency of ~~every 18 months~~. M04

a

May 16, 1990
Amendment Nos. 47, 141

ITS

A01

ITS 3.3.2

Table 3.3.2-1

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

M02

A04

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	~~MODES FOR WHICH SURVEILLANCE IS REQUIRED~~
	1. SAFETY INJECTION ~~AND FEEDWATER ISOLATION~~ (A08)				
1.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
1.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
1.c	c. Containment Pressure-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
1.d	d. Pressurizer Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	e. Deleted				
1.e	f. Steam Line Pressure--Low	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4	~~1, 2, 3~~
	2. CONTAINMENT SPRAY			~~184 days~~ (L14)	
2.a	a. Manual Initiation	N.A.	N.A.	~~R~~ SR 3.3.2.7	~~1, 2, 3, 4~~
2.b	b. Automatic Actuation Logic	N.A.	N.A.	~~M(1)~~ SR 3.3.2.2	~~1, 2, 3, 4~~
2.c	c. Containment Pressure--High-High	~~S~~ SR 3.3.2.1	~~R~~ SR 3.3.2.8	~~Q~~ SR 3.3.2.4 ~~184 days~~	~~1, 2, 3~~

~~92 days on a staggered test bases~~ L15

In accordance with the Surveillance Frequency Control Program LA02

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.b, 6.b, and 7.a add proposed SR 3.3.2.3 at a frequency of ~~92 days on a STAGGERED TEST BASES~~. M04

For Functional Units 1.b, 2.b, 3.a.(2), 3.b.(2), 4.b, 5.~~b~~, 6.~~b~~, and 7.a add proposed SR 3.3.2.5 at a frequency of ~~every 18 months~~. M04

a

Licensee Response/NRC Response/NRC Question Closure

Id	**309**
NRC Question Number	**KAB015**
Select Application	**NRC Response**
Attachment 1	
Attachment 2	
Response Statement	**Did TVA get approval for the existing 18 month surveillance interval by submitting a LAR that was approved by NRC staff. If so, please provide the information of submittal of the LAR and NRC staff safety evaluation for our confirmation.** **If not then provide the following information as requested in the safety evaluation issued by NRC staff when approving Westinghouse WCAP-13877:** **a. Confirm the applicability of WCAP-13877 (Rev. 1 and Rev. 2) analysis for Sequoyah plants.** **b. Ensure that contact loading analysis for Type AR relays has been performed to determine the acceptability of this analysis.** **c. Determine that the qualified life for the Type AR relays based on plant specific environmental conditions.** **d. Establish a program to evaluate the adequacy of the proposed test interval if two or more AR relays fail in a 12-month period.**
Response Date/Time	**9/3/2014 6:00 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**9/3/2014 7:01 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**356**
NRC Question Number	**KAB015**
Select Application	**Licensee Response**
Attachment 1	
Attachment 2	
Response Statement	**SQN's current technical specifications (CTS) do not contain a Surveillance Requirement to specifically test slave relays. SQN is proposing to add ISTS 3.3.2.6 (ITS SR 3.3.2.5), SLAVE RELAY TEST, as part of the ITS conversion, for ITS Table 3.3.2-1, Functional Units 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), 3.a.(2) (Containment Isolation, Phase A Isolation, Automatic Actuation Logic and Actuation Relays), 3.b.(2) (Containment Isolation, Phase B Isolation, Automatic Actuation Logic and Actuation Relays), 4.b (Steam Line Isolation, Automatic Actuation Logic and Actuation Relays), 5.a (Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays), 6.a (Auxiliary Feedwater, Automatic Actuation Logic and Actuation Relays), and 7.a (Automatic Switchover to Containment Sump, Automatic Actuation Logic and Actuation Relays). This is a more restrictive change to CTS and is justified in Discussion of Change M04. The proposed Surveillance Frequency for ITS SR 3.3.2.5 is every 18 months.** **Currently, SQN performs slave relay testing every refueling outage (18 months) which corresponds to the proposed 18-month Surveillance Frequency for ITS SR 3.3.2.5.** **SQN is not proposing to adopt WCAP-13877 as a basis for extending slave relay testing from 92 days to an 18 month frequency, because SQN does not have a Surveillance Requirement to perform slave relay testing in CTS, and slave relays are already tested at an 18-month frequency. However, it should be recognized that SQN was used as one of the reference plants for the development of WCAP-13877. SQN slave relay failure history, in addition to failure history from other plants, was used in WCAP-13877 to conclude that testing on an 18-month Surveillance Frequency was acceptable.**
Response Date/Time	**9/26/2014 9:25 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman**

	Kristy Bucholtz **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**9/26/2014 8:21 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**358**
NRC Question Number	**KAB015**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**9/26/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**9/26/2014 9:19 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**39**
NRC Question Number	**KAB016**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**L-4**
JFD Number	
JFD Bases Number	
Page Number(s)	**437**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 437 of Enclosure 2, Volume 8, L04 provides the discussion of adding a footnote in ITS to CTS functions 4.a, 4.b, 4.c, 4.d, and 4.e in Table 3.3-3. The footnote in ISTS Table 3.3.2-1 is, "(j) Except when all MSIVs are closed and [de-activated]," however in ITS Table 3.3.2-1 the equivalent footnote is, "(e) Except when all MSIVs are closed." ITS Table 3.3.2-1 footnote (j) states, "Unit 1[2] shutdown boards only." The discussion in L04 references ITS Table 3.3.2-1 footnote (j) and states that footnote (j) is "Except when all MSIVs are closed." Please correct this discrepancy or explain why this reference is correct.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:27 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**48**
NRC Question Number	**KAB016**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised 3.3.2 DOC L04.pdf** (15KB)
Attachment 2	
Response Statement	**In response to KAB016, discussion of change (DOC) L04 will be revised. Specifically, references to Footnote (j) will be revised to reference Footnote (e). The revised sentences will read, "ITS Table 3.3.2-1, Function 4. (Steam Line Isolation), 4.a (Manual Initiation), 4.b (Automatic Actuation Logic and Actuation Relays), 4.c (Containment Pressure High-High), 4.d.(1) (Steam Line Pressure Low), and 4.d.(2) (Steam Line Pressure Negative Rate – High) include a Footnote for MODES 2 and 3, Footnote (e). Footnote (e) states, 'Except when all MSIVs are closed.'"** **See Attachment 1 for the draft revised DOC L04.**
Response Date/Time	**5/27/2014 5:45 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/27/2014 4:45 AM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

OPERABLE." ITS Table 3.3.2-1 designates Condition C as the referenced Condition for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays while designating Condition S as the referenced Condition for Function 7.a (Automatic Switchover to Containment Sump, Automatic Actuation Logic and Actuation Relays). ITS LCO 3.3.1, ACTION C for Functions 1.b (Safety Injection, Automatic Actuation Logic and Actuation Relays), 2.b (Containment Spray, Automatic Actuation Logic and Actuation Relays), and 3.b.(2) (Containment Isolation Phase B, Automatic Actuation Logic and Actuation Relays) requires restoration of the inoperable train to OPERABLE status within 24 hours or be in MODE 3 within 30 hours and MODE 5 within 60 hours, and is modified by a Note stating, "One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE." ITS 3.3.2 Required ACTION S retains the CTS requirements of CTS Table 3.3-3 ACTION 15. This changes the CTS by allowing 24 hours for train maintenance to restore the train to an OPERABLE status before requiring a power reduction to MODE 3 within an additional 6 hours, increasing the allowed time to enter MODE 3 from 12 hours to 30 hours, and increases the allowance for entering MODE 5 from 42 hours (12 + 30) to 60 hours for inoperable Safety Injection, Containment Spray, or Containment Isolation Phase B Automatic Actuation Logic and Actuation Relays.

The purpose of CTS Table 3.3-3, ACTION 15 is to allow some time to restore the inoperable train before requiring a unit shutdown. These changes are acceptable and are the result of WCAP-14333-P-A, Revision 1 ("Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"), dated October 1998, or WCAP-15376-P-A, Revision 1 ("Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times"), dated March 2003 (or a combination of the WCAPs). TVA has performed evaluations of the applicable changes associated with the two WCAPs to justify the above changes. The evaluations supporting these changes are provided in Enclosure 4 of this submittal. This change is designated as less restrictive because more time is allowed in the ITS for the maintenance and testing of trains than was allowed in the CTS.

L04 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3, Functional Units 4 (Steam Line Isolation), 4.a. (Manual), 4.b. (Automatic Actuation Logic), 4.c. (Containment Pressure – High-High), and 4.d. (Steam Line Pressure – Low), are required to be OPERABLE in MODES 1, 2, and 3, while CTS Functional Unit 4.e. (Negative Steam Line Pressure Rate – High) is required to be OPERABLE in MODE 3. Note that CTS Table 3.3-3, Functional Units 4.d and 4.e have further limitations on OPERABILITY as delimitated in Note # and ##, respectively, that are not changing. ITS Table 3.3.2-1, Function 4. (Steam Line Isolation), 4.a (Manual Initiation), 4.b (Automatic Actuation Logic and Actuation Relays), 4.c (Containment Pressure High-High), 4.d.(1) (Steam Line Pressure Low), and 4.d.(2) (Steam Line Pressure Negative Rate – High) include a Footnote for MODES 2 and 3, Footnote (j). Footnote (j) states, "Except when all MSIVs are closed." This changes the CTS by making the Specification for these Functions not applicable in MODES 2 and 3 when all MSIVs are closed.

e

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

The purpose of the ITS Table 3.3.2-1 Function 4 Applicability is to provide an exception to clarify that the Steam Line Isolation instrumentation Functions are not required when the MSIVs 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 and licensing basis. When all the MSIVs are in the closed position, they are in their assumed accident position, thus the isolation instrumentation is not needed. In addition, the MSIVs are not required to be OPERABLE in MODES 2 and 3 when the valves are closed, thus there is no purpose in requiring the instrumentation that closes the valves to be OPERABLE. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L05 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3 requires Functional Unit 5.a (Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High) and 5.b (Turbine Trip and Feedwater Isolation - Automatic Actuation Logic) to be OPERABLE in MODES 1, 2, and 3. ITS Table 3.3.2-1 requires the same Functions (ITS Table 3.3.2-1 Functions 5.a and 5.b) to be OPERABLE in MODE 1, and in MODES 2 and 3 except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve, Footnote (k). This changes the CTS by not requiring the instrumentation to be OPERABLE when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

The purpose of the ITS Table 3.3.2-1 Functions 5.a and 5.b Applicability is to provide an exception to clarify that the Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High (P-14) instrumentation and the Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays are not required when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. In this condition, the Function will not need to function since the valves 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 and licensing basis. When all MFIVs, MFRVs, and MFRV bypass valves are in the closed position, they are 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.

L06 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3.3 footnote (a) is applicable to Functional Unit 6.f (Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump) "Minimum Channels OPERABLE" requirement. CTS Table 3.3.3 footnote (a) states that one channel may be inoperable during Mode 1 for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service. ITS 3.3.2 ACTION N is applicable Function 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps) and is modified by a similar Required Action Note. ITS 3.3.2 ACTION N Required Action Note states that one channel may

Enclosure 2, Volume 8, Rev. 0, Page 438 of 1148

Licensee Response/NRC Response/NRC Question Closure

Id	**53**
NRC Question Number	**KAB016**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/27/2014 2:17 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**40**
NRC Question Number	**KAB017**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**A-11**
JFD Number	
JFD Bases Number	
Page Number(s)	**417, 418, 473, 478, 507, 512**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 417 and 418 of Enclosure 2, Volume 8, A11 provides the discussion of the steam generator (SG) level P-14 interlock. Specifically, A11 discusses ITS Table 3.3.2-1 function 5.b, "SG Water level – High High (P-14)," being required to be operable in Modes 2 and 3 which is modified by footnote (k). However, on pages 473 and 507 of Enclosure 2, Volume 8, ITS shows the applicable modes or other specified conditions for ITS functions 5.a and 5.b to be "1, 2[(k)], 3[(i)]." On the bottom of pages 473 and 507, ITS shows that footnote (k) has been changed to (i) and ITS footnote (k) (on pages 478 and 512) states, "When one or more Main Feedwater Pump(s) are supplying Feedwater to steam generators." Please correct ITS functions 5.a and 5.b so that they reference footnote (i) in applicable mode 2 or explain why there is a difference in footnote references in modes 2 and 3 for ITS functions 5.a and 5.b.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:30 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**49**
NRC Question Number	**KAB017**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised 3.3.2 DOC A11 and ITS pages.pdf** (54KB)
Attachment 2	
Response Statement	**In response to KAB-017, discussion of change (DOC) A11 will be revised. Specifically, the reference to Note (k) will be revised to reference Note (i) The revised sentence will read, "ITS Table 3.3.2-1 links P-14 to Function 5.b (SG Water Level-High High (P-14)) requiring 3 channels per steam generator to be OPERABLE in MODES 1, 2 and 3, with MODES 2 and 3 modified by a Note (i) stating except when all MFIVs, MFRVs and MFRV bypass valves are closed or isolated by a closed manual valve."** **Additionally, ITS Table 3.3.2-1 (page 8 of 11), Function 5.a (Turbine Trip and Feedwater Isolation, Automatic Actuation Logic and Actuation Relays) and 5.b (Turbine Trip and Feedwater Isolation, SG Water Level – High High (P-14) will be revised. References to Footnote (k) will be changed to reference Footnote (i).** **Related changes to DOC L05 and CTS markups will be discussed in the response to KAB019.** **See Attachment 1 for the draft revised DOC A11 and ITS markups.**
Response Date/Time	**5/27/2014 5:50 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/27/2014 4:47 AM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

A10 CTS Table 3.3-3 Functional Units 4.a (Steam Line Isolation, Manual), 5.a (Turbine Trip & Feedwater Isolation, Steam Generator Water Level— High-High), 6.c.i.a (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Motor-Driven Pumps, Steam Generator Water Level--Low-Low (Adverse)), 6.c.i.b (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Motor Driven Pumps, Steam Generator Water Level--Low-Low (EAM)), 6.c.ii.a (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Turbine-Driven Pump, Steam Generator Water Level--Low-Low (Adverse)), and 6.c.ii.b (Auxiliary Feedwater, Main Stm. Gen. Water Level—Low-Low, Start Turbine Driven Pump, Steam Generator Water Level--Low-Low (EAM)), include the phrase "operating steam line," "in each operating loop," or "in each Operating Stm. Gen." in the "MINIMUM CHANNELS OPERABLE" column. ITS Table 3.3.2-1 Functions 4.a (Steam Line Isolation, Manual Initiation), 5.b (Turbine Trip and Feedwater Isolation, SG Water Level - High High (P-14)), 6.b.(1) (Auxiliary Feedwater, SG Water Level - Low Low, Adverse), or 6.b.(2) (Auxiliary Feedwater, SG Water Level - Low Low, EAM), "Required Channels" column does not contain this information. This changes the CTS by removing the phrases "operating steam line," "in each operating loop," or "in each Operating Stm. Gen."

The purpose of the phrases "in each operating loop," or "in each Operating Stm. Gen." is to allow for unit operation with less than all four steam lines, RCS loops, or steam generators in operation. Although CTS Table 3.3-3 Minimum Channels OPERABLE column includes the information, relating to "operating," the CTS Functional Units associated ACTIONS require action to be taken when the number of OPERABLE channels is one less than the Total Number of Channels, which does not include the phrases relating to "operating." ITS Table 3.3.2-1 "Required Channels" column for these Functions retains the OPERABLE channel requirements contained in CTS Table 3.3-3 "Total No. of Channels" column. This change is acceptable because the OPERABILITY requirements associated with the number of OPERABLE channels is the same in CTS as in ITS. This change is designated as administrative because it does not result in technical changes to the CTS.

A11 CTS Table 3.3-3 Functional Unit 8.c, Table 3.3-4 Functional Unit 8.d, and Table 4.3-2 Functional Unit 8.c provide requirements for the Engineered Safety Feature Actuation System Interlock – Steam Generator Level P-14. CTS Table 3.3-3, requires that Functional Unit 8.c have 3 channels per loop OPERABLE in MODES 1 and 2, CTS Table 3.3-4 requires the nominal trip set point and allowable value to be set in accordance with Functional Unit 5 (Turbine Trip and Feedwater Isolation) for Functional Unit 8.d, and CTS Table 4.3-2 provides Surveillance Requirements for Functional Unit 8.c. With less than 3 channels per loop OPERABLE in MODES 1 and 2, ACTION 22c requires the interlock be declared inoperable and verification that all affected channels for CTS Functional Unit 5.a (Turbine Trip & Feedwater Isolation - Steam Generator Water Level High-High) are OPERABLE or to apply the appropriate ACTION statement(s) for Functional Unit 5.a. ITS Table 3.3.2-1 links P-14 to Function 5.b (SG Water Level - High High (P-14)) requiring 3 channels per steam generator to be OPERABLE in MODES 1, 2, and 3, with MODES 2 and 3 modified by Note (~~k~~ $\boxed{i}$) stating except when all MFIVs, MFRVs, and MFRV bypass valves are closed or

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

isolated by a closed manual valve. In addition, CTS Table 4.3-2 requires a CHANNEL CALIBRATION every 18 months for Functional Unit 8.c as is required by ITS SR 3.3.2.8 for Function 5.b. This changes the CTS by linking P-14 directly to the Steam Generator Water level High-High Function (CTS Functional Unit 5.a, ITS Function 5.b) instead of indirectly with a separate interlock Functional Unit.

This change proposes to eliminate CTS Tables 3.3-3 and 4.3-2 Functional Unit 8.c (Table 3.3-4 Functional Unit 8.d) as a separate line item. The SG Water Level - High High interlock Function is adequately addressed in the ESFAS Specification as Function 5.b, SG Water Level High-High. The requirement to address this function separately as an ESFAS Interlock is unnecessary. All necessary requirements (Applicable MODES, Required Channels, Condition, Surveillance Requirements, and setpoints) for the SG Water Level High-High function are adequately addressed by the existing Turbine Trip and Feedwater Isolation Function 5.b on ITS ESFAS Table 3.3.2-1. The Required Action associated with Function 5.b is to place the inoperable channel in trip. The requirement to place the inoperable channel in trip is appropriate and sufficient for the SG Water Level High-High Function as it is for the majority of other trip functions on Table 3.3.2-1. The requirement to verify interlock status does not impose any additional requirements beyond those required for the SG Water Level High-High function. This change is designated as administrative because it does not result in a technical change to the CTS.

A12 CTS Table 3.3-3, Table 3.3-4, and Table 4.3-2, contain requirements for Functional Unit 6.a (Auxiliary Feedwater, Manual) and Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) both of which are the method of manually starting the Auxiliary Feedwater Pumps. In addition, CTS Table 3.3-3 contains ACTION 24 which is only associated with Functional Unit 6.a. ITS Table 3.3.2-1 does not contain a Function similar to CTS Functional Unit 6.a, only Function 6.c (Safety Injection). This changes the CTS by eliminating a duplicate Functional Unit and its associated requirements.

The purpose of CTS Tables 3.3-3, 3.3-4, and 4.3-2 requirements for Functional Unit 6.a is to ensure two channels are OPERABLE to manually start Auxiliary Feedwater. The two channels required associated with Functional Unit 6.a are the two Safety Injection System Actuate hand switches, which are the same channels as Functional Unit 1.a (Safety Injection, Manual). CTS Tables 3.3-3, 3.3-4, and 4.3-2 contain similar requirements for Functional Unit 1.a (Safety Injection, Manual) as Functional Unit 6.a. Because CTS also requires Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) that refers to CTS Functional Unit 1 for its requirements and ITS Table 3.3.2-1 Function 6.c refers to Function 1 (Safety Injection) for its requirements, listing a separate manual Function for Auxiliary Feedwater Pump actuation is unnecessary and is combined with ITS Function 6.c (Auxiliary Feedwater, Safety Injection). In addition, CTS Table 3.3-3 ACTION 24 is only associated with Functional Unit 6.a. Because CTS Functional Unit 6.a is being eliminated, ACTION 24 is no longer necessary and is also being eliminated. This change is designated as administrative because it does not result in a technical change to the CTS.

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CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.2~~A~~

Table 3.3-3

Table 3.3.2-1 (page 8 of 11)
Engineered Safety Feature Actuation System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	[NOMINAL ~~(j)~~ TRIP SETPOINT] 3
	5. Turbine Trip and Feedwater Isolation						
5.b	a. Automatic Actuation Logic and Actuation Relays	1, 2 ~~(k)~~ i, ~~[3]~~ ~~(k)~~ i	2 trains	H~~[G]~~	SR 3.3.2.2 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA 3
5.a	b. SG Water Level - High High (P-14)	1,2 ~~(k)~~ i, ~~[3]~~ ~~(k)~~ i	~~[~~3~~]~~ per SG	~~[~~D~~]~~	SR 3.3.2.1 4 (b)(c) SR 3.3.2.~~5~~ 8 (b)(c) SR 3.3.2.~~9~~ 9 SR 3.3.2.~~10~~	≤ ~~[84.2]~~ 81.7%	~~[82.4]~~ 81% 3
DOC A08	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
	6. Auxiliary Feedwater						
6.b	a. Automatic Actuation Logic and Actuation Relays ~~(Solid State Protection System)~~	1,2,3	2 trains	~~G~~ H	SR 3.3.2.2 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
	~~b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.3~~	~~NA~~	~~NA~~ 2

2

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. 2 3

DOC L05 (~~k~~ i) Except when all MFIVs, MFRVs, ~~[~~and ~~associated~~ MFRV bypass valves~~]~~ are closed ~~and [de-activated]~~ ~~[~~or isolated by a closed manual valve~~]~~. 3

~~REVIEWER'S NOTE~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 4

CTS

ESFAS Instrumentation ~~(Without Setpoint Control Program)~~ 1
3.3.2~~A~~

Table 3.3-3

Table 3.3.2-1 (page 8 of 11)
Engineered Safety Feature Actuation System Instrumentation

CTS	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~[~~NOMINAL ~~(j)~~ TRIP SETPOINT~~]~~ 3
	5. Turbine Trip and Feedwater Isolation						
5.b	a. Automatic Actuation Logic and Actuation Relays	1, 2 ~~(k)~~, ~~[~~3~~]~~ ~~(k)~~ i	2 trains	H~~[G]~~	SR 3.3.2.2 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA 3
5.a	b. SG Water Level - High High (P-14)	1,2 ~~(k)~~, ~~[~~3~~]~~ ~~(k)~~ i	~~[~~3~~]~~ per SG	~~[~~D~~]~~	SR 3.3.2.1 4 SR 3.3.2.~~5~~ 8 (b)(c) SR 3.3.2.~~9~~ 9 (b)(c) SR 3.3.2.~~10~~	≤ ~~[84.2]~~ 81.7%	~~[82.4]~~ 81% 3
DOC A08	c. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
	6. Auxiliary Feedwater						
6.b	a. Automatic Actuation Logic and Actuation Relays ~~(Solid State Protection System)~~	1,2,3	2 trains	~~G~~ H	SR 3.3.2.2 3 SR 3.3.2.~~4~~ 5 SR 3.3.2.~~6~~	NA	NA
	~~b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS)~~	~~1,2,3~~	~~2 trains~~	~~G~~	~~SR 3.3.2.3~~	~~NA~~	~~NA~~ 2

3.3.2.1, and ACTION (b) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

3.3.2.1, and ACTION (c) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The ~~NTSP and the~~ methodologies used to determine the as-found and as-left tolerances are specified in ~~[insert the facility FSAR reference or the name of any document incorporated into the facility FSAR by reference]~~ UFSAR Section 7.1.2. 2 3

DOC L05 (~~k~~ i) Except when all MFIVs, MFRVs, ~~[~~and ~~associated~~ MFRV bypass valves~~]~~ are closed ~~and [de-activated]~~ ~~[~~or isolated by a closed manual valve~~]~~. 3

~~REVIEWER'S NOTE~~
~~(j) Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~ 4

Enclosure 2, Volume 8, Rev. 0, Page 507 of 1148

Licensee Response/NRC Response/NRC Question Closure

Id	**54**
NRC Question Number	**KAB017**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/27/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/27/2014 2:17 PM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**41**
NRC Question Number	**KAB018**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**A-11**
JFD Number	
JFD Bases Number	
Page Number (s)	**417, 418**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 417 and 418 of Enclosure 2, Volume 8, A11 provides the discussion of the steam generator (SG) level P-14 interlock. The discussion states, "The SG Water Level – High High interlock Function is adequately addressed in the ESFAS Specification as Function 5.b, SG Water Level High-High." Please explain which ESFAS Specification is being referred to ITS or CTS.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:31 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**59**
NRC Question Number	**KAB018**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised ITS 3.3.2 DOC A11.pdf** (13KB)
Attachment 2	
Response Statement	**In response to KAB018, discussion of change (DOC) A11 will be revised. The ESFAS Specification being referred to is, ITS ESFAS Specification, Function 5.b, Steam Generator Water Level High-High (P-14) on ITS ESFAS Table 3.3.2-1. The revised sentence will read, “The SG Water Level – High High interlock Function is adequately addressed in the ITS ESFAS Specification as ITS Table 3.3.2-1, Function 5.b, SG Water Level High-High (P-14).”** **See Attachment 1 for the draft revised DOC A11.**
Response Date/Time	**5/27/2014 4:30 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/27/2014 3:26 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

isolated by a closed manual valve. In addition, CTS Table 4.3-2 requires a CHANNEL CALIBRATION every 18 months for Functional Unit 8.c as is required by ITS SR 3.3.2.8 for Function 5.b. This changes the CTS by linking P-14 directly to the Steam Generator Water level High-High Function (CTS Functional Unit 5.a, ITS Function 5.b) instead of indirectly with a separate interlock Functional Unit.

This change proposes to eliminate CTS Tables 3.3-3 and 4.3-2 Functional Unit 8.c (Table 3.3-4 Functional Unit 8.d) as a separate line item. The SG Water Level - High High interlock Function is adequately addressed in the ITS ESFAS Specification as ITS Table 3.3.2-1, Function 5.b, SG Water Level High-High (P-14). The requirement to address this function separately as an ESFAS Interlock is unnecessary. All necessary requirements (Applicable MODES, Required Channels, Condition, Surveillance Requirements, and setpoints) for the SG Water Level High-High function are adequately addressed by the existing Turbine Trip and Feedwater Isolation Function 5.b on ITS ESFAS Table 3.3.2-1. The Required Action associated with Function 5.b is to place the inoperable channel in trip. The requirement to place the inoperable channel in trip is appropriate and sufficient for the SG Water Level High-High Function as it is for the majority of other trip functions on Table 3.3.2-1. The requirement to verify interlock status does not impose any additional requirements beyond those required for the SG Water Level High-High function. This change is designated as administrative because it does not result in a technical change to the CTS.

A12 CTS Table 3.3-3, Table 3.3-4, and Table 4.3-2, contain requirements for Functional Unit 6.a (Auxiliary Feedwater, Manual) and Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) both of which are the method of manually starting the Auxiliary Feedwater Pumps. In addition, CTS Table 3.3-3 contains ACTION 24 which is only associated with Functional Unit 6.a. ITS Table 3.3.2-1 does not contain a Function similar to CTS Functional Unit 6.a, only Function 6.c (Safety Injection). This changes the CTS by eliminating a duplicate Functional Unit and its associated requirements.

The purpose of CTS Tables 3.3-3, 3.3-4, and 4.3-2 requirements for Functional Unit 6.a is to ensure two channels are OPERABLE to manually start Auxiliary Feedwater. The two channels required associated with Functional Unit 6.a are the two Safety Injection System Actuate hand switches, which are the same channels as Functional Unit 1.a (Safety Injection, Manual). CTS Tables 3.3-3, 3.3-4, and 4.3-2 contain similar requirements for Functional Unit 1.a (Safety Injection, Manual) as Functional Unit 6.a. Because CTS also requires Functional Unit 6.d (Auxiliary Feedwater, Safety Injection) that refers to CTS Functional Unit 1 for its requirements and ITS Table 3.3.2-1 Function 6.c refers to Function 1 (Safety Injection) for its requirements, listing a separate manual Function for Auxiliary Feedwater Pump actuation is unnecessary and is combined with ITS Function 6.c (Auxiliary Feedwater, Safety Injection). In addition, CTS Table 3.3-3 ACTION 24 is only associated with Functional Unit 6.a. Because CTS Functional Unit 6.a is being eliminated, ACTION 24 is no longer necessary and is also being eliminated. This change is designated as administrative because it does not result in a technical change to the CTS.

Licensee Response/NRC Response/NRC Question Closure

Id	**74**
NRC Question Number	**KAB018**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:36 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**42**
NRC Question Number	**KAB019**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**L-5**
JFD Number	
JFD Bases Number	
Page Number(s)	**438, 473, 507**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 438 of Enclosure 2, Volume 8, L05 provides the discussion of ITS Table 3.3.2-1 functions 5.a and 5.b being required to be operable in Modes 2 and 3 which is modified by footnote (k). However, on pages 473 and 507 of Enclosure 2, Volume 8, ITS shows functions 5.a and 5.b's applicable modes or other specified conditions to be "1, 2[(k)], 3[(i)]." On the bottom of pages 473 and 507 ITS shows that footnote (k) has been changed to (i) and ITS footnote (k) states, "When one or more Main Feedwater Pump(s) are supplying Feedwater to steam generators." Please correct L05's reference to footnote (k) or explain why footnote (k) is correct.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:36 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**58**
NRC Question Number	**KAB019**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 3.3.2 revised DOC L05 and CTS.pdf** (47KB)
Attachment 2	
Response Statement	**In response to KAB019, the reference to Footnote (k) in discussion of change (DOC) L05, on page 438 of Enclosure 2, Volume 8, will be revised to reference Footnote (i). The revised sentence will read, "ITS Table 3.3.2-1 requires the same Functions (ITS Table 3.3.2-1 Functions 5.a and 5.b) to be OPERABLE in MODE 1, and in MODES 2 and 3 except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve, Footnote (i)." This change will also be reflected in the CTS markups for CTS Functions 5.a and 5.b on CTS Table 3.3-3 (Units 1 and 2) and the associated L05 insert on CTS Table 3.3-3, Table Notation (Unit 2).** **Related changes to DOC A11 and ITS markups will be discussed in the response to KAB017.** **See Attachment 1 for the draft revised DOC L05 and CTS markups for Units 1 and 2.**
Response Date/Time	**5/27/2014 4:25 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/27/2014 3:23 PM**
Date Modified	
Modified By	

DISCUSSION OF CHANGES
ITS 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION

The purpose of the ITS Table 3.3.2-1 Function 4 Applicability is to provide an exception to clarify that the Steam Line Isolation instrumentation Functions are not required when the MSIVs 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 and licensing basis. When all the MSIVs are in the closed position, they are in their assumed accident position, thus the isolation instrumentation is not needed. In addition, the MSIVs are not required to be OPERABLE in MODES 2 and 3 when the valves are closed, thus there is no purpose in requiring the instrumentation that closes the valves to be OPERABLE. This change is designated as less restrictive because the LCO requirements are applicable in fewer operating conditions than in the CTS.

L05 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3-3 requires Functional Unit 5.a (Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High) and 5.b (Turbine Trip and Feedwater Isolation - Automatic Actuation Logic) to be OPERABLE in MODES 1, 2, and 3. ITS Table 3.3.2-1 requires the same Functions (ITS Table 3.3.2-1 Functions 5.a and 5.b) to be OPERABLE in MODE 1, and in MODES 2 and 3 except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve, Footnote (~~k~~ i). This changes the CTS by not requiring the instrumentation to be OPERABLE when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

The purpose of the ITS Table 3.3.2-1 Functions 5.a and 5.b Applicability is to provide an exception to clarify that the Turbine Trip and Feedwater Isolation Steam Generator Water Level - High High (P-14) instrumentation and the Turbine Trip and Feedwater Isolation Automatic Actuation Logic and Actuation Relays are not required when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve. In this condition, the Function will not need to function since the valves 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 and licensing basis. When all MFIVs, MFRVs, and MFRV bypass valves are in the closed position, they are 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.

L06 *(Category 2 – Relaxation of Applicability)* CTS Table 3.3.3 footnote (a) is applicable to Functional Unit 6.f (Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump) "Minimum Channels OPERABLE" requirement. CTS Table 3.3.3 footnote (a) states that one channel may be inoperable during Mode 1 for up to 4 hours when placing the second main feedwater (MFW) pump in service or removing one of two MFW pumps from service. ITS 3.3.2 ACTION N is applicable Function 6.e (Auxiliary Feedwater, Trip of Main Feedwater Pumps) and is modified by a similar Required Action Note. ITS 3.3.2 ACTION N Required Action Note states that one channel may

ITS — A01 — ITS 3.3.2

Table 3.3.2-1 — ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01 A02 A11

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	REQUIRED ~~MINIMUM~~ CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	5. TURBINE TRIP & FEEDWATER ISOLATION						
5.b	a. Steam Generator Water Level—High-High (P-14)	~~3/loop~~	~~2/loop in any operating loop~~	3 per SG ~~2/loop in each operating loop~~	1, 2, 3 ~~(k)~~ (i)	17	D
5.a	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3	23	H
	INSERT 2						
	6. AUXILIARY FEEDWATER						
	~~a. Manual Initiation~~	~~2~~	~~1~~	~~2~~	~~1, 2, 3~~	~~24~~	
6.a	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3	23	H
6.b	c. Main Stm. Gen. Water Level—Low-Low						
	i. ~~Start Motor-Driven Pumps~~						
6.b.(1)	a. Steam Generator Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	3 ~~2~~/Stm. Gen. ~~in each operating Stm. Gen~~	1, 2, 3	36	I
6.b.(2)	b. Steam Gen Water Level--Low-Low (EAM)	~~3/Stm. Gen~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	3 ~~2~~/Stm. Gen. ~~in each operating Stm. Gen.~~	1, 2, 3	36	I
6.b.(1) 6.b.(2)	c. RCS Loop∆T	~~4(1/loop)~~	~~2~~	4 ~~3~~	1, 2, 3	37	K
6.b.(1)	d. Containment Pressure (EAM)	4	~~2~~	4 ~~3~~	1, 2, 3	38	J

A02 L05 M04 A08 A10 A12 LA04

ITS | A01 | ITS 3.3.2
Table 3.3.2-1 | | ITS ACTION

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LA01 A02 A11 A02 L05 A10 A08 M04 A12 LA04

ITS	FUNCTIONAL UNIT	~~TOTAL NO. OF CHANNELS~~	~~CHANNELS TO TRIP~~	~~MINIMUM~~ REQUIRED CHANNELS OPERABLE	APPLICABLE MODES	ACTION	ITS ACTION
	5. TURBINE TRIP & FEEDWATER ISOLATION						
5.b	a. Steam Generator Water Level—High-High (P-14)	~~3/loop~~	~~2/loop in any operating loop~~	~~2/loop in each operating loop~~ 3 per SG	1, 2, 3	17 (~~k~~) j	D
5.a	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3	23	H
	INSERT 2						
	6. AUXILIARY FEEDWATER						
	~~a. Manual Initiation~~	~~2~~	~~1~~	~~2~~	~~1, 2, 3~~	~~24~~	
6.a	b. Automatic Actuation Logic and Actuation Relays	~~2~~	~~1~~	2	1, 2, 3	23	H
6.b	c. Main Steam Generator Water Level--Low-Low						
	i. ~~Start Motor-Driven Pumps~~						
6.b.(1)	a. Steam Gen. Water Level--Low-Low (Adverse)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~ 3/Stm. Gen. ~~in each operating Stm. Gen.~~	1, 2, 3	36	I
6.b.(2)	b. Steam Gen. Water Level--Low-Low (EAM)	~~3/Stm. Gen.~~	~~2/Stm. Gen. in any operating Stm. Gen.~~	~~2~~ 3/Stm. Gen. ~~in each operating Stm. Gen.~~	1, 2, 3	36	I
6.b.(1) 6.b.(2)	c. RCS Loop ΔT	~~4(1/loop~~)	~~2~~	~~3~~ 4	1, 2, 3	37	K

Enclosure 2, Volume 8, Rev. 0, Page 383 of 1148

ITS

A01

ITS 3.3.2

TABLE 3.3-3 (Continued)

INSERT 3

A13

TABLE NOTATION

INSERT 4

A14

Table 3.3.2-1 Footnote (a) and Footnote (f)

~~Trip function may be bypassed in this MODE below P-11 (Pressurizer Pressure Block of Safety Injection) setpoint.~~

A15

INSERT 5

L04

Table 3.3.2-1 Footnote (g)

~~Trip function automatically blocked above P-11 and may be blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.~~

(j) Except when all MSIV's are closed.

L05

(~~k~~) Except when all MFIVs, MFRVs, and MFRV bypass valves are closed or isolated by a closed manual valve.

i

ACTION STATEMENTS

ACTION S

ACTION 15 - With the number of OPERABLE Channels one less than the Total Number of Channels, be in HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.

ACTION S Note

ACTION 16 - Deleted.

ACTION D

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

72

L07

a. The inoperable channel is placed in the tripped condition within ~~6~~ hours.

12

L08

b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to ~~4~~ hours for surveillance testing of other channels per Specification 4.3.2.1.1.

M07

Add proposed Required Action D.2.1 and D.2.2

72 for ACTION E, otherwise 6

L09

ACTION E
ACTION P

ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels operation may proceed provided the inoperable channel is placed in the bypassed condition within ~~6~~ hours and the Minimum Channels OPERABLE requirement is met; one additional channel may be bypassed for up to ~~4~~ hours for surveillance testing per Specification 4.3.2.1.1.

L10

12 for ACTION E, otherwise 4

M08

Add proposed Required Action E.2.1 and E.2.2

ACTION 19 - With less than the Minimum Channels OPERABLE, operation may continue provided the containment purge supply and exhaust valves are maintained closed.

See ITS 3.3.6

ACTION B
ACTION N

ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

A16

Add proposed Required Action P.2.1 and P.2.2

M09

Licensee Response/NRC Response/NRC Question Closure

Id	**75**
NRC Question Number	**KAB019**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:37 AM**
Date Modified	
Modified By	

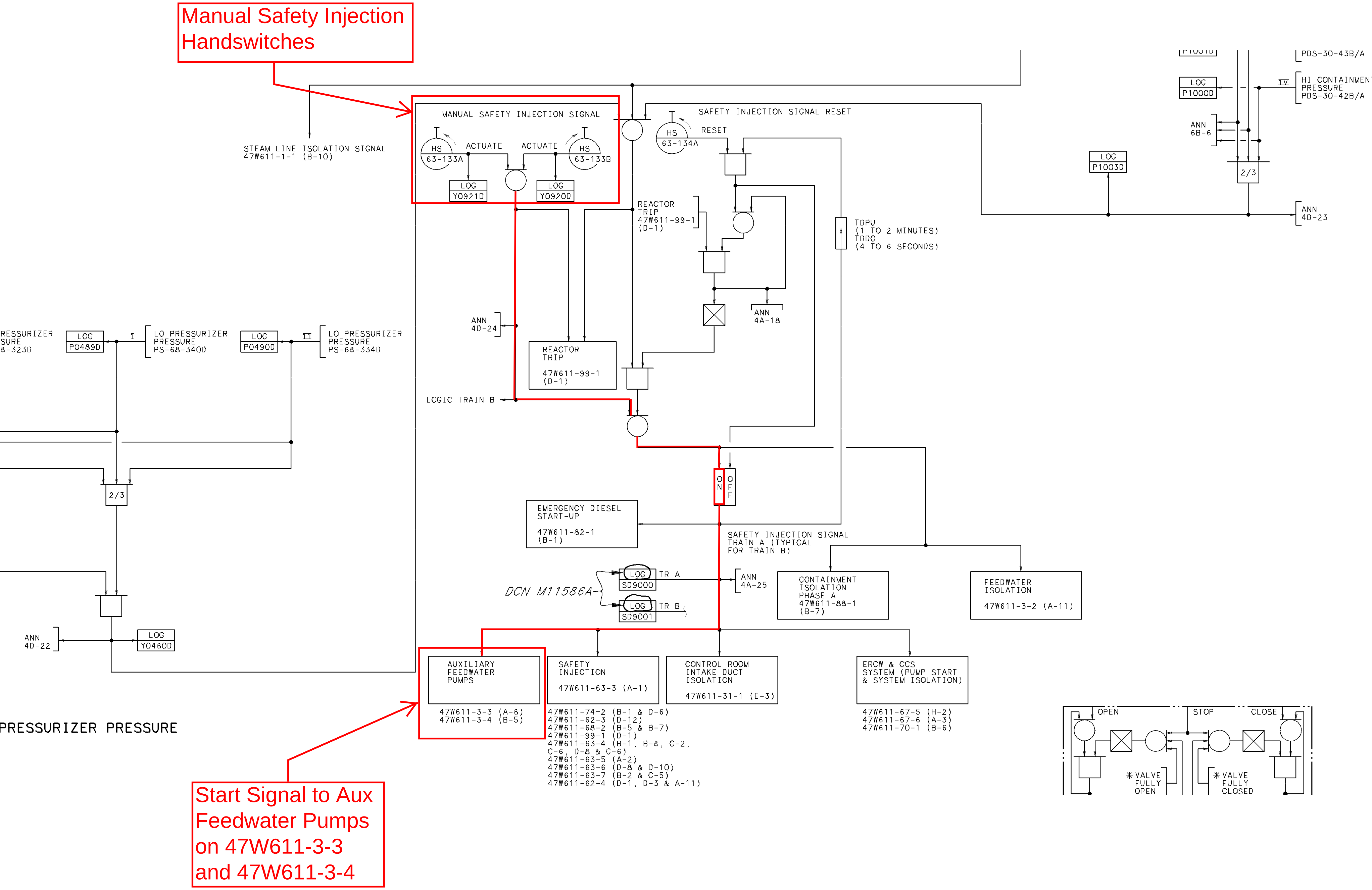
ITS NRC Questions

Id	**43**
NRC Question Number	**KAB020**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	**A-12**
JFD Number	
JFD Bases Number	
Page Number(s)	**418**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 418 of Enclosure 2, Volume 8, A12 provides the discussion of the manual initiation of Auxiliary Feedwater. A12 states that the Auxiliary Feedwater manual initiation function is a duplicate function to the safety injection manual initiation function. Please provide the logic diagrams and/or electrical schematics that show that Auxiliary Feedwater and Safety Injection systems are manually initiated by the safety injection system actuate hand switches circuitry and provide a summary that walks through the logic and/or electrical schematics.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:39 AM**
Notification	**Scott Bowman Michelle Conner Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**

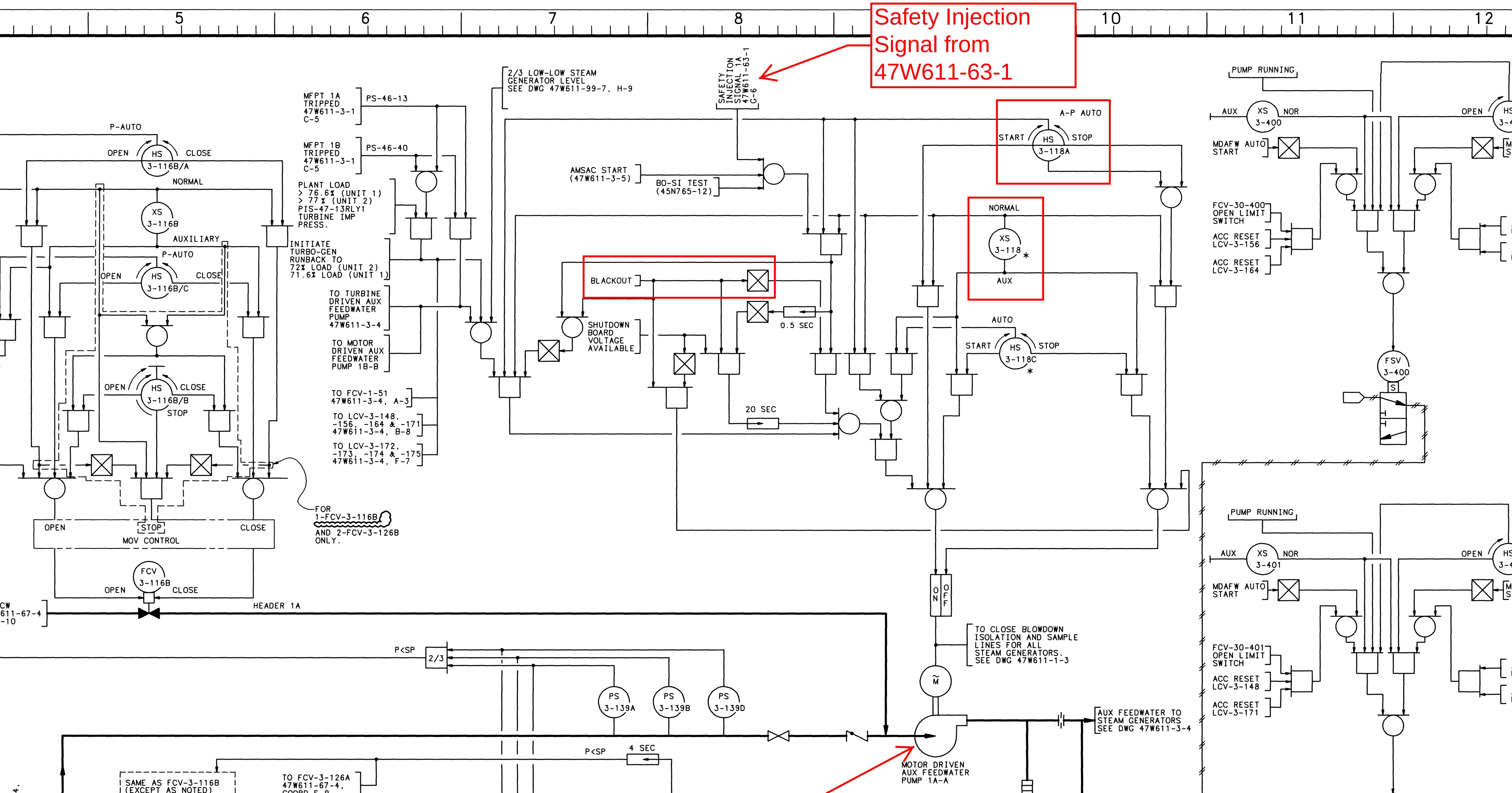
Licensee Response/NRC Response/NRC Question Closure

Id	**60**
NRC Question Number	**KAB020**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 Logic Prints System 3 and 63.pdf** (338KB)
Attachment 2	
Response Statement	**In response to KAB020, Attachment 1 illustrates the logic associated with the manual initiation of Safety Injection and the Auxiliary Feedwater System. Pages 1, 2, and 3 are excerpts from TVA Logic Prints 4747W611-63-1, 47W611-3-3, and 47W611-3-4, respectively.** **The manual Safety Injection handswitches are shown on page 1. Either of these two switches, both located in the main control room, will initiate a manual safety injection.** **Upon initiation of either of these handswitches, a signal is sent to the Auxiliary Feedwater System. Page 2 shows the input to the motor driven auxiliary feedwater pump. Page 3 shows the input to the turbine driven auxiliary feedwater pump.** **On page 2, when the safety injection signal is received, the motor driven auxiliary feedwater pump will automatically start, provided Handswitch, HS-3-118A, is in A-P Auto, Handswitch, XS−3−118 is in Normal, and there is no blackout condition.** **On page 3, when the Safety Injection signal is received, the turbine driven auxiliary feedwater pump will automatically start by opening Trip and Throttle Valve, FCV-1-51, provided Handswitch, XS-46-57, is in Normal and no pump trip conditions exist.**
Response Date/Time	**5/28/2014 5:50 AM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/28/2014 4:49 AM**
Date Modified	
Modified By	

TVA Logic Print
47W611-63-1



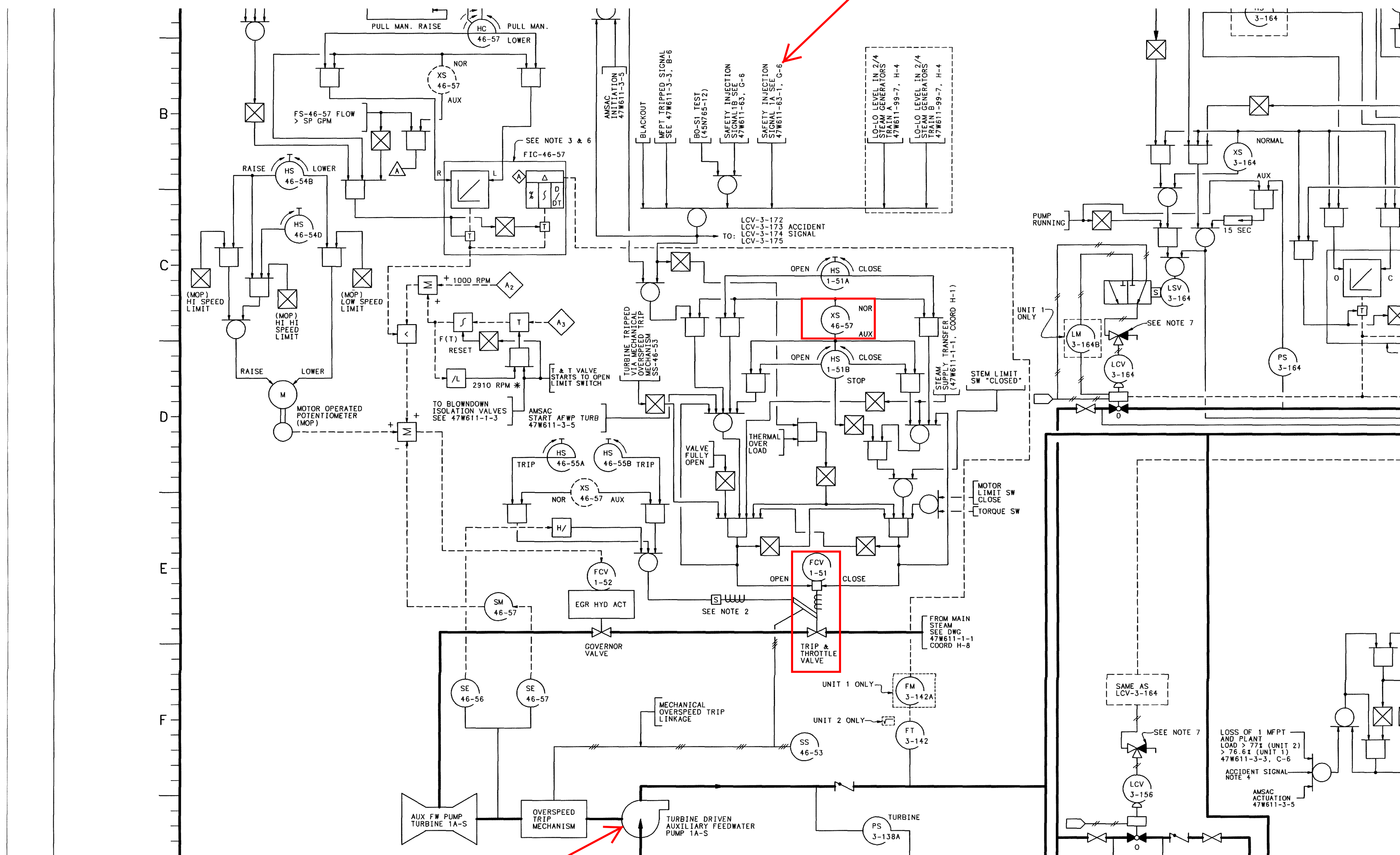
TVA Logic Print
47W611-3-3



Motor Driven Aux
Feedwater Pump

TVA Logic Print
47W611-3-4

Safety Injection
Signal from
47W611-63-1



Turbine Driven Aux
Feedwater Pump

Licensee Response/NRC Response/NRC Question Closure

Id	**77**
NRC Question Number	**KAB020**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:37 AM**
Date Modified	
Modified By	

Licensee Response/NRC Response/NRC Question Closure

Id	**76**
NRC Question Number	**KAB020**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:37 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**44**
NRC Question Number	**KAB021**
Category	**Editorial**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**478, 512**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 478 and 512 of Enclosure 2, Volume 8, TVA proposes to add footnote (j) which states, "Unit 1[2] shutdown boards only," to ITS Table 3.3.2-1 functions 6.d.1, "Auxiliary Feedwater Loss of Offsite Power Voltage Sensors," and 6.d.2, "Auxiliary Feedwater Loss of Offsite Power Load Shed Timer." CTS Table 3.3-3 functional units 6.e.1, "Auxiliary Feedwater Loss of Power Start Voltage Sensor," and 6.e.2, "Auxiliary Feedwater Loss of Power Start Load Shed Timer," include addition of footnote **. Footnote ** for unit 1 states, "Unit 1 shutdown boards only, and for unit 2 states, "Unit 2 shutdown boards only." TVA is proposing to maintain separate ITS for unit 1 and unit 2. However, the footnote (j) is written with reference to both units 1 and 2. Provide a correction to footnote (j) on pages 478 and 512 that removes reference to the other unit, or explain why both units needs to be referenced in each individual ITS.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**
Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:41 AM**
Notification	**Scott Bowman Michelle Conner Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**62**
NRC Question Number	**KAB021**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 revised pages for Insert 14.pdf** (20KB)
Attachment 2	
Response Statement	**In response to KAB021, Insert 14 on pages 478 and 512 of Enclosure 2, Volume 8, for ITS Table 3.3.2-1 will be revised. Specifically, Footnote (j) will be revised to remove the reference to the opposite unit's shutdown boards. Insert 14 for Unit 1 will read, "(j) Unit 1 shutdown boards only." Insert 14 for Unit 2 will read, "(j) Unit 2 shutdown boards only."** **See Attachment 1 for a draft revised Insert 14 for Unit 1 and Unit 2.**
Response Date/Time	**5/28/2014 2:55 PM**
Closure Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**5/28/2014 1:57 PM**
Date Modified	
Modified By	

CTS 3.3.2

2

INSERT 13

Table 3.3-3
Table 3.3-4
Table 4.3-2

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 6.h	g. Auxiliary Feedwater Suction Transfer Time Delays						
Table 3.3-3 6.h.1	(1) Motor-Driven Pump	1,2,3	1 per pump	O	SR 3.3.2.8(b)(c)	≤ 4.4 seconds and ≥ 3.6 seconds	4 seconds
Table 3.3-3 6.h.2	(2) Turbine-Driven Pump	1,2,3	2 per pump	O	SR 3.3.2.8(b)(c)	≤ 6.05 seconds and ≥ 4.95 seconds	5.5 seconds

8

INSERT 14

Table 3.3-3 Note ** — (j) Unit 1~~[2]~~ shutdown boards only.

Table 3.3-3 Note (b) — (k) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

Enclosure 2, Volume 8, Rev. 0, Page 478 of 1148

CTS

3.3.2

2

INSERT 13

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
Table 3.3-3 Table 3.3-4 Table 4.3-2							
Table 3.3-3 6.h	g. Auxiliary Feedwater Suction Transfer Time Delays						
Table 3.3-3 6.h.1	(1) Motor-Driven Pump	1,2,3	1 per pump	O	SR 3.3.2.8(b)(c)	≤ 4.4 seconds and ≥ 3.6 seconds	4 seconds
Table 3.3-3 6.h.2	(2) Turbine-Driven Pump	1,2,3	2 per pump	O	SR 3.3.2.8(b)(c)	≤ 6.05 seconds and ≥ 4.95 seconds	5.5 seconds

8

INSERT 14

Table 3.3-3 Note **

(j) Unit ~~1~~[2] shutdown boards only.

Table 3.3-3 Note (b)

(k) When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators.

Licensee Response/NRC Response/NRC Question Closure

Id	**78**
NRC Question Number	**KAB021**
Select Application	**NRC Question Closure**
Attachment 1	
Attachment 2	
Response Statement	
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Question Closure Date	**5/30/2014**
Notification	**Scott Bowman Michelle Conner Khadijah Hemphill Andrew Hon Lynn Mynatt Ray Schiele Roger Scott**
Added By	**Kristy Bucholtz**
Date Added	**5/30/2014 8:38 AM**
Date Modified	
Modified By	

ITS NRC Questions

Id	**45**
NRC Question Number	**KAB022**
Category	**Technical**
ITS Section	**3.3**
ITS Number	**3.3.2**
DOC Number	
JFD Number	
JFD Bases Number	
Page Number(s)	**477, 511**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On pages 477 and 511 of Enclosure 2, Volume 8, the number of required channels in ITS Table 3.3.2-1 for function 6.d.2, "Auxiliary Feedwater Loss of Offsite Power Load Shed Timer," states, "1 per shutdown board." CTS Table 3.3-3 total number of channels column states that there are, "2/shutdown board," for functional unit 6.e.2, "Auxiliary Feedwater Loss of Power Start Load Shed Timer." CTS Table 3.3-3 ACTION 35 requires (a) with the number of operable channels one less than the total number of channels for voltage sensors, restore the inoperable channel to operable status within 6 hours or enter applicable limiting condition(s) for operation and action(s) for the associated auxiliary feedwater pump made inoperable by the channel, and (b) With the number of operable channels less than the total number of channels by more than one for voltage sensors or timers, restore all but one channel to operable status within 1 hour or enter applicable limiting condition(s) for operation and action(s) for the associated auxiliary feedwater pump made inoperable by the channels. CTS ACTION 35 is reflected in ITS 3.3.2 Conditions L and M. Please explain the reasoning for why TVA did not chose to adjust ITS Condition L to address the inoperability of one load shed timer and add 2 per shutdown board in the required channels column for ITS Table 3.3.2-1 function 6.d.2.**
Attach File 1	
Attach File 2	
Issue Date	**5/9/2014**

Added By	**Kristy Bucholtz**
Date Modified	
Modified By	
Date Added	**5/9/2014 8:42 AM**
Notification	**Scott Bowman** **Michelle Conner** **Andrew Hon** **Lynn Mynatt** **Ray Schiele** **Roger Scott**

Licensee Response/NRC Response/NRC Question Closure

Id	**266**
NRC Question Number	**KAB022**
Select Application	**Licensee Response**
Attachment 1	**Attachment 1 KAB022.pdf** (719KB)
Attachment 2	
Response Statement	**In response to RAI KAB022, the following information is provided regarding the required number of OPERABLE load shed timers as reflected in ITS Table 3.3.2-1, Function 6.d(2), Auxiliary Feedwater, Loss of Offsite Power, Load Shed Timer.** **By letter dated August 18, 2004 (ADAMS Accession Number ML042430467), SQN requested a license amendment to revise the required minimum channels operable for the auxiliary feedwater (AFW) and emergency diesel generator (EDG) loss of power start timers in CTS Table 3.3-3 from 2 per shutdown board to 1 per shutdown board. The change in minimum channels operable for the AFW and EDG loss of power timers was to provide a more appropriate requirement in consideration of the plant design. The timer function supports the actuation of the loss of power start of the AFW pumps and EDGs and load shed initiation. The function is provided by both trains of power and the voltage sensors for each train are arranged in a two-out-of-three logic scheme. Using redundant timers in each train of this function after the detection of low voltage provided a conservative design but was in excess of the required design for mitigation features. Therefore, the timers should not have to meet the single failure requirements in the TSs and only one timer is required to satisfy the loss of power start function. The associated actions (CTS ACTIONs 34 and 35) were modified to provide the appropriate wording for the change. Supplemental letters were sent on April 11, 2005 (ADAMS Accession Number ML051190262), and July 11, 2006 (ADAMS Accession Number ML061990303). By letter dated September 13, 2006, the Commission issued Amendments 310 and 299 for SQN, Units 1 and 2, respectively. The Safety Evaluation related to Amendments 310 and 299 acknowledged that, “The licensee has proposed to reduce the Minimum Channels Operable from 2 per shutdown board to only 1 per shutdown board. Since there is no NRC requirement for the licensee to have redundant timers, the staff finds the proposed change acceptable.”** **Attachment 1 is the Commission’s issuance of Amendments 310 and 299 for SQN, Units 1 and 2.**
Response Date/Time	**8/19/2014 1:20 PM**
Closure	

Statement	
Question Closure Date	
Notification	**Scott Bowman** **Kristy Bucholtz** **Michelle Conner** **Khadijah Hemphill** **Andrew Hon** **Ray Schiele**
Added By	**Scott Bowman**
Date Added	**8/19/2014 12:15 PM**
Date Modified	
Modified By	

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 13, 2006

Mr. Karl W. Singer
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT REGARDING NOMINAL TRIP SETPOINTS FOR REACTOR PROTECTION SYSTEM AND ENGINEERED SAFETY FEATURES INSTRUMENTATION (TAC NOs. MC4408 AND MC4409) (TS-02-01)

Dear Mr. Singer:

The Commission has issued the enclosed Amendment No. 310 to Facility Operating License No. DPR-77 and Amendment No. 299 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2. These amendments are in response to your application dated August 18, 2004, as supplemented by letters dated April 11, 2005, and July 11, 2006 (TS-02-01).

The amendments revise Technical Specifications (TSs) relating to the reactor protection system and engineered safety features instrumentation. The Trip Setpoint column of TS Tables 2.2-1 and 3.3-4 will be renamed Nominal Trip Setpoint; inequality signs in TS Tables 2.2-1 and 3.3-4 will be removed; the trip setpoint and allowable value for the Intermediate Range Neutron Flux P-6 permissive will be revised; Minimum Channels Operable in TS Table 3.3-3 will be revised; editorial changes will be made to TS Table 3.3-4 to replace ± signs with inequalities; and a correction will be made to an alarm/trip setpoint in TS Table 3.3-6.

A copy of the safety evaluation is also enclosed. Notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Douglas V Pickett

Douglas V. Pickett, Senior Project Manager
Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-327 and 50-328

Enclosures:
1. Amendment No. 310 to License No. DPR-77
2. Amendment No. 299 to License No. DPR-79
3. Safety Evaluation

cc:
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Mr. Paul L. Pace, Manager
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Mr. David A. Kulisek, Plant Manager
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Mr. Lawrence E. Nanney, Director
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Ms. Ann P. Harris
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Rockwood, Tennessee 37854

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.310
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Tennessee Valley Authority (the licensee) dated August 18, 2004, as supplemented on April 11, 2005, and July 11, 2006, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-77 is hereby amended to read as follows:

    (2) Technical Specifications and Environmental Protection Plan

    The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 310 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 45 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer Dixon-Herrity, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Change to the Technical Specifications

Date of Issuance: September 13, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 310

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Replace page 3 of Operating License No. DPR-77 with the attached page 3.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
2-4	2-4
2-5	2-5
2-6	2-6
2-6a	2-6a
2-7	2-7
2-8	2-8
2-9	2-9
2-10	2-10
3/4 3-14	3/4 3-14
3/4 3-20	3/4 3-20
3/4 3-21	3/4 3-21
3/4 3-23	3/4 3-23
3/4 3-23a	3/4 3-23a
3/4 3-24	3/4 3-24
3/4 3-25	3/4 3-25
3/4 3-26	3/4 3-26
3/4 3-27	3/4 3-27
3/4 3-27a	3/4 3-27a
3/4 3-27b	3/4 3-27b
3/4 3-28	3/4 3-28
3/4 3-40	3/4 3-40

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required, any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis, instrument calibration or associated with radioactive apparatus or components; and

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the Sequoyah and Watts Bar Unit 1 Nuclear Plants.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:

a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

b. Modification of test objectives, methods or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

c. Performance of any test at power level different from there described; and

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The reactor trip system instrumentation and interlocks setpoints shall be set consistent with the Nominal Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

With a reactor trip system instrumentation or interlock setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Power Range Neutron Flux	Low Setpoint - 25% of RATED THERMAL POWER	Low Setpoint - ≤ 27.4% of RATED THERMAL POWER
	High Setpoint - 109% of RATED THERMAL POWER	High Setpoint - ≤ 111.4% of RATED THERMAL POWER
3. Power Range Neutron Flux High Positive Rate	5% of RATED THERMAL POWER with a time constant ≥ 2 second	≤ 6.3% of RATED THERMAL POWER with a time constant ≥ 2 second
4. Power Range Neutron Flux, High Negative Rate	5% of RATED THERMAL POWER with a time constant ≥ 2 second	≤ 6.3% of RATED THERMAL POWER with a time constant ≥ 2 second
5. Intermediate Range, Neutron Flux	25% of RATED THERMAL POWER	≤ 45.20% of RATED THERMAL POWER
6. Source Range Neutron Flux	10^5 counts per second	≤ 1.45×10^5 counts per second
7. Overtemperature ΔT	See Note 1	See Note 3
8. Overpower ΔT	See Note 2	See Note 4
9. Pressurizer Pressure--Low	1970 psig	≥ 1964.8 psig
10. Pressurizer Pressure--High	2385 psig	≤ 2390.2 psig
11. Pressurizer Water Level—High	92% of instrument span	≤ 92.7% of instrument span
12. Loss of Flow	90% of design flow per loop*	≥ 89.6% of design flow per loop*

*Design flow is 90,045 (87,000 X 1.035) gpm per loop.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
13. Steam Generator Water Level--Low-Low		
a. RCS Loops ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input ≤ nominal trip setpoint + 2.5% RTP
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5)	≤ (1.01) T_S (Note 5)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5)	≤ (1.01) T_M (Note 5)
b. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
14. Deleted		
15. Undervoltage-Reactor Coolant Pumps	5022 volts-each bus	≥ 4739 volts-each bus
16. Underfrequency-Reactor Coolant Pumps	56.0 Hz - each bus	≥ 55.9 Hz - each bus
17. Turbine Trip		
A. Low Trip System Pressure	45 psig	≥ 43 psig *
B. Turbine Stop Valve Closure	1% open	≥ 1% open
18. Safety Injection Input from ESF	Not Applicable	Not Applicable
19. Intermediate Range Neutron Flux - (P-6) Enable Block Source Range Reactor Trip	1×10^{-4}% of RATED THERMAL POWER	≥ 6×10^{-5}% of RATED THERMAL POWER
20. Power Range Neutron Flux (not P-10) Input to Low Power Reactor Trips Block P-7	10% of RATED THERMAL POWER	≤ 12.4% of RATED THERMAL POWER

* The allowable value for the Turbine Trip – Low Trip System Pressure is ≥ 39.5 psig and expires at the end of the Unit 1 Cycle 15 Operating Cycle.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
21. Turbine Impulse Chamber Pressure - (P-13) Input to Low Power Reactor Trips Block P-7	10% Turbine Impulse Pressure Equivalent	≤ 12.4% Turbine Impulse Pressure Equivalent
22. Power Range Neutron Flux - (P-8) Low Reactor Coolant Loop Flow, and Reactor Trip	35% of RATED THERMAL POWER	≤ 37.4% of RATED THERMAL POWER
23. Power Range Neutron Flux - (P-10) - Enable Block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips	10% of RATED THERMAL POWER	≥ 7.6% of RATED THERMAL POWER
24. Reactor Trip P-4	Not Applicable	Not Applicable
25. Power Range Neutron Flux - (P-9) - Blocks Reactor Trip for Turbine Trip Below 50% Rated Power	50% of RATED THERMAL POWER	≤ 52.4% of RATED THERMAL POWER

NOTATION

NOTE 1:

$$\text{Overtemperature } \Delta T \left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0 \left\{K_1 - K_2\left(\frac{1+\tau_1 S}{1+\tau_2 S}\right)[T - T'] + K_3(P - P') - f_1(\Delta I)\right\}$$

Where:

$\frac{1+\tau_4 S}{1+\tau_5 S}$ = Lead-lag compensator on measured ΔT

τ_4, τ_5 = Time constants utilized in the lead-lag controller for ΔT, $\tau_4 \geq 5$ secs, $\tau_5 \leq 3$ sec.

ΔT_0 = Indicated ΔT at RATED THERMAL POWER

K_1 ≤ 1.15

K_2 ≥ 0.011

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

NOTE 1: (Continued)

$\frac{1 + \tau_1 S}{1 + \tau_2 S}$	=	The function generated by the lead-lag controller for T_{avg} dynamic compensation
τ_1, & τ_2	=	Time constants utilized in the lead-lag controller for T_{avg}, $\tau_1 \geq 33$ secs., $\tau_2 \leq 4$ secs.
T	=	Average temperature °F
T'	$\leq$	578.2°F (T_{avg} at RATED THERMAL POWER)
K_3	=	0.00055
P	=	Pressurizer pressure, psig
P'	=	2235 psig (Nominal RCS operating pressure)
S	=	Laplace transform operator (sec^{-1})

and $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for $q_t - q_b$ between QTNL* and QTPL* $f_1(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

NOTE 1: (Continued)

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QTPL*, the ΔT nominal trip setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

NOTE 2: Overpower $$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6\ (T - T'') - f_2\ (\Delta I)\right\}$$

Where:

$\frac{1+\tau_4 S}{1+\tau_5 S}$	=	as defined in Note 1
τ_4, τ_5	=	as defined in Note 1
ΔT_0	=	as defined in Note 1
K_4	$\leq$	1.087
K_5	$\geq$	0.02/°F for increasing average temperature and 0 for decreasing average temperature
$\frac{\tau_3 S}{1 + \tau_3 S}$	=	The function generated by the rate-lag controller for T_{avg} dynamic compensation

* QTNL, QTPL, QTNS, and QTPS are specified in the COLR per Specification 6.9.1.14.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS
NOTATION (Continued)

NOTE 2: (Continued)

τ_3	=	Time constant utilized in the rate-lag controller for T_{avg}, $\tau_3 \geq 10$ secs.
K_6	$\geq$	0.0011 for T > T" and $K_6 \geq 0$ for T $\leq$ T"
T	=	as defined in Note 1
T"	=	Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, $\leq 578.2°F$)
S	=	as defined in Note 1

and $f_2(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for $q_t - q_b$ between QPNL* and QPPL* $f_2(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPNL* the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPPL* the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

NOTE 3: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.9 percent ΔT span.

NOTE 4: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.7 percent ΔT span.

*QPNL, QPPL, QPNS, and QPPS are specified in the COLR per Specification 6.9.1.14.

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
e. Loss of Power Start					
1. Voltage Sensors	3/shutdown board**	2/shutdown board**	3/shutdown board**	1, 2, 3	35
2. Load Shed Timer	2/shutdown board**	1/shutdown board**	1/shutdown board**	1, 2, 3	35
f. Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump	1/pump	1/pump	1/pump	1, 2	20
g. Auxiliary Feedwater Suction Pressure- Low	3/pump	2/pump	3/pump	1, 2, 3	21
h. Auxiliary Feedwater Suction Transfer Time Delays					
1. Motor-Driven Pump	1/pump	1/pump	1/pump	1, 2, 3	21
2. Turbine-Driven Pump	2/pump	1/pump	2/pump	1, 2, 3	21

**Unit 1 shutdown boards only

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. LOSS OF POWER					
a. 6.9 kv Shutdown Board -- Loss of Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	3/shutdown board	1, 2, 3, 4 5####, 6####	34
2. Diesel Generator Start and Load Shed Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4 5####, 6####	34
b. 6.9 kv Shutdown Board Degraded Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	3/shutdown board	1, 2, 3, 4 5####, 6####	34
2. Diesel Generator Start and Load Shed Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4 5####, 6####	34
3. SI/Degraded Voltage Logic Enable Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	34
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS					
a. Pressurizer Pressure-P-11/Not P-11	3	2	2	1, 2, 3	22a
b. Deleted					
c. Steam Generator Level P-14	3/loop	2/loop any loop	3/loop	1, 2	22c

TABLE 3.3-3 (Continued)

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, declare the associated auxiliary feedwater pump inoperable, and comply with the ACTION requirements of Specification 3.7.1.2.

ACTION 22 - With less than the Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions. Functions to be evaluated are:

a. Safety Injection
   Pressurizer Pressure
   Steam Line Pressure
   Negative Steam Line Pressure Rate

b. Deleted

c. Turbine Trip
   Steam Generator Level High-High
   Feedwater Isolation
   Steam Generator Level High-High

ACTION 23 - With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.1.

ACTION 24 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

ACTION 25 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 34 -

a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated diesel generator set made inoperable by the channel.

b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated diesel generator set made inoperable by the channels.

TABLE 3.3-3 (Continued)

ACTION 35 - a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channel.

b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channels.

ACTION 36 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. For the affected protection set, the Trip Time Delay for one affected steam generator (T_S) is adjusted to match the Trip Time Delay for multiple affected steam generators (T_M) within 4 hours.

c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

ACTION 38 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION, TURBINE TRIP AND FEEDWATER ISOLATION		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure—High	1.54 psig	≤ 1.6 psig
d. Pressurizer Pressure--Low	1870 psig	≥ 1864.8 psig
e. Deleted		
f. Steam Line Pressure—Low	600 psig steam line pressure (Note 1)	≥ 592.2 psig steam line pressure (Note 1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
2. CONTAINMENT SPRAY		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
3. CONTAINMENT ISOLATION		
a. Phase "A" Isolation		
1. Manual	Not Applicable	Not Applicable
2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable
b. Phase "B" Isolation		
1. Manua1	Not Applicable	Not Applicable
2. Automatic Actuation Logic	Not Applicable	Not Applicable
3. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
c. Containment Ventilation Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Isolation Logic	Not Applicable	Not Applicable

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
3. Containment Purge Air Exhaust Monitor Radioactivity-High	$\leq 8.5 \times 10^{-3}$ μCi/cc	$\leq 8.5 \times 10^{-3}$ μCi/cc
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤ 2.9 psig
d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥ 592.2 psig steam line pressure (Note 1)
e. Negative Steam Line Pressure Rate—High	100.0 psi (Note 2)	≤ 107.8 psi (Note 2)
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water level-- High-High	81% of narrow range instrument span each steam generator	≤ 81.7% of narrow range instrument span each steam generator
b. Automatic Actuation Logic	N.A.	N.A.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
6. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Main Steam Generator Water Level--Low-Low		
i. RCS Loop ΔT Equivalent to Power $\leq$ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input $\leq$ nominal trip setpoint +2.5% RTP
Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	$\geq$14.4% of narrow range instrument span
and		
Containment Pressure-EAM	0.5 psig	$\leq$ 0.6 psig
or		
Steam Generator Water Level--Low-Low (EAM)	10.7% of narrow range instrument span	$\geq$ 10.1% of narrow instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5, Table 2.2-1)	$\leq$ (1.01) T_S (Note 5, Table 2.2-1)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5, Table 2.2-1)	$\leq$ (1.01) T_M (Note 5, Table 2.2-1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level-- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument span
d. S.I.	See 1 above (all SI Setpoints)	
e. Loss of Power Start		
1. Voltage Sensors	5520 volts	≥ 5331 volts
2. Load Shed Timer	1.25 seconds	≥ 1.00 second and ≤ 1.50 seconds
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	3.21 psig (motor driven pump)	≥ 2.44 psig (motor driven pump)
	13.9 psig (turbine driven (pump)	≥ 12 psig (turbine driven pump)
h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	≤ 4.4 seconds and ≥ 3.6 seconds (motor driven pump)
	5.5 seconds (turbine driven pump)	≤ 6.05 seconds and ≥ 4.95 seconds (turbine driven pump)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Undervoltage		
Loss of Voltage		
1. Voltage Sensors	5520 volts	≥ 5331 volts
2. Diesel Generator Start and Load Shed Timer	1.25 seconds	≥ 1.00 second and ≤ 1.50 seconds
b. 6.9 kv Shutdown Board-Degraded Voltage		
1. Voltage Sensors	6456 volts	≥ 6403.5 volts (dropout) ≤ 6595.5 volts (reset)
2. Diesel Generator Start and Load Shed Timer	300 seconds	≤ 370 seconds
3. SI/Degraded Voltage Logic Enable Timer	9.5 seconds	≥ 7.5 seconds and ≤ 11.5 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure		
1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1970 psig	≤ 1975.2 psig
2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1962 psig	≥ 1956.8 psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS (Continued)		
b. Deleted		
c. Deleted		
d. Steam Generator Level Turbine Trip, Feedwater Isolation P-14	(See 5. above)	
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP		
a. RWST Level - Low	130" from tank base	≤ 132.71" and ≥ 127.29" from tank base
COINCIDENT WITH		
Containment Sump Level - High	30" above elev. 680'	≤ 31.68" and ≥ 28.32" above elev. 680'
AND		
Safety Injection	(See 1 above for all Safety Injection Setpoints/Allowable Values)	
b. Automatic Actuation Logic	N.A.	N.A.

Note 1: Time constants utilized in the lead-lag controller for Steam Pressure - Low are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.

Note 2: Time constant utilized in the rate-lag controller for Negative Steam Line Pressure Rate - High is $\tau \geq 50$ seconds.

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITOR					
a. Fuel Storage Pool Area	1	*	≤ 151 mR/hr	10^{-1} - 10^{4} mR/hr	26
2. PROCESS MONITORS					
a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤ 8.5x 10^{-3} μCi/cc	10 - 10^{7} cpm	28
b. Containment					
i. Gaseous Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29

* With fuel in the storage pool or building

** Equivalent to 1.0 x 10^{-5} μCi/cc.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 299
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Tennessee Valley Authority (the licensee) dated August 18, 2004, as supplemented on April 11, 2005, and July 11, 2006, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

   (2) <u>Technical Specifications and Environmental Protection Plan</u>

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 299, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 45 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Jennifer Dixon-Herrity

Jennifer Dixon-Herrity, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Change to the Technical Specifications

Date of Issuance: September 13, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 299

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Replace page 3 of Operating License No. DPR-79 with the attached page 3.

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages is identified by amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
2-4	2-4
2-5	2-5
2-6	2-6
2-7	2-7
2-8	2-8
2-9	2-9
2-10	2-10
2-11	2-11
2-12	2-12
3/4 3-14	3/4 3-14
3/4 3-20	3/4 3-20
3/4 3-21	3/4 3-21
3/4 3-23	3/4 3-23
3/4 3-23a	3/4 3-23a
3/4 3-24	3/4 3-24
3/4 3-25	3/4 3-25
3/4 3-26	3/4 3-26
3/4 3-27	3/4 3-27
3/4 3-27a	3/4 3-27a
3/4 3-27b	3/4 3-27b
3/4 3-28	3/4 3-28
3/4 3-41	3/4 3-41

(4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the Sequoyah and Watts Bar Unit 1 Nuclear Plants.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The Tennessee Valley Authority is authorized to operate the facility at reactor core power levels not in excess of 3455 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Initial Test Program

The Tennessee Valley Authority shall conduct the post-fuel-loading initial test program (set forth in Section 14 of Tennessee Valley Authority's Final Safety Analysis Report, as amended), without making any major modifications of this program unless modifications have been identified and have received prior NRC approval. Major modifications are defined as:

a. Elimination of any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

b. Modification of test objectives, methods or acceptance criteria for any test identified in Section 14 of TVA's Final Safety Analysis Report as amended as being essential;

c. Performance of any test at power level different from there described; and

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The reactor trip system instrumentation and interlocks setpoints shall be set consistent with the Nominal Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

With a reactor trip system instrumentation or interlock setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Power Range, Neutron Flux	Low Setpoint - 25% of RATED THERMAL POWER	Low Setpoint - ≤ 27.4% of RATED THERMAL POWER
	High Setpoint - 109% of RATED THERMAL POWER	High Setpoint - ≤ 111.4% of RATED THERMAL POWER
3. Power Range, Neutron Flux, High Positive Rate	5% of RATED THERMAL POWER with a time constant ≥2 seconds	≤ 6.3% of RATED THERMAL POWER with a time constant ≥2 seconds
4. Power Range, Neutron Flux, High Negative Rate	5% of RATED THERMAL POWER with a time constant ≥2 seconds	≤ 6.3% of RATED THERMAL POWER with a time constant ≥2 seconds
5. Intermediate Range, Neutron Flux	25% of RATED THERMAL POWER	≤ 45.20% of RATED THERMAL POWER
6. Source Range, Neutron Flux	10^5 counts per second	≤ 1.45 x 10^5 counts per second
7. Overtemperature ΔT	See Note 1	See Note 3
8. Overpower ΔT	See Note 2	See Note 4
9. Pressurizer Pressure--Low	1970 psig	≥ 1964.8 psig
10. Pressurizer Pressure--High	2385 psig	≤ 2390.2 psig
11. Pressurizer Water Level--High	92% of instrument span	≤ 92.7% of instrument span
12. Loss of Flow	90% of design flow per loop*	≥ 89.6% of design flow per loop*

*Design flow is 90,045 (87,000 x 1.035) gpm per loop.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
13. Steam Generator Water Level--Low-Low		
a. RCS Loops ΔT Equivalent to Power $\leq$ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input $\leq$ nominal trip setpoint + 2.5% RTP
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	$\geq$ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	$\leq$ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	$\geq$ 10.1% of narrow range instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5)	$\leq$ (1.01) T_S (Note 5)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5)	$\leq$ (1.01) T_M (Note 5)

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
b. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with		
Steam Generator Water Level -- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level -- Low-Low (EAM)	10.7% of narrow range instrument span	≥ 10.1% of narrow range instrument
14. Deleted		
15. Undervoltage-Reactor Coolant Pumps	5022 volts-each bus	≥ 4739 volts - each bus
16. Underfrequency-Reactor Coolant Pumps	56.0 Hz - each bus	≥ 55.9 Hz - each bus
17. Turbine Trip		
A. Low Trip System Pressure	≥ 45 psig	≥ 43 psig *
B. Turbine Stop Valve Closure	1% open	> 1% open
18. Safety Injection Input from ESF	Not Applicable	Not Applicable

* The allowable value for the Turbine Trip – Low Trip System Pressure is ≥ 39.5 psig and expires at the end of the Unit 2 Cycle 15 Operating Cycle.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
19. Intermediate Range Neutron Flux, P-6, Enable Block Source Range Reactor Trip	1×10^{-4} % of RATED THERMAL POWER	$\geq 6 \times 10^{-5}$ % of RATED THERMAL POWER
20. Power Range Neutron Flux (not P-10) Input to Low Power Reactor Trips Block P-7	10% of RATED THERMAL POWER	≤ 12.4% of RATED THERMAL POWER
21. Turbine Impulse Chamber Pressure -(P-13) Input to Low Power Reactor Trips Block P-7	10% Turbine Impulse Pressure Equivalent	≤ 12.4% Turbine Impulse Pressure Equivalent
22. Power Range Neutron Flux - (P-8) Low Reactor Coolant Loop Flow, and Reactor Trip	35% of RATED THERMAL POWER	≤ 37.4% of RATED THERMAL POWER
23. Power Range Neutron Flux - (P-I0) - Enable block of Source, Intermediate, and Power Range (low setpoint) Reactor Trips	10% of RATED THERMAL POWER	≥ 7.6% of RATED THERMAL POWER
24. Reactor Trip P-4	Not Applicable	Not Applicable
25. Power Range Neutron Flux - (P-9) Blocks Reactor Trip for Turbine - Trip Below 50% Rated Power	50% of RATED THERMAL POWER	≤ 52.4% of RATED THERMAL POWER

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION

NOTE 1:

$$\text{Overtemperature } \Delta T \left(\frac{1 + \tau_4 S}{1 + \tau_5 S}\right) \leq \Delta T_0 \left\{K_1 - K_2 \left(\frac{1 + \tau_1 S}{1 + \tau_2 S}\right)[T - T'] + K_3 (P - P') - f_1(\Delta I)\right\}$$

Where:

$\frac{1 + \tau_4 S}{1 + \tau_5 S}$	=	Lead-lag compensator on measured ΔT
τ_4, τ_5	=	Time constants utilized in the lead-lag controller for ΔT, $\tau_4 \geq 5$ secs, $\tau_5 \leq 3$ sec.
ΔT_0	=	Indicated ΔT at RATED THERMAL POWER
K_1	$\leq$	1.15
K_2	$\geq$	0.011
$\frac{1 + \tau_1 S}{1 + \tau_2 S}$	=	The function generated by the lead-lag controller for T_{avg} dynamic compensation
τ_1, & τ_2	=	Time constants utilized in the lead-lag controller for T_{avg}, $\tau_1 \geq 33$ secs., $\tau_2 \leq 4$ secs.
T	=	Average temperature °F
T'	$\leq$	578.2°F (T_{avg} at RATED THERMAL POWER)
K_3	=	0.00055
P	=	Pressurizer pressure, psig
P'	=	2235 psig (Nominal RCS operating pressure)

NOTATION (Continued)

NOTE 1: (Continued)

S = Laplace transform operator (sec^{-1})

and $f_1(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for q_t - q_b between QTNL* and QTPL* $f_1(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of (q_t - q_b) exceeds QTNL*, the ΔT nominal trip setpoint shall be automatically reduced by QTNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of (q_t - q_b) exceeds QTPL*, the ΔT nominal trip
setpoint shall be automatically reduced by QTPS* of its value at RATED THERMAL POWER.

NOTE 2: Overpower $\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_0 \left\{K_4 - K_5\left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 \left(T - T''\right) - f_2\left(\Delta I\right)\right\}$

Where: $\frac{1+\tau_4 S}{1+\tau_5 S}$ = as defined in Note 1

* QTNL, QTPL, QTNS, and QTPS are specified in the COLR per Specification 6.9.1.14.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

NOTE 2: (Continued)

τ_4, τ_5	=	as defined in Note 1
ΔT_0	=	as defined in Note 1
K_4	≤	1.087
K_5	≥	0.02/°F for increasing average temperature and 0 for decreasing average temperature
$\frac{\tau_3 S}{1 + \tau_3 S}$	=	The function generated by the rate-lag controller for T_{avg} dynamic compensation
τ_3	=	Time constant utilized in the rate-lag controller for T_{avg}, $\tau_3 \geq$ 10 secs.
K_6	≥	0.0011 for $T > T''$ and $K_6 \geq 0$ for $T \leq T''$
T	=	as defined in Note 1
T"	=	Indicated T_{avg} at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ 578.2°F)
S	=	as defined in Note 1

and $f_2(\Delta I)$ is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that:

(i) for $q_t - q_b$ between QPNL* and QPPL* $f_2(\Delta I) = 0$ (where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER).

(ii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPNL* the ΔT nominal trip setpoint shall be automatically reduced by QPNS* of its value at RATED THERMAL POWER.

(iii) for each percent that the magnitude of $(q_t - q_b)$ exceeds QPPL* the ΔT nominal trip setpoint shall be automatically reduced by QPPS* of its value at RATED THERMAL POWER.

*QPNL, QPPL, QPNS, and QPPS are specified in the COLR per Specification 6.9.1.14.

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

NOTATION (Continued)

NOTE 3: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.9 percent ΔT span.

NOTE 4: The channel's maximum trip setpoint shall not exceed its computed nominal trip setpoint by more than 1.7 percent ΔT span.

NOTE 5: Trip Time Delay - Steam Generator Water Level--Low-Low

$$T_s = \{(-0.00583)(P)^3 + (0.735)(P)^2 - (33.560)(P) + 649.5\}\{0.99\} \text{ secs.}$$

$$T_m = \{(-0.00532)(P)^3 + (0.678)(P)^2 - (31.340)(P) + 589.5\}\{0.99\} \text{ secs.}$$

Where:

P = RCS Loop ΔT Equivalent to Power (% RTP), $P \le 50\%$ RTP

T_s = Time delay for Steam Generator Water Level--Low-Low Reactor Trip, one Steam Generator affected (secs).

T_m = Time delay for Steam Generator Water Level--Low-Low Reactor Trip, two or more Steam Generators affected (secs).

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Nominal Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Nominal Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
e. Loss of Power Start					
1. Voltage Sensors	3/shutdown board**	2/shutdown board**	3/shutdown board**	1, 2, 3	35
2. Load Shed Timer	2/shutdown board**	1/shutdown board**	1/shutdown board**	1, 2, 3	35
f. Trip of Main Feedwater Pumps Start Motor-Driven Pumps and Turbine Driven Pump	1/pump	1/pump	1/pump	1, 2	20
g. Auxiliary Feedwater Suction Pressure-Low	3/pump	2/pump	3/pump	1, 2, 3	21
h. Auxiliary Feedwater Suction Transfer Time Delays					
1. Motor-Driven Pump	1/pump	1/pump	1/pump	1, 2, 3	21
2. Turbine-Driven Pump	2/pump	1/pump	2/pump	1, 2, 3	21

** Unit 2 Shutdown Boards Only

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. LOSS OF POWER					
a. 6.9 kv Shutdown Board –Loss of Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	3/shutdown board	1, 2, 3, 4, 5####, 6####	34
2. Diesel Generator Start and Load Shed Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4, 5####, 6####	34
b. 6.9 kv Shutdown Board Degraded Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	3/shutdown board	1, 2, 3, 4, 5####, 6####	34
2. Diesel Generator Start and Load Shed Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4, 5####, 6####	34
3. SI/Degraded Voltage Logic Enable Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	34

TABLE 3.3-3 (Continued)

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, declare the associated auxiliary feedwater pump inoperable, and comply with the ACTION requirements of Specification 3.7.1.2.

ACTION 22 - With less than the Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions. Functions to be evaluated are:

a. Safety Injection
   Pressurizer Pressure
   Steam Line Pressure
   Negative Steam Line Pressure Rate

b. Deleted

c. Turbine Trip
   Steam Generator Level High-High
   Feedwater Isolation
   Steam Generator Level High-High

ACTION 23 - With the number of OPERABLE channels one less than the Total Number of Channels, be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.1.

ACTION 24 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

ACTION 25 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 34 -

a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated diesel generator set made inoperable by the channel.

b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated diesel generator set made inoperable by the channels.

ACTION 35 - a. With the number of OPERABLE channels one less than the Total Number of Channels for voltage sensors, restore the inoperable channel to OPERABLE status within 6 hours or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channel.

b. With the number of OPERABLE channels less than the Total Number of Channels by more than one for voltage sensors or timers, restore all but one channel to OPERABLE status within 1 hour or enter applicable Limiting Condition(s) For Operation and Action(s) for the associated auxiliary feedwater pump made inoperable by the channels.

ACTION 36 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. For the affected protection set, the Trip Time Delay for one affected steam generator (TS) is adjusted to match the Trip Time Delay for multiple affected steam generators (TM) within 4 hours.

c. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.1.

ACTION 37 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delays (T_S and T_M) threshold power level for zero seconds time delay is adjusted to 0% RTP.

ACTION 38 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Steam Generator Water Level - Low-Low (EAM) channels trip setpoint is adjusted to the same value as Steam Generator Water Level - Low-Low (Adverse).

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION, TURBINE TRIP AND FEEDWATER ISOLATION		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High	1.54 psig	≤1.6 psig
d. Pressurizer Pressure--Low	1870 psig	≥1864.8 psig
e. Deleted		
f. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥592.2 psig steam line pressure (Note 1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
2. CONTAINMENT SPRAY		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤2.9 psig
3. CONTAINMENT ISOLATION		
a. Phase "A" Isolation		
1. Manua1	Not Applicable	Not Applicable
2. From Safety Injection Automatic Actuation logic	Not Applicable	Not Applicable
b. Phase "B" Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Actuation Logic	Not Applicable	Not Applicable
3. Containment Pressure--High-High	2.81 psig	≤2.9 psig
c. Containment Ventilation Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Isolation Logic	Not Applicable	Not Applicable

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
3. Containment Purge Air Exhaust Monitor Radioactivity - High	$\leq 8.5 \times 10^{-3}$ µCi/cc	$\leq 8.5 \times 10^{-3}$ µCi/cc
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	2.81 psig	≤2.9 psig
d. Steam Line Pressure--Low	600 psig steam line pressure (Note 1)	≥592.2 psig steam line pressure (Note 1)
e. Negative Steam Line Pressure Rate--High	100.0 psi (Note 2)	≤107.8 psi (Note 2)
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Steam Generator Water level -- High-High	81% of narrow range instrument span each steam generator	≤81.7% of narrow range instrument span each steam generator
b. Automatic Actuation Logic	N.A.	N.A.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
6. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Main Steam Generator Water Level--Low-Low		
i. RCS Loop ΔT Equivalent to Power $\leq$ 50% RTP	RCS Loop ΔT variable input 50% RTP	RCS Loop ΔT variable input $\leq$ nominal trip setpoint +2.5% RTP
Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	$\geq$14.4% of narrow range instrument span
and		
Containment Pressure-EAM	0.5 psig	$\leq$ 0.6 psig
or		
Steam Generator Water Level--Low-Low (EAM)	10.7% of narrow range instrument span	$\geq$ 10.1% of narrow instrument span
with		
A time delay (T_S) if one Steam Generator is affected	T_S (Note 5, Table 2.2-1)	$\leq$ (1.01) T_S (Note 5, Table 2.2-1)
or		
A time delay (T_M) if two or more Steam Generators are affected	T_M (Note 5, Table 2.2-1)	$\leq$ (1.01) T_M (Note 5, Table 2.2-1)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with Steam Generator Water Level-- Low-Low (Adverse)	15.0% of narrow range instrument span	≥ 14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	0.5 psig	≤ 0.6 psig
or		
Steam Generator Water Level-- Low-Low (EAM)	10.7% of narrow range instrument span	≥10.1% of narrow range instrument span
d. S.I.	See 1 above (all SI Setpoints)	
e. Loss of Power Start		
1. Voltage Sensors	5520 volts	≥ 5331 volts
2. Load Shed Timer	1.25 seconds	≥ 1.00 second and ≤ 1.50 seconds
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	3.21 psig (motor driven pump)	≥ 2.44 psig (motor driven pump)
	13.9 psig (turbine driven (pump)	≥ 12 psig (turbine driven pump)
h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	≤ 4.4 seconds and ≥ 3.6 seconds (motor driven pump)
	5.5 seconds (turbine driven pump)	≤ 6.05 seconds and ≥ 4.95 seconds (turbine driven pump)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Undervoltage Loss of Voltage		
1. Voltage Sensors	5520 volts	≥ 5331 volts
2. Diesel Generator Start and Load Shed Timer	1.25 seconds	≥1.00 second and ≤1.50 seconds
b. 6.9 kv Shutdown Board-Degraded Voltage		
1. Voltage Sensors	6456 volts	≥ 6403.5 volts (dropout) ≤ 6595.5 volts (reset)
2. Diesel Generator Start and Load Shed Timer	300 seconds	≤ 370 seconds
3. SI/Degraded Voltage Logic Enable Timer	9.5 seconds	≥ 7.5 seconds and ≤ 11.5 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure		
1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	1970 psig	≤1975.2 psig
2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	1962 psig	≥1956.8 psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	NOMINAL TRIP SETPOINT	ALLOWABLE VALUES
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS (Continued)		
b. Deleted		
c. Deleted		
d. Steam Generator Level Turbine Trip, Feedwater Isolation P-14	(See 5. above)	
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP		
a. RWST Level - Low	130" from tank base	≤ 132.71" and ≥ 127.29" from tank base
COINCIDENT WITH		
Containment Sump Level - High	30" above elev. 680'	≤ 31.68" and ≥ 28.32" above elev. 680'
AND		
Safety Injection	(See 1 above for all Safety Injection Setpoints/Allowable Valves)	
b. Automatic Actuation Logic	N.A.	N.A.

Note 1: Time constants utilized in the lead-lag controller for Steam Pressure-Low are $\tau_1 \geq 50$ seconds and $\tau_2 \leq 5$ seconds.

Note 2: Time constant utilized in the rate-lag controller for Negative Steam Line Pressure Rate-High is $\tau_1 \geq 50$ seconds.

TABLE 3.3-6
RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITOR					
a. Fuel Storage Pool Area	1	*	≤151 mR/hr	10^{-1} - 10^{4} mR/hr	26
2. PROCESS MONITORS					
a. Containment Purge Air	1	1, 2, 3, 4 & 6	≤8.5 x 10^{-3} µCi/cc	10 - 10^{7} cpm	28
b. Containment					
i. Gaseous Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
ii. Particulate Activity					
RCS Leakage Detection	1	1, 2, 3 & 4	N/A	10 - 10^{7} cpm	27
c. Control Room Isolation	2	ALL MODES and during movement of irradiated fuel assemblies	≤ 400 cpm**	10 - 10^{7} cpm	29

* With fuel in the storage pool or building

** Equivalent to 1.0 x 10^{-5} µCi/cc.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 310 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 299 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By application dated August 18, 2004 (Agencywide Documents Access and Management System (ADAMS) No. ML042430467), as supplemented on April 11, 2005 (ADAMS No. ML051190262), and July 11, 2006, (ADAMS No. ML061990303), Tennessee Valley Authority (TVA, the licensee) requested changes to the Technical Specifications (TSs) for the Sequoyah Nuclear Plant (SQN) Units 1 and 2.

The requested changes provide a revision to the SQN TSs relating to the reactor protection system and engineered safety features (ESF) instrumentation. Specifically, the proposed changes include the following:

(1) The "Trip Setpoint" column of TS Tables 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," and TS Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Setpoints," will be renamed to "Nominal Trip Setpoint."

(2) The inequality signs of TS Tables 2.2-1 and 3.3-4 will be removed.

(3) Other TSs that currently use the term Trip Setpoint will be changed to Nominal Trip Setpoint. This includes TS 2.2, "Limiting Safety System Settings," TS Table 2.2-1, Functional Unit 13, "Steam Generator Water Level - Low-Low," along with Notes 1, 2, 3, and 4, TS 3/4.3.2, "Engineered Safety Feature Actuation System Instrumentation," and TS Table 3.3-4, Functional Unit 6.c, "Main Steam Generator Water Level - Low-Low."

(4) The term "nominal" will be removed from the average temperature at rated thermal power (T') definition in TS Table 2.2-1, Note 1.

(5) Allowable values (AVs) in TS Table 3.3-4 that are currently represented with a numerical value and a tolerance expressed with a ± sign are revised to utilize an inequality that retains the existing limits.

(6) The nominal trip setpoint and allowable value for the intermediate range neutron flux P-6 permissive in TS Table 2.2-1 will be revised.

(7) The fuel storage pool area monitor alarm/trip setpoint in TS Table 3.3-6, "Radiation Monitoring Instrumentation," has been revised to correct a previous error.

(8) The required minimum channels operable for the auxiliary feedwater (AFW) Load Shed Timers and the emergency diesel generator (EDG) Start and Load Shed Timers and Safety Injection(SI)/Degraded Voltage Logic Enable Timers in TS Table 3.3-3, "Engineered Safety Feature Actuation System Instrumentation," have been revised from 2 per shutdown board to 1 per shutdown board. Actions 34 and 35 of TS Table 3.3-3 are appropriately modified to reflect these revisions.

Notice of these amendments was given in the *Federal Register* on October 12, 2004 (69 FR 60688). The supplemental letters dated April 11, 2005, and July 11, 2006, provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

The Commission's regulatory requirements for the content of technical specifications are set forth in 10 CFR 50.36. This regulation requires that the TSs include items in five categories: (1) safety limits, limiting safety system settings, and limiting control settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls. Paragraph (c)(1)(ii)(A) of Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Technical Specifications," requires in part, that, where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded.

Regulatory Guide (RG) 1.105, Revision 3, "Setpoints for Safety-Related Instrumentation," describes a method acceptable to the staff for complying with the Commission's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the technical specification limits.

3.0 BACKGROUND

The revisions (the trip setpoint column title, the trip setpoint inequality signs, the AV inequality sign, the term "nominal" for limiting values) and the Bases changes are being proposed in response to an NRC identified concern that TVA discontinue using inequalities with nominal trip setpoint values. NRC Inspection Report Nos. 50-327/95-26 and 50-328/95-26, dated January 30, 1996 (NUDOCS 9602120160), includes a non-cited violation where inspectors determined that the licensee failed to provide engineered safety feature actuation system (ESFAS) instrumentation surveillance procedures which met the requirement of TS 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation." This issue concerned the incorrect use of ESFAS instrumentation "trip setpoint" and "allowable values" when performing instrument calibration. Several of the values in the Sequoyah TS ESFAS instrumentation table are bounded by "equal to or greater" symbols (≥) or "equal to or less than" symbols (≤). These values were considered to be nominal values even though they were bounded by the inequality

symbols. The proposed changes are similar to TS changes that have been approved for the Vogtle Electric Generating Plant and Millstone Nuclear Power Station, Unit 3, and the initial TSs for the Watts Bar Nuclear Plant. In addition, the changes are consistent with NRC-approved Technical Specification Task Force (TSTF) item TSTF-355.

The licensee is not requesting implementation of the nominal setpoint philosophy for the containment purge air exhaust radiation monitor in TS Table 3.3-4 in order to continue to set this function at a more conservative value. The licensee plans to submit another TS change to move this function from the ESF requirements to a new specification consistent with the standard TSs, which retain the inequality for these types of setpoints. The staff finds that the retention of this inequality is reasonable based on the standard requirements and their application to radiation monitoring functions. Plus and minus allowances for AVs are changed to inequality signs for consistency with the philosophy that AVs are limits and should use inequalities to indicate the limits.

The licensee proposes to change the setpoint and AV for the intermediate range neutron flux P-6 permissive to provide a value that supports plant operation and will be consistent with the nominal trip setpoint methodology. The licensee replaced the intermediate range channels in 1990 and revised the measurement parameters from amperes to percent reactor thermal power (RTP). The RTP value chosen at that time was the best estimate available; however, operating experience showed this value was not the optimum choice. Achieving the P-6 value during startup allows the trips provided by the source range to be blocked. If the trip is blocked too early in the startup evolution, the source range function could be blocked before sensitive criticality events where the source range function is useful. If the source range function is not blocked when P-6 is achieved, using the function during criticality will degrade a feature that is intended to remind the operators to block a trip function. This would be a human factors concern and could lead to an unnecessary trip of the unit.

The licensee proposed a revision of the trip setpoint for the fuel storage pool area radiation monitor to resolve an identified non-conservatism. During reviews of dose calculations for fuel-handling accidents, the licensee discovered errors in the assumptions that made the current setpoint values less restrictive than required to maintain the assumptions of the accident analysis. The licensee initiated corrective actions and verified that the settings for these monitors acceptably accommodated the identified errors. The licensee is maintaining these monitors administratively in accordance with the Corrective Action Program (CAP) until the TSs can be revised. The proposed revision will establish a new setpoint limit to meet the corrected dose analysis.

The change in the minimum number of channels operable for the AFW Load Shed Timers and the EDG Start and Load Shed Timers and SI/Degraded Voltage Logic Enable Timers of TS Table 3.3-3 will provide a more appropriate requirement in consideration of the plant design. The timers support the actuation of the loss-of-power start of the AFW pumps, the EDGs, and load shed initiation. This function is provided by both trains of power, and the voltage sensors for each train are arranged in a two-out-of-three logic scheme. Using redundant timers in each train of this function after the detection of low voltage exceeds the design requirement. Only one timer is needed to satisfy the loss-of-power start function. Therefore, the required minimum channels operable per shutdown board for the AFW and EDG timers will be reduced from two to one.

4.0 TECHNICAL EVALUATION

4.1 Revision to Nominal Trip Setpoints and Removal of Inequality Signs:

The licensee has proposed to rename the "Trip Setpoint" column of TS Tables 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," and the "Trip Setpoint" column of TS Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Setpoints," to become the "Nominal Trip Setpoint." In addition, the licensee has proposed to eliminate the inequality signs from the same columns of TS Tables 2.2-1 and 3.3-4.

The title change from "Trip Setpoint" to "Nominal Trip Setpoint" and the removal of the inequality signs is not a change in the current application of the TSs. The SQN setpoint methodology considers the values in the trip setpoint column to be nominal values and the calibration procedures have implemented the requirements accordingly. Similar changes from "Trip Setpoint" to "Nominal Trip Setpoint" are included in:

- TS 2.2, "Limiting Safety System Settings,"
- TS Table 2.2-1, Functional Unit 13, "Steam Generator Water Level - Low-Low,"
- TS Table 2.2-1, Notes 1, 2, 3, and 4,
- TS 3/4.3.2, "Engineered Safety Feature Actuation System Instrumentation," and
- TS Table 3.3-4, Functional Unit 6.c, "Main Steam Generator Water Level - Low-Low."

In summary, the staff considers the title change from "Trip Setpoint" to "Nominal Trip Setpoint" and the removal of the inequality signs changes to be administrative changes that resolves the staff's concern associated with using an inequality sign with a nominal value. Therefore, the staff finds these proposed changes acceptable.

4.2 Removal of "Nominal" from Note 1 to TS Table 2.2-1

Note 1 to TS Table 2.2-1 refers to the Overtemperature ΔT trip setpoint. Note 1 defines a parameter T' as:

$$T' \leq 578.2°F \text{ (Nominal } T_{avg} \text{ at RATED THERMAL POWER)}$$

The classification of the Overtemperature ΔT T' parameter as a nominal value is not accurate with the evolution of the nominal setting philosophy utilized for reactor protection system and engineered safety feature instrumentation. The T' value is a limiting parameter for TS compliance and should not be described as a nominal value. The description of this value, as a limit with the appropriate inequalities, is the most accurate method for representation.

Therefore, the licensee has proposed revising the definition of T' to be:

$$T' \leq 578.2°F \text{ (} T_{avg} \text{ at RATED THERMAL POWER)}$$

The staff agrees that the value of T' should not be described as a nominal value. Therefore, the staff finds the proposed change acceptable.