VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

June 16, 2005

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

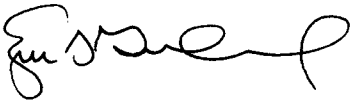
Serial No. 05-330
NL&OS/ETS R1'
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATION CHANGES
REVISED FREQUENCY FOR TADOT OF P-4 INTERLOCK
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

In a letter dated March 1, 2005 (Serial No. 05-111), Virginia Electric and Power Company (Dominion) requested amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes were requested to revise the frequency for the Trip Actuating Device Operational Test (TADOT) of the P-4 Interlock Function. In your May 19, 2005 letter, the NRC staff requested additional information associated with the proposed changes. A subsequent conference call was also held with the NRC staff on June 7, 2005 to discuss the questions. The information requested is provided in the attachment to this letter.

If you have any further questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,



Eugene S. Grecheck
Vice President – Nuclear Support Services

Attachment

Commitments made in this letter: None

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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck who is Vice President – Nuclear Support Services of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 16TH day of June, 2005.

My Commission Expires: May 31, 2006.

Vicki L. Hull
Notary Public

(SEAL)

Attachment 1

Serial No. 05-330

Proposed Technical Specification Changes
Revised Frequency for TADOT of P-4 Interlock
Request for Additional Information Response

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

RAI – REVISED FREQUENCY FOR TADOT OF P-4 INTERLOCK

In a letter dated March 1, 2005 (Serial No. 05-111), Virginia Electric and Power Company (Dominion) requested amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes were requested to revise the frequency for the Trip Actuating Device Operational Test (TADOT) of the P-4 Interlock Function. In a May 19, 2005 letter, the NRC staff requested additional information associated with the proposed changes. A subsequent conference call was held on June 7, 2005 to discuss the questions with the NRC staff. A response to your RAI questions is provided below:

Background

During the development and implementation of the Standard Improved Technical Specifications, the TADOT surveillance requirement of "once per Reactor Trip Breaker cycle" specified in NUREG-1431, Rev 1, was adopted in lieu of retaining the original surveillance frequency of "18 months." We failed to initiate a Justification for Deviation (JFD) at that time to maintain the original Technical Specifications surveillance frequency of 18 months.

Currently, the performance of TADOT testing is being performed following every cycle of the reactor trip or bypass reactor trip breakers. This occurs a minimum of eight times to as many as 18 times a refueling outage during critical path time over a one to two day period. This has created an unnecessary and unintended burden to perform this TADOT during an outage.

NRC Question 1

The P-4 interlock is enabled when a reactor trip breaker (RTB) and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic safety injection (SI) initiation is blocked after a time delay. This function allows operators to take manual control of SI systems after the initial phase of injection is complete. Once SI is blocked, automatic actuation of SI cannot occur until the RTBs have been manually closed. The RTB position switches provide input to the P-4 interlock.

NUREG-1431, Rev 3, "Standard Technical Specifications Westinghouse Plants," requires that the surveillance frequency for P-4 interlock is once per RTB cycle, every 62 days on a staggered test basis. This license amendment request (LAR) proposes to change the surveillance frequency for P-4 interlock to once every refueling outage, every 18 months. In order for the NRC staff to approve this type of surveillance frequency change, the licensee should provide justification to demonstrate that the

proposed TS change is based on either hardship (such as challenges to the protection system or increased radiation exposure to plant personnel) or on a risk-informed basis.

Dominion Response:

Background:

During the development and implementation of the Standard Improved Technical Specifications, the TADOT surveillance requirement of "once per Reactor Trip Breaker cycle" specified in NUREG-1431, Rev 1, was adopted in lieu of retaining the original North Anna Power Station Technical Specifications surveillance frequency of "18 months." As stated in the Discussion of Changes, the purpose of the proposed change is to modify the frequency of TADOT testing from "once every reactor trip breaker cycle" to "18 months" to be consistent with the original licensing bases at North Anna and TSTF-444-T, Rev 1. Since the implementation of the Improved Standard Technical Specifications at North Anna, the performance of TADOT testing is required every time the reactor trip breaker is cycled. This occurs a minimum of eight times to as many as 18 times during a refueling outage within a one to two day period and requires approximately 20 to 30 minutes (minimum of a three man team) to complete each test. This does not include preparation time nor pre-job brief time. The testing impacts outage critical path time and has created an unnecessary burden to perform this TADOT. Since the testing occurs over a short period of time, the usefulness of the P-4 testing is of insignificant value to component reliability or plant safety. Therefore, is not commensurate with the burden imposed.

As noted in the Technical Specifications Bases, to satisfy the requirements of the Surveillance Requirement for the performance of the TADOT for the P-4 interlock per Surveillance Requirement 3.3.2.10, the reactor trip breaker and associated bypass breaker must be opened at the same time. Thus, the plant cannot be in Modes 1 or 2 to perform this TADOT test. Therefore, the P-4 TADOT may only be performed at an 18 month frequency if the unit remains at power the entire operating cycle. However, as noted above, the TADOT test may be required numerous times in a few day period to meet the surveillance frequency requirements. This TADOT requires a verification of the change of state of a single set of contacts. It should be noted that the P-4 TADOT required by Surveillance Requirement 3.3.2.10 is not performed every 62 days on a staggered test basis. As noted above, the P-4 TADOT can only be performed with the unit shutdown with the reactor trip breakers open. The Reactor Protection and Engineering Safety Features Actuation Logic Testing is performed 31 days on a staggered test basis. This Actuation Logic Testing of the Reactor Trip and Engineering Safety Features automatic trip and actuation logic includes the performance of a TADOT of the reactor trip and bypass breakers in accordance with Technical Specification Surveillance Requirement 3.3.1.4.

The proposed changes to perform the TADOT on an 18 month frequency are based upon and are consistent with the surveillance frequency that was in effect prior to North Anna's conversion to the Improved Standard Technical Specifications

(NUREG-1431, Rev 1). The changes are also consistent with the recommendations and proposed changes specified in TSTF-444-T, Rev 1, and the requirements specified in NUREG-0452, Rev 4, to perform the TADOT once every refueling interval. The 18 month surveillance frequency will eliminate the hardship of testing the P-4 interlock numerous times during reactor startup and provide adequate assurance of operability of the P-4 interlock function.

Current TADOT Testing

Current TADOT testing is performed by two electricians and is coordinated by Operations personnel. The voltage across the contacts is measured while the Reactor Trip Breakers and Bypass Breakers are open and then checked again when the Reactor Trip Breakers are cycled. A successful test of the required contacts of a channel relay may be performed by the verification of the changes of a single contact of the relay. The change of state occurs when the Reactor Trip Breaker or Bypass Breaker is closed because the contacts for the Reactor Trip Breakers and the Bypass Breakers are in series. As such, the performance of the TADOT for each P-4 interlock train is considered to be the combined completion of the "before breaker closure" contact check AND the "after breaker closure" contact check. Since the implementation of ITS and the performance of this TADOT testing, the results of the testing have been satisfactory. These contacts are associated with the input circuit to the Solid State Protection System for Feedwater isolation. The remaining three P-4 circuits, which include the MCR annunciator for Reactor Trip Turbine Trip, the Turbine Trip on Reactor Trip function, and the P-4 input to reset the Hi Steam Flow setpoint are checked by other station procedures at least once per refueling interval.

TADOT testing of the reactor trip and bypass breakers is also performed during Reactor Protection and Engineering Safety Features Actuation Logic Testing per Surveillance Requirement 3.3.1.4 on a 31 day staggered test bases. This surveillance tests the logic functions of the Solid State Protection System, as well as, the reactor trip and bypass breakers. The breakers are tested to ensure operability of the reactor trip and bypass breakers and that the breakers will open on a trip signal.

Request for 18 Month Testing Frequency

Since the implementation of the Improved Standard Technical Specifications at North Anna, the performance of TADOT testing is required every time the reactor trip breaker is cycled. This occurs a minimum of eight times to as many as 18 times during a refueling outage within a one to two day period and requires approximately 20 to 30 minutes (minimum of a three man team) to complete each test. This does not include preparation time nor pre-job brief time. These tests are performed during critical path time during the plant restart from the outage and has created an unnecessary and unintended burden to perform this TADOT.

Prior to ITS, the 18 month test was adequate to ensure that the P-4 interlock was operable to perform its intended safety function. Since the initial testing of the P-4 interlock functions, there have been no identified failures of the P-4 interlock. This includes previous testing at the 18 month frequency and currently at the frequency of once per reactor trip breaker cycle. The increased testing to "once every reactor trip breaker cycle" is unnecessary to ensure that the P-4 interlock will perform its intended safety function. Most of the additional P-4 interlock testing is performed over a few day period during plant startup from a refueling outage prior to the reactor being critical. No extra protection is provided by performing multiple testing over a short period of time (e.g., normally within one day). The reactor trip breaker position switches that provide input to the P-4 interlock only function to open or close the contacts. Therefore, this function has no adjustable trip setpoints with which to associate an allowable value. The P-4 interlock is generated by an auxiliary contact in the reactor trip breaker and not subject to instrument drift. Thus, reducing the testing frequency to "once every 18 months" does not adversely impact safety and does not require any changes to the ESFAS instrumentation design requirements.

NRC Question 2

NUREG-1431, Revision 3, specifies for P-4 interlock that the applicable modes are 1, 2, and 3. This LAR proposes to add Mode 4 for this function. Additional analysis is required to support the proposed change.

Dominion Response:

The addition of Mode 4 is discussed in TSTF-444, Rev 1. The block of the auto Safety Injection (SI) signal is required to support long-term ECCS operation in the post-LOCA recirculation mode. This Function must be operable in Modes 1, 2, 3, and 4 when the reactor may be critical or approaching criticality, or when the support of the auto SI block function is required. The Required Modes for the various P-4 functions are specified in the "Engineered Safety Feature Actuation System Interlocks – Reactor Trip, P-4" section of the Bases.

NRC Question 3

The March 1, 2005, submittal cited that the proposed changes are consistent with the intent of the Westinghouse Owners Group Technical Specification Task Force Process TSTF-444, Rev 1, "ESFAS Interlocks P-4, P-11, & P-12 LCO Actions and Surveillance Requirements Revisions." Since TSTF-444 has not been approved by the NRC staff, the P-4 interlock-related information contained in TSTF-444 should be submitted with this LAR.

Dominion Response:

A copy of TSTF-444, Rev 1, "ESFAS Interlock P-4, P-11, & P-12 LCO Actions and Surveillance Requirements Revisions," is included for your information. According to the Westinghouse Owners Group Status Report, TSTF-444 was submitted to the NRC on August 7, 2002. However, it was later withdrawn by WOG on October 31, 2003 due to imposed review fees by the NRC. The changes proposed in the TSTF change request then became an Improved Standard Technical Specifications Change Traveler. While it is understood that the NRC staff had not approved the P-4 interlock-related information contained in TSTF-444, the recommendations and proposed changes from the TSTF-444, Rev 1, traveler associated with the P-4 interlock were only used as the basis of our plant specific Technical Specification changes for this LAR submittal.

As stated in our LAR submittal, the changes are consistent with TSTF-444-T, Rev 1. TSTF-444 proposed the deletion of Surveillance 3.3.2.11 and the addition of the surveillance for the P-4 Interlock to Surveillance 3.3.2.8 with the frequency of 18 months, and the applicability of Mode 4. Changes were also recommended to the Bases to correct the design basis of the ESFAS Interlock for P-4 which were also incorporated into the proposed changes for this LAR submittal.

NRC Question 4

The March 1, 2005, submittal cited precedents from five other plants (Wolf Creek, Byron, Braidwood, Comanche Peak and DC Cook) that maintained their 18-month surveillance test requirement to perform the TADOT of the P-4 interlock function. The NRC staff found that these plants were licensed on that basis; therefore, these precedents cannot be considered as a precedent for a technical specification change as requested in this LAR. However, the operational experience from these plants may be able to be credited as part of a risk-informed basis.

Dominion Response:

The intent of the precedents listed was to identify several plants that took exception to the specific requirements of NUREG-1431 during ITS conversion whereby they retained their original requirement to perform the TADOT during their refueling outage intervals in lieu of once every reactor trip breaker cycle. North Anna had that same requirement to perform the TADOT every 18 months prior to adopting NUREG-1431 for the Improved Standard Technical Specifications. We failed to initiate a Justification for Deviation (JFD) at that time to maintain the current Technical Specifications surveillance frequency of 18 months for North Anna. The proposed amendment requests a return to the previous surveillance frequency to eliminate unnecessary testing, which is consistent with the cited examples that maintained the 18 month surveillance.

Technical Specification Task Force
Improved Standard Technical Specifications Change Traveler

ESFAS Interlocks P-4, P-11 & P-12 LCO Actions and Surveillance Requirements Revisions

NUREGs Affected: ☐ 1430 ☑ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Note: This "T" Traveler has been reviewed and approved by the Technical Specification Task Force and is made available as a template for plant-specific license amendments. This Traveler has not been reviewed and approved by the Nuclear Regulatory Commission.

Classification: 1) Technical Change Recommended for CLIIP?: No

Correction or Improvement: (Unassigned)

Industry Contact: Denny Buschbaum, (254) 897-5851, dbuschb1@txu.com

1.0 DESCRIPTION

The proposed change to the Improved Standard Technical Specifications (ISTS) will accomplish the following: Add a new functional item, "Automatic Actuation Logic and Actuation Relays," on Engineered Safety Feature Actuation System (ESFAS) Instrumentation Table 3.3.2-1, which includes Mode (1, 2 ,3 & 4), Channel (2 trains), Condition (M) and Surveillance Requirements (3.3.2.2, 3.3.2.4 & 3.3.2.6), under Function No. 8 "ESFAS Interlocks." Revise Condition L by changing the requirements from "one" to "two or more required channels inoperable." Add new Condition M, which will be applicable to the ESFAS interlock logic and relays with "one train inoperable." Delete Surveillance 3.3.2.11 under Technical Specification (TS) 3.3.2, "ESFAS Instrumentation," and add new Surveillance 3.3.2.8 to P-4 on Table 3.3.2-1. Delete Surveillance 3.3.2.1 from P-11 & P-12 on Table 3.3.2-1. Revise Bases Section B 3.3.2, "ESFAS Instrumentation," to reflect the correct design basis of the ESFAS Interlocks P-4, P-11 & P-12.

2.0 PROPOSED CHANGE

With regard to ESFAS Interlock Functions P-4 (Reactor Trip), P-11 (Pressurizer Pressure), and P-12 (Tavg Low-Low), the NUREG-1431 Revision 2 LCO Actions, Surveillance Requirements and Bases are not technically in agreement with the ESFAS Interlock hardware or the design bases.

ISTS Condition L is revised consistent with NUREG-0452. This ISTS Condition addresses an inoperable ESFAS interlock function (P-11 or P-12). The P-11 interlock function is comprised of three instrument channels and two actuation logic trains, each with a two-out-of-three logic circuit and associated master and slave relays. The P-12 interlock function is comprised of three or four instrument channels and two actuation logic trains, each with a two-out-of-three or two-out-of-four logic circuit and associated master and slave relays. The P-4 interlock function is comprised of two trains of cell switches and auxiliary contacts, which sense reactor trip and bypass breaker position, and the corresponding logic circuits in each SSPS train. In addition, the P-4 circuits in the Reactor Trip switchgear provide direct actuation signals (e.g., turbine trip). The corresponding NUREG-0452 Actions address multiple inoperable instrument channels and an inoperable logic circuit in one SSPS train. The NUREG-0452 Actions were more clearly designed to address an inoperable interlock function, which may have resulted from more than one inoperable instrument channel or an inoperable train of logic. NUREG-0452 required no action for one inoperable channel.

The following changes are made:

ISTS Condition L will apply when one or more channels are inoperable, and ISTS Condition M will apply when one train is inoperable. SR 3.3.2.11 is deleted. Table 3.3.2-1 is revised by the addition of a new function, 8.a, "Automatic Actuation Logic and Actuation Relays." This new function is applicable in Modes 1, 2, 3, and 4 and the applicable Condition and surveillance requirements are Condition M and SR 3.3.2.2, SR 3.3.2.4, and SR 3.3.2.6. Existing functions 8.a. through 8.c are therefore renumbered. Renumbered function 8.b. (old 8.a.), "Reactor Trip, P-4," is revised by replacing Condition F with Condition C and replacing SR 3.3.2.11 with SR 3.3.2.8. SR 3.3.2.1 is deleted from both renumbered function 8.c. and 8.d. Applicable Bases changes are made.

3.0 BACKGROUND

Based on a comparison of the ESFAS Interlock LCO Actions and the Surveillance Requirements in NUREG-0452 Revision 4 (Tables 3.3-3 and 4.3-2) to NUREG-0452 Revision 3 (SR 4.3.2.3 and Tables 3.3-3 and 4.3-2), Revision 4 introduced technical inadequacies which were carried-over into NUREG-1431.

4.0 TECHNICAL ANALYSIS

The P-4 interlock functions are developed on a per train basis by Reactor Trip Breaker (RTB) cell switches and auxiliary contacts, Solid State Protection System (SSPS) logic circuits and safeguards actuation circuits and relays, and associated interface relay circuits. Each P-11 and P-12 function is developed on a per train basis by inputs from shared channels and outputs from independent logic circuits and safeguards actuation circuits and relays. To be consistent with the hardware and the other ESFAS functions on Table 3.3.2-1, there must be a separate functional item for the P-4, P-11 & P-12 actuation logic and relays with applicable mode, channel, condition and surveillance requirements. Because the P-11 & P-12 logic requires two-out-of-four (or -three) channels above (or below) the setpoint (or reset) before the interlock can achieve the required state, no action is required until two (or three) channels are inoperable. Some P-4 safety functions (e.g., turbine trip and reset high steam flow setpoint) can only be tested when the plant is shutdown; therefore, a TADOT test frequency of each RTB cycle (SR 3.3.2.11) is not appropriate. The P-11 & P-12 channel check requirement (SR 3.3.2.1) is a duplication of the channel check required for other pressurizer pressure and RCS Tavg ESFAS functions. The TS Bases do not capture important functions, which must be included in surveillance testing, for P-4 (seal-in Feed Water Isolation (FWI) by Safety Injection (SI) and reset high steam flow setpoint), P-11 (interlock pressurizer PORVs closed), and P-12 (interlock steam dump valves closed) as defined by the Westinghouse "Reactor Control and Protection System Functional Requirements." The permissives (P-4, P-11, and P-12) are not directly credited in the safety analyses, although some analyses "model" selected permissive functions, such as the turbine trip on reactor trip function of the P-4 permissive, as it is expected to occur and result in a limiting transient for many events.

The ISTS surveillance SR 3.3.2.11 is deleted. The ISTS surveillance SR 3.3.2.11 was applicable to the P-4 interlock. The required P-4 interlock testing previously addressed by ISTS SR 3.3.2.11 is replaced with ISTS SR 3.3.2.8. ISTS SR 3.3.2.8 requires a TADOT be performed every 18 months for manual initiation functions and is consistent with the NUREG-0452 P-4 testing frequency specified on Table 4.3-2 for the ESFAS interlocks I. By assigning ISTS SR 3.3.2.8 to the P-4 interlock instead of ISTS SR 3.3.2.11, the ISTS frequency of testing the P-4 interlock "Once per reactor trip breaker cycle" is revised to be consistent with the NUREG-0452 18 month test frequency. The P-4 testing requirements associated with ITS SR 3.3.2.8 are also consistent with NUREG-0452 surveillance 4.3.2.2, which requires that the total interlock function be demonstrated operable every 18 months. Therefore, consistent with NUREG-0452, the P-4 inputs to the SSPS logic circuits and P-4 actuation signals (e.g., turbine trip) will be tested under this ISTS TADOT. Additionally, the "setpoint verification not required" note which modifies ISTS SR 3.3.2.8 is revised to include the P-4 interlock consistent with the P-4 ISTS surveillance SR 3.3.2.11 (the reference to manual initiation functions is deleted from the note).

The ISTS surveillances associated with the P-11 and P-12 ESFAS interlock functions are revised consistent with the NUREG-0452 surveillance requirements for these functions. Separate surveillance requirements will be provided for the instrument channel and the actuation logic. The ISTS 12 hour channel check surveillance requirement for these functions is deleted, since it is redundant to channel checks performed for the other pressurizer pressure and RCS temperature ESF functions. This approach is also consistent with the RTS Permissive/Interlock channel check surveillance (i.e., no channel check is specified when the channel check is performed for other RTS functions). The NUREG-0452 Surveillance SR 4.3.2.2 and Table 4.3-2 require that the interlock logic be tested with the Automatic Actuation Logic test and that the total interlock function be tested and the individual channels be calibrated every 18 months. To make the change from the NUREG-0452 to the ISTS format, the Automatic Actuation Logic and Actuation Relays function for the interlocks was broken out and listed separately. This approach/format is consistent with all other ESF functions. The logic for generating each permissive/interlock signal will be tested for each interlock function as described below to meet the logic circuit testing requirements of NUREG-0452 SR 4.3.2.2. The total interlock function will be tested with ISTS SR 3.3.2.9 Channel Calibration, ISTS SR 3.3.2.2 Actuation Logic Test, ISTS SR 3.3.2.4 Master Relay Test, and ISTS 3.3.2.6 Slave Relay Test. The ISTS SR 3.3.2.5 COT for P-11 and P-12 will be performed on a 92-day interval in conjunction with the associated ESFAS pressure and temperature channel COT. This frequency is consistent with the setpoint uncertainty calculation allowances for rack drift for other ESF functions that utilize identical hardware. The 18-month calibration for P-11 and P-12 will complete the total interlock functional check and coincide with the refueling outage channel calibration requirement from the NUREG-0452 surveillance requirement 4.3.2.2 and Table 4.3-2. The ISTS changes also ensure that the Logic Test, Master and Slave Relay Tests, COT and Channel Calibration requirements for P-12 are identical to the surveillance requirements for the RCS T_{avg} Low-Low input for Main Steam Line Isolation (MSLI).

The ISTS Automatic Actuation Logic and Actuation Relay function associated with the P-4, P-11 and P-12 interlock functions was added to be consistent with the NUREG-0452 surveillance requirement for these functions. NUREG-0452 surveillance requirement 4.3.2.2 required that the logic for the interlock be demonstrated operable during the automatic actuation logic test. This new line item under the function provides for the explicit testing of the SSPS automatic actuation logic associated with P-4, P-11 and P-12. Additionally, this line item will contain the surveillance requirements for testing the Master and Slave relays associated with the P-11 function of interlocking closed the PORVs and the P-12 function of interlocking closed the Steam Dump Control System valves. This change maintains the format for these functions as specified in the NUREG-0452 LCO 3.3.2 and surveillance requirement 4.3.2.2 and allows assignment of a separate Condition for the interlock function and the interlock channels. The change also provides consistency with all other ESFAS functions that utilize the SSPS logic circuits and safeguards actuation circuits and relays.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

The proposed change to the ISTS will accomplish the following: Add a new functional item, "Automatic Actuation Logic and Actuation Relays," on ESFAS Instrumentation Table 3.3.2-1, which includes Mode (1, 2, 3 & 4), Channel (2 trains), Condition (M) and Surveillance Requirements (3.3.2.2, 3.3.2.4 & 3.3.2.6), under Function No. 8 "ESFAS Interlocks." Revise Condition L by changing the requirements from "one or more channels inoperable" to "one or more required channels inoperable." Add new Condition M, which will be applicable to the ESFAS interlock logic and relays with "one train inoperable." Delete surveillance 3.3.2.11 under TS 3.3.2, "ESFAS Instrumentation," and add new surveillance 3.3.2.8 to P-4 on Table 3.3.2-1. Delete surveillance 3.3.2.1 from P-11 & P-12 on Table 3.3.2-1. Revise Bases Section B 3.3.2, "ESFAS Instrumentation," to reflect the correct design basis of the ESFAS Interlocks P-4, P-11 & P-12.

In accordance with the criteria set forth in 10 CFR 50.92, the proposed changes to NUREG-1431 have been evaluated and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated.

Response: No

The proposed changes do not significantly increase the probability or consequences of an accident previously evaluated in the Final Safety Analysis Report (FSAR). These interlocks and the associated testing do not directly initiate an accident. The consequences of accidents previously evaluated in the FSAR are not adversely affected by these proposed changes because the changes are made to accurately reflect the design of the ESFAS system and format of the ISTS. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated.

Response: No

The proposed changes do not create the possibility of a new or different kind of accident than any accident already evaluated in the FSAR. No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed Technical Specifications change does not challenge the performance or integrity of any safety-related systems. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously analyzed.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed changes do not involve a significant reduction in a margin of safety. The proposed changes are made to accurately reflect the design of the ESFAS system and format of the ISTS. The nominal actuation setpoints specified by the Technical Specifications and the safety analysis limits assumed in the transient and accident analysis are unchanged. The margin of safety associated with the acceptance criteria for any accident is unchanged. Therefore, the proposed change will not significantly reduce the margin of safety as defined in the Technical Specifications.

5.2 Applicable Regulatory Requirements/Criteria

The regulatory bases and guidance documents associated with the systems discussed in this proposed change include:

GDC-13 requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

GDC-20 requires that the protection system(s) shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC-21 requires that the protection system(s) shall be designed for high functional reliability and testing.

GDC-22 through GDC-25 and GDC-29 require various design attributes for the protection system(s), including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

Regulatory Guide 1.22 discusses an acceptable method of satisfying GDC-20 and GDC-21 regarding the periodic testing of protection system actuation functions. These periodic tests should duplicate, as closely as practicable, the performance that is required of the actuation devices in the event of an accident.

10 CFR 50.55a(h) requires that the protection systems meet IEEE 279-1971. Section 4.9 - 4.11 of IEEE 279-1971 discuss testing provisions for protection systems.

There have been no changes to the ESFAS instrumentation design such that any of the regulatory requirements and guidance documents discussed above would come into question. This TSTF revises surveillance testing requirements on the ESFAS instrumentation consistent with those requirements and guidance documents. The evaluation performed in Section 4.0 concludes that licensees will continue to comply with the applicable regulatory requirements.

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

Revision History

17-Jun-04

OG Revision 0 Revision Status: Active

Revision Proposed by: WOG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 26-Mar-02

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 20-May-02

TSTF Review Information

TSTF Received Date: 20-May-02 Date Distributed for Review 21-Jun-02

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 01-Aug-02

NRC Review Information

NRC Received Date: 07-Aug-02

Final Resolution: TSTF Withdraws Final Resolution Date: 31-Oct-03

TSTF Revision 1 Revision Status: Active

Revision Proposed by: WOG

Revision Description:
TSTF not willing to pay review fees for this change. The TSTF withdrew the change from NRC review and made it a "T" Traveler.

TSTF Review Information

TSTF Received Date: 15-Oct-03 Date Distributed for Review 15-Oct-03

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved for Use Date: 15-Oct-03

Affected Technical Specifications

LCO 3.3.2 ESFAS Instrumentation

	Change Description:	Table 3.3.2-1
LCO 3.3.2 Bases	ESFAS Instrumentation	
Action 3.3.2.C Bases	ESFAS Instrumentation	
Action 3.3.2.F Bases	ESFAS Instrumentation	
Action 3.3.2.L	ESFAS Instrumentation	
Action 3.3.2.L Bases	ESFAS Instrumentation	
Action 3.3.2.M	ESFAS Instrumentation	
	Change Description:	New
Action 3.3.2.M Bases	ESFAS Instrumentation	
	Change Description:	New
SR 3.3.2.2 Bases	ESFAS Instrumentation	
SR 3.3.2.5 Bases	ESFAS Instrumentation	
SR 3.3.2.8	ESFAS Instrumentation	
SR 3.3.2.8 Bases	ESFAS Instrumentation	
SR 3.3.2.11	ESFAS Instrumentation	
	Change Description:	Deleted
SR 3.3.2.11 Bases	ESFAS Instrumentation	
	Change Description:	Deleted

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. One channel inoperable.	**- NOTE -** One additional channel may be bypassed for up to [4] hours for surveillance testing.	
	K.1 Place channel in bypass.	6 hours
	OR	
	K.2.1 Be in MODE 3.	12 hours
	AND	
	K.2.2 Be in MODE 5.	42 hours
L. One or more channels inoperable. required	L.1 Verify interlock is in required state for existing unit condition.	1 hour
	OR	
	L.2.1 Be in MODE 3.	7 hours
	AND	
INSERT 1 →	L.2.2 Be in MODE 4.	13 hours

SURVEILLANCE REQUIREMENTS

- NOTE -

Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours

INSERT 1

M. One train inoperable.	M.1	Verify interlock is in required state for existing unit conditions.	1 hour
	OR		
	M.2	---------- - NOTE - One train my be bypassed for up to [4] hours for Surveillance testing, provided the other train is OPERABLE. ----------	
		Restore train to OPERABLE status.	6 hours
	OR		
	M.3.1	Be in MODE 3.	12 hours
	AND		
	M3.2	Be in MODE 5.	42 hours

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.3	**- NOTE -** The continuity check may be excluded. Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.4	Perform MASTER RELAY TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.5	Perform COT.	92 days
SR 3.3.2.6	Perform SLAVE RELAY TEST.	[92] days
SR 3.3.2.7	**- NOTE -** Verification of relay setpoints not required. Perform TADOT.	[92] days
SR 3.3.2.8	**- NOTE -** Verification of setpoint not required for manual initiation functions. Perform TADOT.	[18] months
SR 3.3.2.9	**- NOTE -** This Surveillance shall include verification that the time constants are adjusted to the prescribed values. Perform CHANNEL CALIBRATION.	[18] months

or interlock

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.2.10	---------- **- NOTE -** ---------- Not required to be performed for the turbine driven AFW pump until [24] hours after SG pressure is ≥ [1000] psig. ----------	
	Verify ESFAS RESPONSE TIMES are within limit.	[18] months on a STAGGERED TEST BASIS
SR 3.3.2.11	---------- **- NOTE -** ---------- Verification of setpoint not required. ----------	
	Perform TADOT.	Once per reactor trip breaker cycle

Table 3.3.2-1 (page 8 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
7. Automatic Switchover to Containment Sump						
c. RWST Level - Low Low	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [15]%	[18]%
Coincident with Safety Injection	*Refer to Function 1 (Safety Injection) for all initiation functions and requirements.*					
and						
Coincident with Containment Sump Level - High	1,2,3,4	4	K	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9 SR 3.3.2.10	≥ [30] in. above el. [703] ft	[ ] in. above el. [ ]ft
8. ESFAS Interlocks						
a. Reactor Trip, P-4	1,2,3	1 per train, 2 trains		SR 3.3.2.8	NA	NA
b. Pressurizer Pressure, P-11	1,2,3	2	L	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≤ [1996] psig	[ ] psig
c. T_{avg} - Low Low, P-12	1,2,3	2 [1] per loop	L	SR 3.3.2.1 SR 3.3.2.5 SR 3.3.2.9	≥ [550.6]°F	[553]°F

- REVIEWER'S NOTE -
Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.

INSERT 2

a.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	M	SR 3.3.2.2 SR 3.3.2.4 SR 3.3.2.6	NA	NA

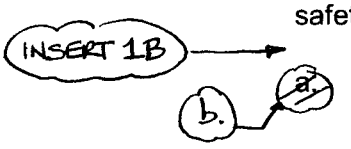
BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

These Functions must be OPERABLE in MODES 1, 2, 3, and 4 when there is a potential for a LOCA to occur, to ensure a continued supply of water for the ECCS pumps. These Functions are not required to be OPERABLE in MODES 5 and 6 because there is adequate time for the operator to evaluate unit conditions and respond by manually starting systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. System pressure and temperature are very low and many ESF components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of unit systems.

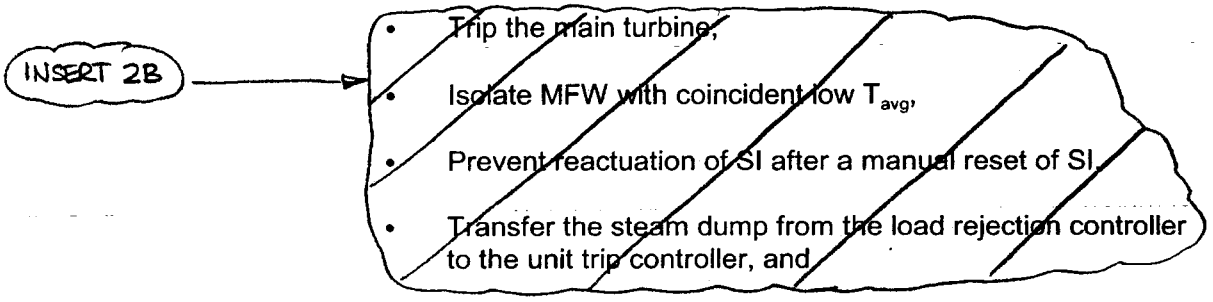
8. Engineered Safety Feature Actuation System Interlocks

To allow some flexibility in unit operations, several interlocks are included as part of the ESFAS. These interlocks permit the operator to block some signals, automatically enable other signals, prevent some actions from occurring, and cause other actions to occur. The interlock Functions back up manual actions to ensure bypassable functions are in operation under the conditions assumed in the safety analyses.



Engineered Safety Feature Actuation System Interlocks - Reactor Trip, P-4

The P-4 interlock is enabled when a reactor trip breaker (RTB) and its associated bypass breaker is open. Once the P-4 interlock is enabled, automatic SI initiation is blocked after a [ ] second time delay. This Function allows operators to take manual control of SI systems after the initial phase of injection is complete. Once SI is blocked, automatic actuation of SI cannot occur until the RTBs have been manually closed. The functions of the P-4 interlock are:



INSERT 1B

a. Engineered Safety Feature Actuation System Interlocks – Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

INSERT 2B

Function	Purpose	Required MODES
• [Isolate MFW with coincident T_{avg}	Feedwater isolation	1, 2]
• Trip the main turbine	Prevents excessive cooldown, thereby Condition II event does not propogate to Condition III event.	1, 2
• Prevent re-actuation of SI after a manual reset of SI	Allows alignment of ECCS for recirculation mode; prevents subsequent inadvertent alignment to injection mode by auto SI.	1, 2, 3, 4 (required to support SI function in MODE 4)
• [Reset high steam flow setpoint to no-load value 1) SI – High Steam Flow in Two Steam Lines Coincident With Steam Line Pressure – Low 2) SI – High Steam Flow in Two Steam Lines Coincident With T_{avg} – Low Low 3) Main Steam Line Isolation (MSLI) – High Steam Flow in Two Steam Lines Coincident With T_{avg} – Low Low 4) MSLI – High Steam Flow in Two Steam Lines Coincident With Steam Line Pressure – Low	Ensures setpoint is reset to low/zero power reference value following plant trip, regardless of turbine first stage pressure indication	1, 2, 3 (function not required if MSIVs are closed)]
• Prevent opening of the MFW isolation valves if they were closed on SI or SG Water Level – High High	Seal-in feedwater isolation to prevent inadvertent feeding of de-pressurized SG.	1, 2, 3

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- Prevent opening of the MFW isolation valves if they were closed on SI or SG Water Level - High High.

Each of the above Functions is interlocked with P-4 to avert or reduce the continued cooldown of the RCS following a reactor trip. An excessive cooldown of the RCS following a reactor trip could cause an insertion of positive reactivity with a subsequent increase in generated power. To avoid such a situation, the noted Functions have been interlocked with P-4 as part of the design of the unit control and protection system.

None of the noted Functions serves a mitigation function in the unit licensing basis safety analyses. Only the turbine trip Function is explicitly assumed since it is an immediate consequence of the reactor trip Function. Neither turbine trip, nor any of the other four Functions associated with the reactor trip signal, is required to show that the unit licensing basis safety analysis acceptance criteria are not exceeded.

The RTB position switches that provide input to the P-4 interlock only function to energize or de-energize or open or close contacts. Therefore, this Function has no adjustable trip setpoint with which to associate a Trip Setpoint and Allowable Value.

This Function must be OPERABLE in MODES 1, 2, and 3 when the reactor may be critical or approaching criticality. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because the main turbine, the MFW System, and the Steam Dump System are not in operation.

c. Engineered Safety Feature Actuation System Interlocks - Pressurizer Pressure, P-11

The P-11 interlock permits a normal unit cooldown and depressurization without actuation of SI or main steam line isolation. With two-out-of-three pressurizer pressure channels (discussed previously) less than the P-11 setpoint, the operator can manually block the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal (previously discussed). When the Steam Line Pressure - Low steam line isolation signal is manually blocked, a main steam isolation signal on Steam Line

Addition of feedwater to a steam generator associated with a steamline or feedline break could result in excessive containment building pressure.

Core

The

in the non-LOCA safety analysis

Block of the auto SI signals is required to support long-term ECCS operation in the post-LOCA recirculation mode.

3, and 4, as noted above,

or support of the auto SI block function is required

The P-11 interlock provides the following functions.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Pressure - Negative Rate - High is enabled. This provides protection for an SLB by closure of the MSIVs. With two-out-of-three pressurizer pressure channels above the P-11 setpoint, the Pressurizer Pressure - Low and Steam Line Pressure - Low SI signals and the Steam Line Pressure - Low steam line isolation signal are automatically enabled. The operator can also enable these trips by use of the respective manual reset buttons. When the Steam Line Pressure - Low steam line isolation signal is enabled, the main steam isolation on Steam Line Pressure - Negative Rate - High is disabled. The Trip Setpoint reflects only steady state instrument uncertainties.

the logic for these ESF actuation signals

switches (or buttons) associated with each ESFAS logic train.

automatically reinstate SI during normal unit startup and to

This Function must be OPERABLE in MODES 1, 2, and 3 to allow an orderly cooldown and depressurization of the unit without the actuation of SI or main steam isolation. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because system pressure must already be below the P-11 setpoint for the requirements of the heatup and cooldown curves to be met.

d.

e. Engineered Safety Feature Actuation System Interlocks - T_{avg} - Low Low, P-12

function is to automatically

with [two-out-of-three] [two-out-of-four] channels above the setpoint,

On increasing reactor coolant temperature, the P-12 interlock reinstates SI and High Steam Flow Coincident With Steam Line Pressure - Low or Coincident With T_{avg} - Low Low and provides an arming signal to the Steam Dump System. On decreasing reactor coolant temperature, the P-12 interlock allows the operator to manually block SI and High Steam Flow Coincident With Steam Line Pressure - Low or Coincident with T_{avg} - Low Low. On a decreasing temperature, the P-12 interlock also removes the arming signal to the Steam Dump System to prevent an excessive cooldown of the RCS due to a malfunctioning Steam Dump System.]

and MSLI on Steam Line Pressure - Low, or

INSERT 3B

Since T_{avg} is used as an indication of bulk RCS temperature, this Function meets redundancy requirements with one OPERABLE channel in each loop. In three loop units, these channels are used in two-out-of-three logic. In four loop units, they are used in two-out-of-four logic.

The Trip Setpoint and reset reflect steady state instrument uncertainties.

INSERT 3B

[On decreasing temperature with [two-out-of-three][two-out-of-four] T_{avg} channels below the setpoint, the P-12 interlock function is to provide MSLI on High Steam Flow in Two Steam Lines Coincident With T_{avg} – Low Low or SI and MSLI on Steam Line Pressure – Low Coincident With T_{avg} – Low Low.] Another P-12 function on decreasing temperature is for the P-12 interlock

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

to automatically reinstate SI and MSLI on Steam Line Pressure-Low or High Steam Flow coincident with Steam Line Pressure-Low and to afford protection

This Function must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to have an accident.

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

ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.2-1.

In the event a channel's Trip Setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument Loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected. When the Required Channels in Table 3.3.2-1 are specified (e.g., on a per steam line, per loop, per SG, etc., basis), then the Condition may be entered separately for each steam line, loop, SG, etc., as appropriate.

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

- REVIEWER'S NOTE -

Certain LCO Completion Times are based on approved topical reports. In order for a licensee to use these times, the licensee must justify the Completion Times as required by the staff Safety Evaluation Report (SER) for the topical report.

A.1

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required

BASES

ACTIONS (continued)

Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, B.2.1 and B.2.2

Condition B applies to manual initiation of:

- SI,
- Containment Spray,
- Phase A Isolation, and
- Phase B Isolation.

This action addresses the train orientation of the SSPS for the functions listed above. If a channel or train is inoperable, 48 hours is allowed to return it to an OPERABLE status. Note that for containment spray and Phase B isolation, failure of one or both channels in one train renders the train inoperable. Condition B, therefore, encompasses both situations. The specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (54 hours total time) and in MODE 5 within an additional 30 hours (84 hours total time). The allowable Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1 and C.2.2

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI,
- Containment Spray,
- Phase A Isolation,

·P-4 Interlock,

BASES

ACTIONS (continued)

- Loss of Offsite Power, and
- Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low, and
- P-4 Interlock.

For the Manual Initiation and the P-4 Interlock Functions, this action addresses the train orientation of the SSPS. For the Loss of Offsite Power Function, this action recognizes the lack of manual trip provision for a failed channel. For the AFW System pump suction transfer channels, this action recognizes that placing a failed channel in trip during operation is not necessarily a conservative action. Spurious trip of this function could align the AFW System to a source that is not immediately capable of supporting pump suction. If a train or channel is inoperable, 48 hours is allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of these Functions, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

G.1, G.2.1 and G.2.2

Condition G applies to the automatic actuation logic and actuation relays for the Steam Line Isolation [,Turbine Trip and Feedwater Isolation,] and AFW actuation Functions.

The action addresses the train orientation of the SSPS and the master and slave relays for these functions. If one train is inoperable, 6 hours are allowed to restore the train to OPERABLE status. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be returned to OPERABLE status, the unit must be brought to MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly

This Condition is applicable when the interlock is inoperable to the extent that an ESFAS Function which should not be blocked in the current MODE is blocked.

BASES

ACTIONS (continued)

L.1, L.2.1 and L.2.2

Condition L applies to the P-11 and P-12 ~~[and P-14]~~ interlocks.

required

With one or more channels inoperable, the operator must verify that the interlock is in the required state for the existing unit condition. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

INSERT 4B

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

- REVIEWER'S NOTE -

Certain Frequencies are based on approved topical reports. In order for a licensee to use these times, the licensee must justify the Frequencies as required by the staff SER for the topical report.

SR 3.3.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a

INSERT 4B

Condition M applies to the automatic actuation logic and actuation relays for the P-4, P-11 and P-12 interlocks. This Condition is applicable when the interlock is inoperable to that extent that an ESFAS Function which should not be blocked in the current MODE is blocked.

With one train inoperable, the operator must verify that the interlock is in the required state for the existing unit condition. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the interlock must be restored to OPERABLE status within 6 hours, or the unit must be placed in MODE 3 within the next 6 hours and MODE 5 within the following 30 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 5 removes all requirements for OPERABILITY of these interlocks and the automatic actuation logic, SI actuation relays and interlock actuation relays.

This Condition is intended to address an inoperability of the actuation logic or relays associated with a given train which affects the integrated ESFAS response to a pressurizer pressure low SI (P-11), steam line low pressure SI/MSLI (P-11 or P-12), High Steam Flow Coincident With Steam Line Pressure – Low or Coincident With T_{avg} – Low Low (P-12), or any auto SI (P-4) actuation signal. The relatively short Completion Time of this action (6 hours) is based on the fact that multiple ESF components (systems or equipment) within a train are affected by the failure of the actuation logic or relays. This Condition is applicable whenever more than one ESF System is affected by the inoperable train of logic or relays. However, if one or more inoperable actuation relay(s) in a train affect only a single ESF System, then the ACTIONS Condition of the LCO applicable to the affected ESF component or system should be entered and this Condition is not applicable.

This action addresses the train orientation of the SSPS and the master and slave relays. If one train is inoperable, 6 hours are allowed to restore the train to OPERABLE status. The specified Completion Time is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (12 hours total time) and in MODE 5 within an additional 30 hours (42 hours total time). The Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

The Required Actions are modified by a Note that allows one train to be bypassed for up to [4] hours for surveillance testing, provided the other train is OPERABLE. This allowance is based on the reliability analysis (Ref. 8) assumption that 4 hours is the average time required to perform channel surveillance.

BASES

SURVEILLANCE REQUIREMENTS (continued)

similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested every 31 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

and permissive

SR 3.3.2.3

SR 3.3.2.3 is the performance of an ACTUATION LOGIC TEST as described in SR 3.3.2.2, except that the semiautomatic tester is not used and the continuity check does not have to be performed, as explained in the Note. This SR is applied to the balance of plant actuation logic and relays that do not have the SSPS test circuits installed to utilize the semiautomatic tester or perform the continuity check. This test is also

BASES

SURVEILLANCE REQUIREMENTS (continued)

performed every 31 days on a STAGGERED TEST BASIS. The Frequency is adequate based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The time allowed for the testing (4 hours) and the surveillance interval are justified in Reference 8.

SR 3.3.2.5

SR 3.3.2.5 is the performance of a COT.

With the exception of P-11, the COT also confirms the channel inputs to both actuation logic trains. The P-11 inputs are tested on an 18 month basis under SR 3.3.2.7.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis (Ref. 8) when applicable.

The Frequency of 92 days is justified in Reference 8.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.6

SR 3.3.2.6 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function, or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is adequate, based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a TADOT every [92] days. This test is a check of the Loss of Offsite Power, Undervoltage RCP, and AFW Pump Suction Transfer on Suction Pressure - Low Functions. Each Function is tested up to, and including, the master transfer relay coils. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The test also includes trip devices that provide actuation signals directly to the SSPS. The SR is modified by a Note that excludes verification of setpoints for relays. Relay setpoints require elaborate bench calibration and are verified during CHANNEL CALIBRATION. The Frequency is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.2.8

and the P-4 interlock Function, including turbine trip, automatic SI block, and seal-in of feedwater isolation by SI

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. It is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of

The turbine trip by reactor trip (P-4) is independently verified for both trains.

BASES

SURVEILLANCE REQUIREMENTS (continued)

and allows testing to be performed during shutdowns when necessary. However, the P-4 input signals to SSPS actuation logic are normally tested in conjunction with RTB testing under SR 3.3.1.4 on a 31-day STAGGERED TEST BASIS.

the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

or interlock

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

The Frequency of [18] months is based on the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.10

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis. Response Time testing acceptance criteria are included in the Technical Requirements Manual, Section 15 (Ref. 9). Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter

BASES

SURVEILLANCE REQUIREMENTS (continued)

response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

ESF RESPONSE TIME tests are conducted on an [18] month STAGGERED TEST BASIS. Testing of the final actuation devices, which make up the bulk of the response time, is included in the testing of each channel. The final actuation device in one train is tested with each channel. Therefore, staggered testing results in response time verification of these devices every [18] months. The [18] month Frequency is consistent with the typical refueling cycle and is based on unit operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

This SR is modified by a Note that clarifies that the turbine driven AFW pump is tested within 24 hours after reaching [1000] psig in the SGs.

SR 3.3.2.11

SR 3.3.2.11 is the performance of a TADOT as described in SR 3.3.2.8, except that it is performed for the P-4 Reactor Trip Interlock, and the Frequency is once per RTB cycle. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This Frequency is based on operating experience demonstrating that undetected failure of the P-4 interlock sometimes occurs when the RTB is cycled.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

REFERENCES

1. FSAR, Chapter [6].

2. FSAR, Chapter [7].

3. FSAR, Chapter [15].

4. IEEE-279-1971.