Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

May 30, 2001
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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
License Amendment Request –
Proposed Revision to Reactor Trip System and Engineered Safety Features
Actuation System Allowed Outage Times and Bypass Test Times

STP Nuclear Operating Company (STPNOC) submits the attached proposed amendment to South Texas Project Operating Licenses NPF-76 and NPF-80. The proposed change will permit relaxation of the allowed outage times and bypass test times for Limiting Conditions for Operations 3.3.1, "Reactor Trip System Instrumentation," and 3.3.2, "Engineered Safety Features Actuation System Instrumentation."

STPNOC requests approval of the proposed amendment by February 28, 2002. Once approved, the amendment shall be implemented within 30 days.

As part of the implementation of the proposed license amendment, STP commits to add solid state protection system train and engineered safety feature actuation system train unavailability to the Configuration Risk Management Program.

The South Texas Project Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed and approved the proposed change.

In accordance with 10 CFR 50.91(b), South Texas Project is providing the State of Texas with a copy of this proposed amendment change.

A001

If you have any questions concerning this matter, please contact Mr. J. R. Morris at (361) 972-8652 or me at (361) 972-8434.

J. J. Sheppard
Vice President,
Engineering &
Technical Services

Attachments

Attachment 1	Affidavit
Attachment 2	Change Description and Safety Analysis
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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

ATTACHMENT 1

AFFIDAVIT

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
STP Nuclear Operating Company	)	Docket Nos. 50-498
	)	50-499
South Texas Project Units 1 and 2	)	

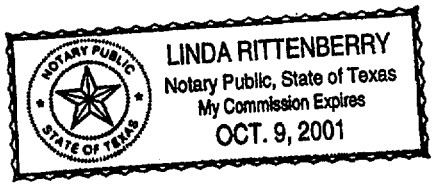
AFFIDAVIT

I, J. J. Sheppard, being duly sworn, hereby depose and say that I am Vice President, Engineering & Technical Services of STP Nuclear Operating Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached proposed amendment to South Texas Project Operating Licenses NPF-76 and NPF-80; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

J. J. Sheppard
Vice President,
Engineering &
Technical Services

STATE OF TEXAS	)	
	)	
COUNTY OF MATAGORDA	)	

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 30th day of May, 2001.



Linda Rittenberry
Notary Public in and for the
State of Texas

ATTACHMENT 2

CHANGE DESCRIPTION AND SAFETY ANALYSIS

CHANGE DESCRIPTION AND SAFETY ANALYSIS

1.0 INTRODUCTION

1.1 The proposed change will permit relaxation of the allowed outage times and bypass test times for Limiting Conditions for Operations 3.3.1, "Reactor Trip System Instrumentation," and 3.3.2, "Engineered Safety Features Actuation System Instrumentation."

1.2 ANNOTATED CHANGES TO THE EXISTING TECHNICAL SPECIFICATIONS AND BASES

Units 1 and 2 See Attachment 6

1.3 PROPOSED CHANGES INCORPORATED INTO THE TECHNICAL SPECIFICATIONS

Units 1 and 2 See Attachment 7

1.4 UPDATED FINAL SAFETY ANALYSIS REPORT (UFSAR) SECTION

There are no changes to the UFSAR currently anticipated as a result of the proposed license amendment. Changes to the STP UFSAR required as a result of the installation of the bypass testing instrumentation modification will be performed in accordance with the requirements of 10CFR50.59.

2.0 DESCRIPTION

Description of Amendment Request

The proposed change will permit relaxation of the allowed outage times and bypass test times for Limiting Conditions for Operations 3.3.1, "Reactor Trip System (RTS) Instrumentation," and 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation." These relaxations are those that are generically approved in WCAP-14333-P-A, Revision 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times." The following table summarizes the proposed changes:

Technical Specification Parameter	Current Parameter Value (hours)	Proposed Parameter Value (hours)
RTS & ESFAS Instrumentation (analog channels) - Bypass Test Time - Allowed Outage Time	 4 1 or 6	 12 72
Automatic Actuation Logic and Actuation Relays	Current Specifications require shutdown to Mode 3 within 6 hours	24 hours allowed outage time, followed by 6 hours to shutdown to Mode 3

A detailed summary of changes proposed by this amendment request is provided in Attachment 3.

No modifications to setpoint actuations, trip setpoint, surveillance requirements or channel response that would affect the safety analyses are associated with this change. Hardware changes necessary to be made to the Nuclear Instrumentation System (NIS) and 7300 Process Protection System to facilitate testing in bypass will be implemented in accordance with 10 CFR 50.59. The hardware modifications to facilitate testing in bypass meet the conditions specified by the NRC Staff in the Safety Evaluation Reports issued during the review of WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," and its supplements.

3.0 BACKGROUND

Description of Reactor Trip System and Engineered Safety Features Actuation System

The Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) utilize 1-out-of-2, 2-out-of-3 and 2-out-of-4 coincidence logic from redundant channels to initiate protective actions. Within these systems, analog channel

comparators, with the exception of Nuclear Instrumentation System (NIS) 1-out-of-2 functions and the ESFAS containment spray function, are currently placed in the tripped state for channel testing or in response to a channel being out of service. With an inoperable channel in the tripped state, maintenance or testing cannot be performed on a redundant channel unless one of the channels is bypassed. In addition, with a channel in the tripped condition, a second comparator trip in a redundant channel caused by human error, a spurious transient, or channel failure would initiate a reactor trip or safeguards actuation.

The bypass test instrumentation modification, currently scheduled for installation in each unit's next refueling outage, will introduce bypass circuitry for NIS functions and the 7300 Process Protection System reactor trip functions and ESF functions. With the implementation of test in bypass, the spurious reactor trip or safeguards actuation will be avoided since the partial trip conditions that would have been present are eliminated, and the logic requiring signals from two additional channels to actuate the protective function is maintained. This provides the benefits of reducing challenges to the plant safety systems that may result from spurious actuations and thus potentially increasing plant availability. Administrative controls will be provided to prevent the simultaneous bypassing of more than one redundant protection set at any one time, and to restore the system to normal operation.

Hardware modifications will be made to both the NIS and 7300 systems to ensure that test in bypass may be accomplished without lifting leads or installing temporary jumpers. A bypass panel will be installed in the NIS to provide a second source of 118 VAC power in place of the output of a bistable function. The modification of the 7300 System involves replacing the existing test cards with new cards designed to provide the test in bypass capability. These modifications will be made in accordance with the requirements of 10 CFR 50.59.

Status of the bypassed condition will be provided both in the control room and locally. Both systems will retain the ability to test with the function in partial trip. The design has also considered fault conditions, qualification, reliability and credible failures. The systems are designed such that credible failures will not result in a function being automatically placed in a bypassed condition.

In accordance with the surveillance provisions of the Technical Specifications, periodic analog channel operational tests (ACOTs) will be performed. The ACOTs will include adjustments, as necessary, of the alarm, interlock, and/or trip setpoints such that the setpoints are within the required range and accuracy. However, with the regulatory approval of the Technical Specification changes proposed in this submittal, the ACOT may be performed in a bypassed condition. It is implicit that the associated solid state protection system (SSPS) input relay not be cycled, which would result in a partial trip of the logic. Testing of the entire protection channel including SSPS input relay trip

functions will be performed on a Refueling (18-month) periodicity. This refueling periodicity testing will verify operability of the SSPS input relays and provide assurance that there are no failures that would prevent the actuation of a required trip function. The ACOT will continue to include adjustments, as described above, to ensure that the interlock and trip setpoints are within Technical Specification required limits. This implicit change regarding testing of the input relays on a refueling periodicity rather than as part of the ACOT is comparable to a similar bypass testing instrumentation related amendment to the Vogtle Electric Generating Plant Technical Specifications (Amendments 67 [Unit 1] and 46 [Unit 2]), which was approved on September 30, 1993. Although no changes were made to the Vogtle Technical Specifications which explicitly described testing of input relays, South Texas Project proposes to add a note to the associated surveillance requirements tables, which states that input relays will be tested on a refueling (18-month) periodicity.

Background Related to the WCAPs Supporting the Proposed Amendment

In response to concerns related to the impact of current testing and maintenance requirements on plant operation, particularly as related to instrumentation systems, the Westinghouse Owners' Group (WOG) initiated a program to develop a justification for testing in bypass to be used to revise generic and plant-specific instrumentation Technical Specifications. Operating plants have experienced inadvertent reactor trips and safeguards actuations during performance of instrumentation surveillances, causing unnecessary transients and challenges to safety systems. The significance of testing in bypass, rather than partial trip, was evaluated along with revisions to surveillance test intervals (STIs) and allowed outage times (AOTs). The determination was that all were achievable without compromising plant safety.

The initial issue of WCAP-10271 and its Supplement 1 addressed the potential relaxations for the reactor trip system (RTS) while later supplements addressed the potential relaxations for the engineered safety features actuation system (ESFAS). The NRC issued the Safety Evaluation Report (SER) for WCAP-10271 and Supplement 1, which address RTS instrumentation, in their letter dated February 21, 1985. In addition to approving quarterly testing, 6 hours to place an inoperable channel in a tripped mode and increased AOTs for testing in bypass from 2 to 4 hours (all of which have been implemented at STP Units 1 and 2), this SER approved testing in bypass for analog channels of the RTS, and increased the AOT for an inoperable actuation logic and relay channel from 1 to 6 hours. Subsequently, the NRC issued the SER for WCAP-10271 Supplement 2 and Supplement 2 Revision 1, which address ESFAS instrumentation, in their letter dated February 22, 1989. This SER approved quarterly testing (implemented at STP), 6 hours to place an inoperable channel in a tripped mode, increased AOTs for testing in bypass from 2 to 4 hours, and an increased AOT for actuation logic and relays for analog channels of the ESFAS.

In WCAP-10271 and its supplements, the WOG evaluated the impact of the proposed STI, AOT and bypass testing changes on core damage frequency (CDF) and public risk. The NRC Staff concluded with the issuance of the SERs and SSER that an overall upper bound of the CDF increase, due to the proposed changes, is less than 6 percent for Westinghouse PWRs. The NRC also concluded that actual CDF increases for individual plants are expected to be substantially less than 6 percent. The NRC considered this CDF increase to be small compared to the range of uncertainty in the CDF analyses and therefore acceptable. The WOG program was based on a typical Westinghouse four-loop plant design and therefore the results are applicable and bounding for STP Units 1 and 2 with regard to the analog channel changes.

4.0 TECHNICAL ANALYSIS

WCAP-14333-P-A, Revision 1 provides the technical basis and methodology for extending the allowed outage times and bypass test times listed above. A risk-informed approach was used to justify these changes. The approach is consistent with that recommended by the Nuclear Regulatory Commission in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." The impact of the proposed test time and allowed outage time changes on core damage frequency, incremental core damage probability, and large early release frequency was assessed by the WCAP. The results of the risk evaluation demonstrated that the results conform to the acceptance guidelines provided in Regulatory Guides 1.174 and 1.177. Specifically:

- The impact of the changes on core damage frequency is approximately 1.0E-06/year.
- The impact of the changes on large early release frequency is less than 1.0E-07/year.
- The incremental conditional core damage probabilities for each test and maintenance configuration is less than 5.0E-07.

Furthermore, additional analyses performed by Westinghouse in response to a Request for Additional Information issued for a Southern Nuclear Company license amendment request demonstrated generically for all Westinghouse Owners Group plants that the incremental conditional large early release probabilities associated with the AOT and bypass test times specified in WCAP-14333 are less than 5.0E-08 (Reference 7).

The applicability of the WCAP-14333 analyses to STP are demonstrated in Attachment 4.

One set of changes proposed in this amendment request relaxes the required actions for inoperable actuation logic and relays from the current requirement to be in Mode 3 within 6 hours (i.e., no allowed outage time) to a 24-hour allowed outage time period plus an additional 6 hours to be in Mode 3. WCAP-10271 and NUREG-1431, "Improved

Standard Technical Specifications – Westinghouse Plants", generically relaxed the allowed outage time for inoperable actuation logic and relays to 6 hours plus an additional 6 hours to be in Mode 3, which has not been implemented at STP, and WCAP-14333 provides the additional justification to extend the allowed outage time to 24 hours.

The impact of increased allowed outage times and bypass test times should result in an overall improvement in safety by reducing the potential for spurious reactor trips and spurious actuation of safety equipment. The longer allowed outage times and bypass test times proposed in this amendment request will provide additional time before being required to place the associated channel in trip. With the channel in trip, the logic required to cause a reactor trip or safety system actuation is reduced to 1-out-of-2 (for 2-out-of-3 logic) and 1-out-of-3 (for 2-out-of-4 logic). With one channel tripped, the potential for a spurious actuation is increased. Placing a channel in bypass for additional time does reduce the availability of signals to initiate component actuation for event mitigation when required, but as shown in WCAP-14333, the impact on safety is small due to the availability of other signals or operator action to trip the reactor or cause component actuation. Therefore, these proposed changes should reduce the potential for inadvertent reactor trips and inadvertent equipment actuations due to human error or spurious actuation.

5.0 REGULATORY ANALYSIS

5.1 NO SIGNIFICANT HAZARDS DETERMINATION

Pursuant to 10 CFR 50.92, it has been determined that this request involves no significant hazards considerations. The determination of no significant hazards was made by applying the Nuclear Regulatory Commission established standards contained in 10 CFR 50.92. These standards assure that any changes to the operation of South Texas Project in accordance with this request consider the following:

1) Will the change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The reactor protection and engineered safety features functions are not initiators of any design basis accident or event and therefore the proposed changes do not increase the probability of any accident previously evaluated. The proposed changes to the allowed outage and bypass test times have an insignificant impact on plant safety based on the calculated core damage frequency increase being approximately 1.0E-06. Therefore, the proposed changes do not result in a significant increase in the consequences of an accident previously evaluated.

2) Will the change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes do not result in a change in the manner in which the Reactor Trip System (RTS) and Engineered Safety Features Actuation System (ESFAS) provide plant protection. The existing RTS and ESFAS actuation setpoints will be unaffected by these proposed changes. The changes to the allowed outage and bypass test times do not change any existing accident scenarios nor create any new or different accident scenarios. Therefore, this request does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3) Will the change involve a significant reduction in a margin of safety?

Response: No

The proposed changes do not alter the manner in which safety limits, limiting safety system settings or limiting conditions for operation are determined. The impact of increased allowed outage times and bypass test times should result in an overall improvement in safety by reducing the potential for spurious reactor trips and spurious actuation of safety equipment. The longer allowed outage times and bypass test times will provide additional time before being required to place the associated channel in trip. With the channel in trip, the logic required to cause a reactor trip or safety system actuation is reduced to 1-out-of-2 (for 2-out-of-3 logic) and 1-out-of-3 (for 2-out-of-4 logic). With one channel tripped, the potential for a spurious actuation is increased. Placing a channel in bypass for additional time does reduce the availability of signals to initiate component actuation for event mitigation when required, but as shown in WCAP-14333, the impact on safety is small due to the availability of other signals or operator action to trip the reactor or cause component actuation. Therefore, these proposed changes should reduce the potential for inadvertent reactor trips and inadvertent equipment actuations due to human error or spurious actuation, and will not involve a significant reduction in the margin of safety.

Conclusion

Based upon the analysis provided herein, the proposed amendments will not increase the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a reduction in a margin of safety. Therefore, the proposed amendments meet the requirements of 10 CFR 50.92 and do not involve a significant hazards consideration.

5.2 REGULATORY SAFETY ANALYSIS

Current Applicable Regulatory Requirements/Criteria

Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"

Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications"

Analysis

WCAP-14333-P-A, Revision 1 provides the technical basis and methodology for extending the allowed outage times and bypass test times listed above. A risk-informed approach was used to justify these changes. The approach is consistent with that recommended by the Nuclear Regulatory Commission in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications."

The approach provides an evaluation of the impact on plant risk that uses the three-tiered approach as presented by the Commission in Regulatory Guide 1.177. Tier 1, PRA Capability and Insights, assessed the impact of the proposed test time and allowed outage time changes on core damage frequency, incremental conditional core damage probability, and large early release frequency. Tier 2, Avoidance of Risk-Significant Plant Configurations, considered potential risk-significant plant operating configurations. Tier 3, Risk-Informed Plant Configuration Control and Management, considers risk evaluations of configurations when entered. At STP, the Tier 3 requirement is addressed by the Configuration Risk Management Program, as discussed in Section 6.8.3.k of the STP Technical Specifications.

The Configuration Risk Management Program was incorporated into the South Texas Project Technical Specifications via amendments 85 (Unit 1) and 72 (Unit 2), issued on October 31, 1996. These amendments approved an extended allowed outage time of 14 days for the standby diesel generators, and an extended allowed outage time of 7 days for

the Essential Cooling Water and Essential Chilled Water systems. In the Safety Evaluation for amendments 85 and 72, the NRC Staff concluded that STP had "provided the necessary assurances that appropriate assessments of the overall impacts on safety functions will be performed prior to any maintenance or other operational activities, including removal of equipment from service".

The NRC Safety Evaluation for WCAP-14333-P concludes that "the risk analysis in WCAP-14333-P supports the proposed TS changes and is acceptable, subject to the following conditions which must be addressed in referencing licensee's plant-specific license amendment requests:

1. Confirm the applicability of the WCAP-14333-P analyses for their plant.
2. Address the Tier 2 and Tier 3 analyses including the CRMP (Configuration Risk Management Program) insights, by confirming that these insights are incorporated into the referenced licensee's decision making process before taking equipment out of service."

The requirements for the above conditions are addressed in Attachments 4 and 5. Attachment 4 discusses the applicability of the WCAP-14333 analyses to the South Texas Project. Attachment 5 addresses the Tier 2 and 3 requirements. The purpose of the Tier 2 requirements is to ensure the plant risk does not increase to unacceptable levels if multiple components are out of service simultaneously. The STP Tier 2 analyses demonstrate that the change in core damage frequency is approximately 1.6E-07 per year for placing an analog instrumentation channel in bypass.

Discrepancy in Application of WCAP-10271 identified by Dominion Energy

In a recent INPO Operating Experience Report (OE11900), an issue was identified at Dominion Energy's Surry Station, in which it was determined that the allowed outage times (AOTs) and surveillance intervals for some RPS and ESFAS instrumentation were previously changed and approved in the plant's Technical Specifications without a documented risk basis. This discrepancy resulted from the misapplication of WCAP-10271 Supplement 1 and Supplement 2. The TS marked-up pages provided in the WCAPs and the associated NRC Safety Evaluation Reports (SER) included the AOT and bypass allowance for certain instruments that were not addressed by the probabilistic risk assessment. As a result, WCAP-10271 Supplements 1 and 2 were erroneously identified as the basis for extending the AOT and surveillance interval for certain instrumentation for a previous change to the Surry TSs. The OE Report also states that some of the WCAP-14333 text, including the marked-up pages, can be confusing and may result in a licensee using the WCAP as a basis for extending the AOT and bypass time for functional units that are not addressed by the probabilistic risk assessment.

The RTS and ESFAS Functions that were evaluated in WCAPs-10271 and -14333 were the functions that were generic to all Westinghouse SSPS and RPS plant protection system designs. The specific RTS and ESFAS Functions evaluated in these two WCAPs are contained in Table 3.2-2 (Solid State Protection System (SSPS)) and Table 3.2-3 (Relay Protection System (RPS)) of WCAP-10271, Supplement 1-P-A, and Table 3.1-3 (SSPS) and Table 3.1-2 (RPS) in WCAP-10271-P-A, Supplement 2, Rev. 1.

Plant-specific RTS and ESFAS functions that are not contained in these WCAP tables were not evaluated generically in the technical justifications supporting WCAP-10271 and WCAP-14333. A comparison of WCAP-10271, WCAP-14333, and NUREG-1431 identified the following three Functions that were not evaluated in WCAP-10271:

- Reactor Coolant Pump Breaker Position (Single Loop and Two Loops)

  [The STP design does not include this trip feature as part of the Reactor Trip System, and therefore is not applicable to STP]

- Automatic Switchover to Containment Sump (RWST Level - Low Low Coincident with Safety Injection and RWST Level - Low Low Coincident with Safety Injection and Coincident with Containment Sump Level - High)

  [STP TS 3.3.2 Functional Unit 7 – This STP functional unit is of a different design than the RTS and ESFAS circuitry evaluated in the subject WCAPs, and currently has a 48 hour AOT. No changes are proposed in this amendment regarding this Functional Unit.]

- Loss of Power Function

  [STP TS 3.3.2 Functional Unit 8 - STP has evaluated the change to the Loss of Power Functional Unit and has determined that relaxation of the AOT and bypass test times is justified. The standby diesel generator start signals on low bus voltage are two-out-of-four logic for each bus. With a single instrument loop bypassed, the logic is effectively two-out-of-three, which could increase the likelihood of signal failure to approximately 8.6E-06 with no operator action. Because the likelihood of diesel generator failure for all causes is approximately 8E-02, the small change in signal unavailability does not affect the diesel generator automatic start on loss of power to its associated bus.]

Conclusion

The proposed changes are consistent with the analyses detailed in WCAP-10271 (and its supplements) and WCAP-14333-P-A, and comply with the conditions for implementation established in the associated NRC Safety Evaluation Report.

6.0 ENVIRONMENTAL EVALUATION

Pursuant to 10 CFR 51.22, an evaluation of this request has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (10) of the regulations.

This request will have no adverse radiation impact upon the environment. It has been determined that the proposed changes involve:

1. No significant hazards consideration,

2. No significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite, and

3. No significant increase in individual or cumulative occupational radiation exposures.

Therefore, this request for revision of the Facility Operating Licenses meets the criteria of 10 CFR 51.22 for categorical exclusion from the requirement for an environmental assessment.

7.0 REFERENCES

1. Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis"

2. Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications"

3. WCAP-10271-P-A, and associated Supplement 1, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System

4. WCAP-10271-P-A Supplement 2, and Supplement 2 Revision 1, "Evaluation of Surveillance Frequencies and Out of Service Times for the Engineered Safety Features Actuation System

5. WCAP-14333-P-A, Revision 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times"

6. Letter, K.J. Vavrek, Westinghouse, to Westinghouse Owners Group Licensing Subcommittee Representatives, "Implementation Guideline for WCAP-14333-P-A, Rev. 1 (Proprietary), "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times" (MUHP-3054), Dated December 2, 1998

7. Letter, K.J. Vavrek, Westinghouse, to Westinghouse Owners Group Licensing Subcommittee Representatives, "Calculation of Incremental Conditional Large Early Release Probability in Support of Utility Implementation of WCAP-14333" (MUHP-3055), Dated May 8, 2000

8.0 PRECEDENTS

Southern Nuclear Company submitted a similar license amendment request based on WCAP 14333-P-A, Revision 1, for the Vogtle Electric Generating Plant in a letter to the Commission dated October 13, 1999. Southern Nuclear supplemented this submittal in a letter dated June 1, 2000. The NRC subsequently issued amendments 116 and 94 to Facility Operating Licenses NPF-68 and -81, respectively for Vogtle Units 1 and 2, on December 22, 2000.

ATTACHMENT 3

DETAILED SUMMARY OF PROPOSED CHANGES

DETAILED SUMMARY OF PROPOSED CHANGES

The table below provides a detailed summary of the changes proposed by this license amendment request.

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
Table 3.3-1	3/4 3-3, 3/4 3-6	Deleted Table Note 1. [Functional Unit 14]	Table Note 1 was required due to the differences in Applicable Modes and AOTs between Tables 3.3-1 and 3.3-3 for the Steam Generator Low-Low Level Functional Unit. However, the proposed changes will make the applicable Modes and Action Statements the same for this functional unit. Therefore, the note and its corresponding references are no longer required and are being deleted.
Table 3.3-1	3/4 3-4, 3/4 3-5, 3/4 3-8	Created Action 9A and revised corresponding reference in Table 3.3-1. [Functional Units 18 and 21]	In the current TS, Functional Units 18, 20 and 21 each refer to Action 9. However, since the proposed changes only affect Functional Units 18 and 21, a new Action 9A was created for these Functional Units. Functional Unit 20 will continue to refer to Action 9.
Table 3.3-1, ACTION 2	3/4 3-6	Action 2 is revised to increase the time to place a channel in trip from 6 to 72 hours, and increase the time a channel may be bypassed from 4 to 12 hours. Furthermore, Action 2 is divided into two substeps; one that addresses Functional Units with installed bypass test capability, and one without.	This change is supported by WCAP-14333. Because one operating unit is scheduled to have installed bypass test capability in place before it is installed in the other operating unit, two separate substeps are required.

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
		[Functional Units 2 and 3]	
Table 3.3-1, ACTION 6	3/4 3-7	Action 6 is revised to increase the time to place a channel in trip from 6 to 72 hours, and increase the time a channel may be bypassed from 4 to 12 hours. Furthermore, Action 6 is divided into two substeps; one that addresses Functional Units with installed bypass test capability, and one without. [Functional Units 8 through 17]	This change is supported by WCAP-14333. Because one operating unit is scheduled to have installed bypass test capability in place before it is installed in the other operating unit, two separate substeps are required.
Table 3.3-1, ACTION 9A	3/4 3-8	Action 9A is created to establish a 24-hour allowed outage time followed by 6 hours to place the unit in HOT STANDBY, and increase the bypass test time from 2 to 4 hours. [Functional Units 18 and 21]	The current action for these specifications has no allowed outage time, but rather requires the unit be placed in hot standby within 6 hours. WCAP-10271 and NUREG-1431 established a 6-hour allowed outage time for these functional units (followed by 6 hours to reach hot standby), and increased the bypass test time from 2 to 4 hours. The analyses provided in WCAP-14333 further increased the allowed outage time to 24 hours.
Table 4.3-1, Note 19	3/4 3-11, 3/4 3-12, 3/4 3-13, 3/4 3-15	Note 19 is added to clarify that for channels with bypass test instrumentation, the associated input relays are tested on an 18-month frequency.	For channels with bypass test instrumentation, testing of input relays will no longer be performed with the ACOT (which will be performed with the channel in bypass), since this would trip the associated bistable. Consistent with a similar license amendment for Vogtle, input relays would be

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
			tested on an 18-month (Refueling) frequency. Although Vogtle's license amendment did not include any changes to the Specifications to reflect this change to the testing of input relays, STP proposes to include Note 19 to Table 4.3-1 to clarify this requirement.
Table 3.3-3	3/4 3-18, 3/4 3-21, 3/4 3-26	Deleted Action 15 and changed Action required from Action 15 to Action 20, for associated Functional Units. [Functional Units 1.d, 1.f, 4.c, 4.d, and 4.e]	Action 15, if revised to be consistent with WCAP-14333 allowed outage time and bypass test time for these functional units, would have been identical to Action 20. Therefore, Action 15 is deleted, and the required action is changed to Action 20, in order to avoid redundancy.
Table 3.3-3, ACTION 14	3/4 3-26	Action 14 is revised to establish a 24-hour allowed outage time followed by 6 hours to place the unit in HOT STANDBY, and increase the bypass test time from 2 to 4 hours. [Functional Units 1.b, 1.c, 2.b, 2.c, 3.a.2, 3.a.3, 3.c.1, and 3.c.2]	The current action for these specifications has no allowed outage time, but rather requires the unit be placed in hot standby within 6 hours. WCAP-10271 and NUREG-1431 established a 6-hour allowed outage time for these functional units (followed by 6 hours to reach hot standby), and increased the bypass test time from 2 to 4 hours. The analyses provided in WCAP-14333 further increased the allowed outage time to 24 hours.
Table 3.3-3, ACTION 15	3/4 3-26	Action 15 is deleted as noted above. [Functional Units 1.d, 1.f, 4.c, 4.d, and 4.e]	As noted above.

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
Table 3.3-3, ACTION 17	3/4 3-26	Action 17 is revised to establish a 72-hour time limit to place a channel in bypass, and establishes a time limit to place the unit in Hot Standby and Hot Shutdown, if the channel is not returned to Operable or bypassed within the 72 hours. Also, the time a channel may be bypassed is increased from 2 to 12 hours. [Functional Units 2.d and 3.c.3]	Action 17 currently permits continued operation provided the channel is placed in bypass. NUREG-1431 and WCAP-10271 established a 6-hour time limit to place a channel in trip as well as establishing time limits to place the unit in lower operation modes if the channel was not bypassed or returned to operable status. The analyses provided in WCAP-14333 extended the time to place a channel in bypass from 6 to 72 hours.
Table 3.3-3, ACTION 20	3/4 3-27	Action 20 is revised to extend the time to place a channel in trip from 1 hour to 72 hours, and increases the time a channel may be in bypass for surveillance testing from 2 to 12 hours. Furthermore, Action 20 is divided into two substeps; one that addresses Functional Units with installed bypass test capability, and one without. [Functional Units 1.d, 1.e, 1.f, 4.c, 4.d, 5.b, 5.f, 6.d, 8.a, 8.b, and 8.c]	Current Specifications require that an inoperable channel be placed in trip within 1 hour, and allow a channel to be in bypass for surveillance testing for 2 hours. NUREG-1431 and WCAP-10271 increased the time limit to place a channel in trip from 1 to 6 hours, and increased the time to be in bypass for surveillance testing from 2 to 4 hours. WCAP-14333 analyses further increased the time to place a channel in trip to 72 hours, and the time in bypass for surveillance testing to 12 hours. Because one operating unit is scheduled to have installed bypass test capability in place before it is installed in the other operating unit, two separate substeps are required.
Table 3.3-3, ACTION 22	3/4 3-27	Action 22 is revised to establish a 24-hour allowed outage time (followed by 6 hours to place the	The current action for these specifications has no allowed outage time, but rather requires

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
		unit in HOT STANDBY, and 6 additional hours to place the unit in HOT SHUTDOWN), and increase the bypass test time from 2 to 4 hours. [Functional Units 4.b, 6.b, and 6.c]	the unit be placed in hot standby within 6 hours, and 6 additional hours to place the unit in hot shutdown. WCAP-10271 and NUREG-1431 established a 6-hour allowed outage time for these functional units (followed by 6 hours to reach hot standby), and increased the bypass test time from 2 to 4 hours. The analyses provided in WCAP-14333 further increased the allowed outage time to 24 hours.
Table 3.3-3, ACTION 25	3/4 3-27	Action 25 is revised to establish a 24-hour allowed outage time followed by 6 hours to place the unit in HOT STANDBY, and increase the bypass test time from 2 to 4 hours. [Functional Unit 5.a]	The current action for these specifications has no allowed outage time, but rather requires the unit be placed in hot standby within 6 hours. WCAP-10271 and NUREG-1431 established a 6-hour allowed outage time for these functional units (followed by 6 hours to reach hot standby), and increased the bypass test time from 2 to 4 hours. The analyses provided in WCAP-14333 further increased the allowed outage time to 24 hours.
Table 4.3-2, Note 7	3/4 3-42 through 3/4 3-49	Note 7 is added to clarify that for channels with bypass test instrumentation, the associated input relays are tested on an 18-month frequency.	For channels with bypass test instrumentation, input relays will no longer be performed with the ACOT (which will be performed with the channel in bypass), since this would trip the associated bistable. Consistent with a similar license amendment for Vogtle, input relays would be tested on an 18-month (Refueling) frequency. Although Vogtle's license amendment did

TS Section	TS Page	Proposed Change	Explanation of Change / Justification
			not include any changes to the Specifications to reflect this change to the testing of input relays, STP proposes to include Note 19 to Table 4.3-1 to clarify this requirement.

ATTACHMENT 4

APPLICABILITY OF WCAP-14333-P ANALYSES TO STP

APPLICABILITY OF WCAP-14333-P ANALYSES TO STP

In accordance with the guidance provided in Letter WOG-98-245, "Implementation Guideline for WCAP-14333-P-A, Rev. 1 (Proprietary), "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," dated December 2, 1998, the information provided in the attached tables demonstrates the applicability of the generic WCAP-14333 analysis to the South Texas Project.

These tables list the important parameters and assumptions made in the generic analysis that are relevant to the AOT evaluation. Information is also provided on the STP's current calculated core damage frequency (CDF), the CDF reported to the NRC from the Individual Plant Examination (IPE, Generic Letter 88-20), and the contribution to CDF from ATWS events.

Table 1
WCAP-14333 Implementation Guidelines: Applicability of the Analysis
General Parameters

Parameter	WCAP-14333 Analysis Assumptions	STP Plant Specific Parameter
Logic Cabinet Type [1]	Relay and SSPS	SSPS
Component Test Intervals [2]		
• Analog channels	3 months	3 months
• Logic cabinets (SSPS)	2 months	3 months
• Logic cabinets (Relay)	1 month	N/A
• Master Relays (SSPS)	2 months	3 months
• Master Relays (Relay)	1 month	N/A
• Slave Relays	3 months	3 months
• Reactor trip breakers	2 months	3 months
Analog Channel Calibrations [3]		
• Done at-power	yes	No
• Interval	18 months	18 months
Typical At-Power Maintenance Intervals [4]		
• Analog channels	24 months	24 months
• Logic cabinets (SSPS)	18 months	18 months
• Logic cabinets (Relay)	12 months	N/A
• Master relays (SSPS)	infrequent [5]	infrequent
• Master relays (Relay)	infrequent [5]	N/A
• Slave relays	infrequent [5]	infrequent
• Reactor trip breakers	12 months	18 months
AMSAC [6]	Credited for AFW pump start	Yes
Total Transient Event Frequency [7]	3.6	2.9 events/calendar year
ATWS Contribution to CDF (current PRA model) [8]	8.4E-06	6.8E-07 events/reactor year
Total CDF from Internal Events (current PRA model) [9]	5.8E-05	1.2E-05 events/reactor year
Total CDF from Internal Events (IPE) [10]	Not Applicable	4.4E-05 events/reactor year

Table 1 (Continued)
WCAP-14333 Implementation Guidelines: Applicability of the Analysis
General Parameters

Table Notes

1. The analysis is applicable to STP because both types of cabinet are supported by WCAP-14333.
2. STP test intervals are equal to or greater than those used in WCAP-14333, therefore the analysis is applicable to STP. Per STP Technical Specifications, testing of Master Relays may increase to 2 months due to STP Technical Specification Table 4.3-2 Note 6.
3. Because channel calibrations are not typically performed at-power at STP (typically performed during refueling outages), and the STP calibration interval is equal to or greater than that used in WCAP-14333, the analysis is applicable to STP.
4. STP maintenance intervals are equal to or greater than those used in WCAP-14333, therefore the analysis is applicable to STP.
5. Only corrective maintenance is done on the master and slave relays. The maintenance interval on typical relays is relatively long; that is, experience has shown they do not typically completely fail. Failure of slave relays usually involves failure of individual contacts. Since "infrequent" slave relay failures are the norm for STP, then the WCAP-14333 analysis is applicable to STP.
6. The STP AMSAC design will initiate AFW pump start; therefore the WCAP-14333 analysis is applicable to STP. However, the STP PRA does not credit its function due to associated small contribution to core damage frequency.
7. Per WOG-98-245 guidance, this does not include events initiated by a reactor trip.
8. Provided to demonstrate relative contribution of ATWS event to CDF.
9. Provided for comparison to the NRC's risk-informed CDF acceptance guidelines.
10. Total CDF from internal events from the IPE model (submitted to the NRC in response to Generic Letter 88-20.

Table 2
WCAP-14333 Implementation Guidelines: Applicability of Analysis (Cont'd)
Reactor Trip Actuation Signals

Event	WCAP-14333 Analysis Assumption	Plant Specific Parameter [1]
Large LOCA	Not Required	Agree
Medium LOCA	Not Required	Agree
Small LOCA	Nondiverse [2] w/OA [3]	Agree
Steam Generator Tube Rupture	Nondiverse w/OA	Agree
Interfacing System LOCA	Not Required	Agree
Reactor Vessel Rupture	Not Required	Agree
Secondary Side Breaks	Nondiverse w/OA	Agree
Transient Events, such as:	Diverse [4] w/OA	
- Positive Reactivity Insertion		Agree
- Loss of Reactor Coolant Flow		Agree
- Total or Partial Loss of Main Feedwater		Agree
- Loss of Condenser		Agree
- Turbine Trip		Agree
- Loss of DC Bus		Agree
- Loss of Vital AC Bus		Not Agree[5]
- Loss of Instrument Air		Agree
- Spurious Safety Injection		Not Agree[6]
- Inadvertent Opening of a Steam Valve		Agree
Reactor Trip	Generated by RPS	Agree
Loss of Offsite Power	Not Required by RPS	Agree
Station Blackout	Not Required by RPS	Agree
Loss of Service Water or Component Cooling Water	Nondiverse w/OA	Agree

Table Notes:
1. Use of "agree" for an event indicates the WCAP-14333 analysis is applicable to STP.
2. Nondiverse means that (at least) one signal will be generated to initiate reactor trip for the event.
3. OA indicates that an operator could take action to initiate reactor trip for the event, that is, there is sufficient time for action and procedures are in place that will instruct the operator to take action.
4. Diverse means that (at least) two signals will be generated to initiate reactor trip for the event.
5. There is no direct reactor trip from loss of Vital AC Bus at STP
6. Non-diverse w/OA, however, spurious SI at power would not inject into RCS since STP does not use charging pumps for high pressure safety injection.

Table 3
WCAP-14333 Implementation Guidelines: Applicability of Analysis (Cont'd)
Engineered Safety Features Actuation Signals

Safety Function	Event	WCAP-14333 Analysis Assumption	Plant Specific Parameter [1]
Safety Injection	Large LOCA	Nondiverse [2]	Agree
	Medium LOCA	Nondiverse, OA [3] by SI switch on main control board	Agree
	Small LOCA	Nondiverse, OA by SI switch on main control board, OA of individual components	Agree
	Interfacing Systems LOCA	Nondiverse, OA by SI switch on main control board, OA of individual components	Agree
	SG Tube Rupture	Nondiverse, OA by SI switch on main control board, OA of individual components	Agree
	Secondary Side Breaks	Nondiverse, OA by SI switch on main control board, OA of individual components	Agree
Auxiliary Feedwater Pump Start	Events generating SI signal Transient events	Pump actuation on SI signal Nondiverse, AMSAC, operator action	Agree Agree[4]
Main Feedwater Isolation	Secondary Side Breaks	Nondiverse	Agree
Steamline Isolation	Secondary Side Breaks	Nondiverse	Agree
Containment Spray Actuation	All events	Nondiverse signal	Agree
Containment Isolation	All events	From SI signal	Agree
Containment Cooling	All events	From SI signal	Agree

Table Notes:
1. Use of "agree" for an event indicates the WCAP-14333 analysis is applicable to STP.
2. Nondiverse means that (at least) one signal will be generated to initiate the engineered safety feature noted for the event.
3. OA indicates that an operator could take action to initiate the engineered safety feature for the event, that is, there is sufficient time for action and procedures are in place that will instruct the operator to take action.
4. AMSAC is physically installed in the plant; however, the STP PRA does not credit its function due to its small contribution to core damage frequency

ATTACHMENT 5

TIER 2 AND TIER 3 ANALYSES

Tier 2 and 3 Analyses

1) The South Texas Project currently has in place a risk-informed on-line maintenance tracking and control process. The Configuration Risk Management Program was incorporated into the South Texas Project Technical Specifications via amendments 85 (Unit 1) and 72 (Unit 2), issued on October 31, 1996. These amendments approved an extended allowed outage time of 14 days for the standby diesel generators, and an extended allowed outage time of 7 days for the Essential Cooling Water and Essential Chilled Water systems. In the Safety Evaluation for amendments 85 and 72, the NRC Staff concluded that STP had "provided the necessary assurances that appropriate assessments of the overall impacts on safety functions will be performed prior to any maintenance or other operational activities, including removal of equipment from service". This risk-informed on-line maintenance tracking and control process is implemented and governed by a plant procedure (Configuration Risk Management Program, 0PGP03-ZA-0091).

   As part of the implementation of the proposed license amendment, STP will add solid state protection system train and engineered safety feature actuation system train unavailability to the Configuration Risk Management Program.

2) The effects of instrument analog channels in Bypass will not be included in the Configuration Risk Management Program.

   - For the changes requested, a single instrument analog channel only affects actuation logic. In bypass, the actuation logic is degraded by one, e.g. two-of-four becomes two-of-three if an analog channel is in bypass.

   - STP has completed an analysis of the effects of having one and two analog channels in bypass at all times on reactor trip and safeguards actuation signals. The change in core damage frequency is approximately 1.6E-07 per year with no operator action credited to initiate the actuation signals.

   Because there is no direct equipment effect of a single analog channel in bypass, and the changes in core damage frequency are extremely low if channels are assumed to be in bypass at all times, there is no benefit to tracking analog channel bypass times.

ATTACHMENT 6

ANNOTATED CHANGES TO STP TECHNICAL SPECIFICATIONS AND BASES

(Bases Pages Provided for Information Only)

Note to Reviewer: Technical Specification Pages 3/4 3-7, which is included in the marked-up pages for this proposed amendment request, is also being proposed to be revised in accordance with a separate amendment request, which was originally submitted in Letter NOC-AE-000394, dated December 20, 2000 (and supplemented in Letters NOC-AE-01001022, dated February 1, 2001 and NOC-AE-01001038, dated February 28, 2001).

3/4.3 INSTRUMENTATION

NO CHANGES ON THIS PAGE

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the Reactor Trip System instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Chapter 16 in the Updated Final Safety Analysis Report (UFSAR).

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each Reactor Trip System instrumentation channel and interlock and the automatic trip logic shall be demonstrated OPERABLE by the performance of the Reactor Trip System Instrumentation Surveillance Requirements specified in Table 4.3-1.

4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each Reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one train such that both 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 3.3-1.

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2	1
	2	1	2	3*, 4*, 5*	10
2. Power Range, Neutron Flux					
a. High Setpoint	4	2	3	1, 2	2
b. Low Setpoint	4	2	3	1###, 2	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2
4. Deleted					
5. Intermediate Range, Neutron Flux	2	1	2	1###, 2	3
6. Source Range, Neutron Flux					
a. Startup	2	1	2	2##	4
b. Shutdown	2	1	2	3*, 4*, 5*	10
7. Extended Range, Neutron Flux	2	0	2	3, 4, 5	4
8. Overtemperature ΔT	4	2	3	1, 2	6
9. Overpower ΔT	4	2	3	1, 2	6
10. Pressurizer Pressure--Low (Interlocked with P-7)	4	2	3	1	6
11. Pressurizer Pressure--High	4	2	3	1, 2	6
12. Pressurizer Water Level--High (Interlocked with P-7)	4	2	3	1	6

NO CHANGES ON THIS PAGE

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
13. Reactor Coolant Flow--Low					
a. Single Loop (Above P-8)	3/1oop	2/loop in any operating loop	2/loop in each operating loop	1	6
b. Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two operating loops	2/loop each operating loop	1	6
14. Steam Generator Water Level--Low-Low	4/stm. gen.	2/stm. gen. in any operating stm. gen.	3/stm. gen. each operating stm. gen.	1, 2	6(1)
15. Undervoltage--Reactor Coolant Pumps (Interlocked with P-7)	4-1/bus	2	3	1	6
16. Underfrequency--Reactor Coolant Pumps (Interlocked with P-7)	4-1/bus	2	3	1	6
17. Turbine Trip (Interlocked with P-9)					
a. Low Emergency Trip Fluid Pressure	3	2	2	1	6
b. Turbine Stop Valve Closure	4	2	3	1	6

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
18. Safety Injection Input from ESFAS	2	1	2	1, 2	9A
19. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2	1	2	2##	8
b. Low Power Reactor Trips Block, P-7					
P-10 Input	4	2	3	1	8
or					
P-13 Input	2	1	2	1	8
c. Power Range Neutron Flux, P-8	4	2	3	1	8
d. Power Range Neutron Flux, P-9	4	2	3	1	8
e. Power Range Neutron Flux, P-10	4	2	3	1, 2	8
f. Turbine Impulse Chamber Pressure, P-13	2	1	2	1	8
20. Reactor Trip Breakers	2	1	2	1, 2	9, 12
	2	1	2	3*, 4*, 5*	10

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
21. Automatic Trip and Interlock Logic	2	1	2	1, 2	9A
	2	1	2	3*, 4*, 5*	10

TABLE 3.3-1 (Continued)

TABLE NOTATIONS

*When the Reactor Trip System breakers are in the closed position and the Control Rod Drive System is capable of rod withdrawal.

Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

~~(1) The applicable MODES and ACTION statement for these channels noted in Table 3.3-3 are more restrictive and, therefore, applicable.~~

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 2 - 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. 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, and~~

~~c. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.~~

INSERT 1 HERE

INSERT 1

a. For Functional Units with installed bypass test capability,

Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.

1. The inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours, and

2. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

b. For Functional Units with no installed bypass test capability,

1. The inoperable channel is placed in the tripped condition within 72 hours, and

2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1, and

3. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint, and

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5 - (Not Used)

ACTION 6 - 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, and~~

~~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.~~

INSERT 2 HERE

Actions 7, 8 and 9 Relocated to Page 3/4 3-8

INSERT 2

a. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.

   Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.

b. For Functional Units with no installed bypass test capability,

   1. The inoperable channel is placed in the tripped condition within 72 hours, and

   2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 7 - (Not Used)

ACTION 8 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 9 - With the number of OPERABLE channels one less than 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, provided the other channel is OPERABLE.

ACTION 9A - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1, provided the other channel is OPERABLE.

ACTION 10 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the Reactor Trip System breakers within the next hour.

ACTION 11 - (Not Used)

ACTION 12 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to OPERABLE status within 48 hours or declare the breaker inoperable and apply ACTION 9. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for the time required for performing maintenance to restore the breaker to OPERABLE status.

Relocated from Page 3/4 3-7

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	N.A.	R (14)	N.A.	1, 2, 3*, 4*, 5*
2. Power Range, Neutron Flux						
a. High Setpoint	S	D(2, 4), M(3, 4), Q(4, 6), R(4, 5)	Q (17)	N.A.	N.A.	1, 2
b. Low Setpoint	S	R(4)	S/U (1)	N.A.	N.A.	1***, 2
3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(4)	Q (17)	N.A.	N.A.	1, 2
4. Deleted						
5. Intermediate Range, Neutron Flux	S	R(4, 5)	S/U (1)	N.A.	N.A.	1***, 2
6. Source Range, Neutron Flux	S	R(4, 5)	S/U (1), Q(9) (17)	N.A.	N.A.	2**, 3, 4, 5
7. Extended Range, Neutron Flux	S	R(4)	Q(12, 17)	N.A.	N.A.	3, 4, 5
8. Overtemperature ΔT	S	R	Q (17)	N.A.	N.A.	1, 2
9. Overpower ΔT	S	R	Q (17)	N.A.	N.A.	1, 2
10. Pressurizer Pressure--Low	S	R	Q (17)	N.A.	N.A.	1

Unit 1 - Amendment No. 4, 13, 34,
Unit 2 - Amendment No. 25,

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
11. Pressurizer Pressure --High	S	R	Q(17)	N.A.	N.A.	1, 2
12. Pressurizer Water Level --High	S	R	Q(17)	N.A.	N.A.	1
13. Reactor Coolant Flow --Low	S	R	Q(17, 18)	N.A.	N.A.	1
14. Steam Generator Water Level--Low-Low	S	R	Q(17, 18)	N.A.	N.A.	1, 2
15. Undervoltage - Reactor Coolant Pumps	N.A.	R	N.A.	Q(17)	N.A.	1
16. Underfrequency - Reactor Coolant Pumps	N.A.	R	N.A.	Q(17)	N.A.	1
17. Turbine Trip						
a. Low Emergency Trip Fluid Pressure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
b. Turbine Stop Valve Closure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
18. Safety Injection Input from ESFAS	N.A.	N.A.	N.A.	R	N.A.	1, 2

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
19 Reactor Trip System Interlocks						
a. Intermediate Range Neutron Flux, P-6	N.A.	R(4)	R	N.A.	N.A.	2**
b. Low Power Reactor Trips Block, P-7	N.A.	R(4)	R	N.A.	N.A.	1
c. Power Range Neutron Flux, P-8	N.A.	R(4)	R	N.A.	N.A.	1
d. Power Range Neutron Flux, P-9	N.A.	R(4)	R	N.A.	N.A.	1
e. Power Range Neutron Flux, P-10	N.A.	R(4)	R	N.A.	N.A.	1, 2
f. Turbine Impulse Chamber Pressure, P-13	N.A.	R	R	N.A.	N.A.	1
20. Reactor Trip Breaker	N.A.	N.A.	N.A.	Q (7, 11)	N.A.	1, 2, 3*, 4*, 5*
21. Automatic Trip and Interlock Logic	N.A.	N.A.	N.A.	N.A.	Q(7)	1, 2, 3*, 4*, 5*
22. Reactor Trip Bypass Breaker	N.A.	N.A.	N.A.	Q(15), R(16)	N.A.	1, 2, 3*, 4*, 5*

NO CHANGES ON THIS PAGE

TABLE 4.3-1 (Continued)

TABLE NOTATIONS

* When the Reactor Trip System breakers are closed and the Control Rod Drive System is capable of rod withdrawal.

** Below P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

*** Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

(1) If not performed in previous 31 days.

(2) Comparison of calorimetric to excore power indication above 15% of RATED THERMAL POWER. Adjust excore channel gains consistent with calorimetric power if absolute difference is greater than 2%. The provisions of Specification 4.0.4 are not applicable to entry into MODE 2 or 1.

*(3) Single point comparison of incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference is greater than or equal to 3%. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1. For the purpose of this surveillance requirement, monthly shall mean at least once per 31 EFPD.

(4) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) Detector plateau curves shall be obtained and evaluated. If a low noise preamplifier is used with the Source Range Detector, no plateau curve is obtained. Instead, with the high voltage setting varied as recommended by the manufacturer, an initial discriminator bias curve shall be measured for each detector. Subsequent discriminator bias curves shall be obtained, evaluated and compared to the initial curves. For the Intermediate Range and Power Range Neutron Flux channels the provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1.

*(6) Incore - Excore Calibration, above 75% of RATED THERMAL POWER. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1. For the purpose of this surveillance requirement, quarterly shall mean at least once per 92 EFPD.

(7) Each train shall be tested at least every 92 days on a STAGGERED TEST BASIS.

(8) (Not Used)

(9) Quarterly surveillance in MODES 3*, 4*, and 5* shall also include verification that permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS (Continued)

(10) Setpoint verification is not applicable.

(11) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.

(12) OPERABILITY shall be verified by a check of memory devices, input accuracies, Boron Dilution Alarm setpoints, output values, and software functions.

(13) (Not used)

(14) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).

(15) Local manual shunt trip prior to placing breaker in service.

(16) Automatic undervoltage trip.

(17) Each channel shall be tested at least every 92 days on a STAGGERED TEST BASIS.

(18) The surveillance frequency and/or MODES specified for these channels in Table 4.3-2 are more restrictive and, therefore, applicable.

(19) For channels with bypass test instrumentation, input relays are tested on an 18-month (R) frequency.

NO CHANGES ON THIS PAGE

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features 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 Trip Setpoint column of Table 3.3-4 and with RESPONSE TIMES as shown in Chapter 16 in the UFSAR.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation or Interlock Trip Setpoint trip less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 3.3-4, adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-3 until the channel is restored to OPERABLE status with its Setpoint adjusted consistent with the Trip Setpoint value.

c. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

NO CHANGES ON THIS PAGE

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic acutation logic and relays shall be demonstrated OPERABLE by performance of the ESFAS Instrumentation Surveillance Requirements specified in Table 4.3.2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one train so that:

a. Each logic train is tested at least once per 36 months,

b. Each actuation train is tested at least once per 54 months*, and

c. One channel per function so that all channels are tested 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.

*If an ESFAS instrumentation channel is inoperable due to response times exceeding the required limits, perform an engineering evaluation to determine if the test failure is a result of degradation of the actuation relays. If degradation of the actuation relays is determined to be the cause, increase the ENGINEERED SAFETY FEATURES RESPONSE TIME surveillance frequency such that all trains are tested at least once per 36 months.

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Safety Injection (Reactor Trip, Feedwater Isolation, Control Room Emergency Ventilation, Start Standby Diesel Generators, Reactor Containment Fan Coolers, and Essential Cooling Water).					
a. Manual Initiation	2	1	2	1, 2, 3, 4	19
b. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	14
c. Actuation Relays	3	2	3	1, 2, 3 ,4	14
d. Containment Pressure--High-1	3	2	2	1, 2, 3 4	~~15~~ 20
e. Pressurizer Pressure--Low	4	2	3	1, 2, 3#	20
f. Compensated Steam Line Pressure–Low	3/steam line	2/steam line any steam line	2/steam line in each steam line	1, 2, 3#	~~15~~ 20

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	MINIMUM CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
2. Containment Spray					
a. Manual Initiation	2	1 with 2 coincident switches	2	1, 2, 3, 4	19
b. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	14
c. Actuation Relays	3	2	3	1, 2, 3 ,4	14
d. Containment Pressure--High-3	4	2	3	1, 2, 3	17
3. Containment Isolation					
a. Phase "A" Isolation					
1) Manual Initiation	2	1	2	1, 2, 3, 4	19
2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	14
3) Actuation Relays	3	2	3	1, 2, 3, 4	14
4) Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3. Containment Isolation (Continued)					
b. Containment Ventilation Isolation					
1) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	18
2) Actuation Relays***	3	2	3	1, 2, 3, 4	18
3) Safety Injection ***	See Item 1. above for all Safety Injection initiating functions and requirements.				
4) RCB Purge Radioactivity-High	2	1	2	1, 2, 3, 4, 5##, 6##	18
5) Containment Spray-Manual Initiation	See Item 2. above for Containment Spray manual initiating functions and requirements.				
6) Phase "A" Isolation-Manual Isolation	See Item 3.a. above for Phase "A" Isolation manual initiating functions and requirements.				
c. Phase "B" Isolation					
1) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	14
2) Actuation Relays	3	2	3	1, 2, 3, 4	14
3) Containment Pressure--High-3	4	2	3	1, 2, 3	17
4) Containment Spray-Manual Initiation	See Item 2. above for Containment Spray manual initiating functions and requirements.				
d. RCP Seal Injection Isolation					
1) Automatic Actuation Logic and Actuation Relays	1	1	1	1, 2, 3, 4	16

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3.d. RCP Seal Injection Isolation (Continued)					
2) Charging Header Pressure - Low	1	1	1	1, 2, 3, 4	16
Coincident with Phase "A" Isolation	See item 3.a. above for Phase "A" Isolation initiating functions and requirements				
4. Steam Line Isolation					
a. Manual Initiation					
1) Individual	2/steam line	1/steam line	2/operating steam line	1, 2, 3	24
2) System	2	1	2	1, 2, 3	23
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	22
c. Steam Line Pressure - Negative Rate--High	3/steam line	2/steam line any steam line	2/ steam line in each steam line	3###	~~15~~ 20
d. Containment Pressure - High-2	3	2	2	1, 2, 3	~~15~~ 20
e. Compensated Steam Line Pressure - Low	3/steam line	2/steam line any steam line	2/steam line in each steam line	1, 2, 3#	~~15~~ 20

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. Turbine Trip and Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	25
b. Steam Generator Water Level-- High-High (P-14)	4/stm. gen.	2/stm. gen. in any operating stm. gen.	3/stm. gen. in each operating stm. gen.	1, 2, 3	20
c. Deleted					
d. Deleted					
e. Safety Injection	See Item 1. for all Safety Injection initiating functions and requirements.				
f. Tavg-Low coincident with Reactor Trip (P-4) (Feedwater Isolation Only)	4 (1/loop)	2	3	1, 2, 3	20

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. Auxiliary Feedwater					
a. Manual Initiation	1/pump	1/pump	1/pump	1, 2, 3	26
b. Automatic Actuation Logic	2	1	2	1, 2, 3	22
c. Actuation Relays	3	2	3	1, 2, 3	22
d. Stm. Gen. Water Level--Low-Low Start Motor-Driven Pumps and Turbine-Driven Pump	4/stm. gen.	2/stm. gen. in any stm. gen.	3/stm. gen. in each stm. gen.	1, 2, 3	20
e. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
f. Loss of Power (Motor Driven Pumps Only)	See Item 8. below for all Loss of Power initiating functions and requirements.				
7. Automatic Switchover to Containment Sump****					
a. Automatic Actuation Logic and Actuation Relays	3-1/train	1/train	1/train	1, 2, 3, 4	19
b. RWST Level--Low-Low	3-1/train	1/train	1/train	1, 2, 3, 4	19
Coincident With: Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
8. Loss of Power					
a. 4.16 kV ESF Bus Under-voltage-Loss of Voltage	4/bus	2/bus	3/bus	1, 2, 3, 4	20
b. 4.16 kV ESF Bus Under-voltage-Tolerable Degraded Voltage Coincident with SI	4/bus	2/bus	3/bus	1, 2, 3, 4	20
c. 4.16 kV ESF Bus Under-voltage - Sustained Degraded Voltage	4/bus	2/bus	3/bus	1, 2, 3, 4	20
9. Engineered Safety Features Actuation System Interlocks					
a. Pressurizer Pressure, P-11	3	2	2	1, 2, 3	21
b. Low-Low T_{avg} , P-12	4	2	3	1, 2, 3	21
c. Reactor Trip, P-4	2	1	2	1, 2, 3	23

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
10. Control Room Ventilation					
a. Manual Initiation	3 (1/train)	2 (1/train)	3 (1/train)	All	27
b. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
c. Automatic Actuation Logic and Actuation Relays	3	2	3	All	27
d. Control Room Intake Air Radioactivity - High	2	1	2	All	28
e. Loss of Power	See Item 8. above for all Loss of Power initiating functions and requirements.				
11. FHB HVAC					
a. Manual Initiation	3 (1/train)	2 (1/train)	3 (1/train)	1, 2, 3, 4 or with irradiated fuel in spent fuel pool	29, 30
b. Automatic Actuation Logic and Actuation Relays	3	2	3	1, 2, 3, 4 or with irradiated fuel in spent fuel pool	29, 30
c. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
d. Spent Fuel Pool Exhaust Radioactivity - High	2	1	2	With irradiated fuel in spent fuel pool	30

NO CHANGES ON THIS PAGE

TABLE 3.3-3 (Continued)

TABLE NOTATIONS

***Function is actuated by either actuation train A or actuation train B. Actuation train C is not used for this function.

****Automatic switchover to containment sump is accomplished for each train using the corresponding RWST level transmitter.

#Trip function may be blocked in this MODE below the P-11 (Pressurizer Pressure Interlock) Setpoint.

##During CORE ALTERATIONS or movement of irradiated fuel within containment.

###Trip function automatically blocked above P-11 and may be blocked below P-11 when Low Compensated Steamline Pressure Protection is not blocked.

ACTION STATEMENTS

ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.

ACTION 15 - ~~With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.~~ (Not Used)

ACTION 16 - With the Charging Header Pressure channel inoperable:

a) Place the Charging Header Pressure channel in the tripped condition within one hour and

b) Restore the Charging Header Pressure channel 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.

ACTION 17 - With the number of OPERABLE channels one less than the Total Number of Channels, ~~operation may proceed provided~~ place the inoperable channel ~~is placed~~ in the bypassed condition within 72 hours, ~~and the Minimum Channels OPERABLE requirement is met~~, or be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours. One additional channel may be bypassed for up to ~~2~~ 12 hours for surveillance testing per Specification 4.3.2.1.

ACTION 18 - With less than the Minimum Channels OPERABLE requirement, operation may continue provided the containment purge supply and exhaust valves are maintained closed.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS (Continued)

ACTION 19 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, 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.

ACTION 20 - 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 1 hour, and~~

~~b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels per Specification 4.3.2.1.~~

INSERT 3 HERE

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 22 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 23 - 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 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 declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

Relocate to Page 3/4 3-28.

ACTION 25 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to ~~2~~ 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

INSERT 3

a. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.

   Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.2.1, provided no more than one channel is in bypass at any time.

b. For Functional Units with no installed bypass test capability,

   1. The inoperable channel is placed in the tripped condition within 72 hours, and

   2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.2.1.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS (Continued)

Relocate Actions 24 and 25 here

ACTION 26 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, declare the affected Auxiliary Feedwater Pump inoperable and take ACTION required by Specification 3.7.1.2.

ACTION 27- For an inoperable channel, declare its associated ventilation train inoperable and apply the actions of Specification 3.7.7.

ACTION 28 - With the number of OPERABLE channels less than the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the Control Room Makeup and Cleanup Filtration System (at 100% capacity) in the recirculation and makeup filtration mode.

ACTION 29 - For an inoperable channel, declare its associated ventilation train inoperable and apply the actions of Specification 3.7.8.

ACTION 30 - With irradiated fuel in the spent fuel pool: With the number of OPERABLE channels less than the Minimum Channels OPERABLE requirement, fuel movement within the spent fuel pool or crane operation with loads over the spent fuel pool may proceed provided the FHB exhaust air filtration system is in operation and discharging through at least one train of HEPA filters and charcoal adsorbers.

TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Safety Injection (Reactor Trip, Feedwater Isolation, Control Room Emergency Ventilation, Start Standby Diesel Generators, Reactor Containment Fan Coolers, and Essential Cooling Water)								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(4, 5)	1, 2, 3, 4
d. Containment Pressure-High-1	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
e. Pressurizer Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
f. Compensated Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

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Unit 2 - Amendment No. 47,

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
2. Containment Spray								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4
d. Containment Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
3. Containment Isolation								
a. Phase "A" Isolation								
1) Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
3) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(4)	1, 2, 3, 4
4) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
b. Containment Ventilation Isolation								
1) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
2) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. Containment Isolation (Continued)								
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
4) RCB Purge Radioactivity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4, 5*, 6*
5) Containment Spray - Manual Initiation	See Item 2. above for Containment Spray manual initiation Surveillance Requirements.							
6) Phase "A" Isolation-Manual Initiation	See Item 3. a. above for Phase "A" Isolation manual initiation Surveillance Requirements.							
c. Phase "B" Isolation								
1) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
2) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4
3) Containment Pressure--High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
4) Containment Spray-Manual Initiation	See Item 2. above for Containment Spray manual initiation Surveillance Requirements.							
d. RCP Seal Injection Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q	Q	1, 2, 3, 4
2) Charging Header Pressure - Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
Coincident with Phase "A" Isolation	See Item 3.a. above for Phase "A" surveillance requirements.							

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steam Line Isolation								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(1)	Q(6)	Q	1, 2, 3
c. Steam Line Pressure-Negative Rate-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	3
d. Containment Pressure - High-2	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Compensated Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
5. Turbine Trip and Feedwater Isolation								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(1)	Q(6)	Q(4)	1, 2, 3
b. Steam Generator Water Level-High-High (P-14)	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Deleted								
d. Deleted								
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
5. Turbine Trip and Feedwater Isolation (Continued)								
f. Tavg -Low Coincident with Reactor Trip (P-4) (Feedwater Isolation Only)	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
6. Auxiliary Feedwater								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3
d. Steam Generator Water Level--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
f. Loss of Power	See Item 8. below for all Loss of Power Surveillance Requirements.							
7. Automatic Switchover to Containment Sump								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(6)	Q	1, 2, 3, 4
b. RWST Level--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
Coincident With: Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED	
8. Loss of Power									
a. 4.16 kV ESF Bus Undervoltage (Loss of Voltage)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4	|
b. 4.16 kV ESF Bus Undervoltage (Tolerable Degraded Voltage Coincident with SI)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4	|
c. 4.16 kV ESF Bus Undervoltage (Sustained Degraded Voltage)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4	|
9. Engineered Safety Features Actuation System Interlocks									
a. Pressurizer Pressure, P-11	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3	|
b. Low-Low T_{avg}, P-12	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3	|
c. Reactor Trip, P-4	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3	
10. Control Room Ventilation									
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	All	

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
10. Control Room Ventilation (Continued)								
b. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
c. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	N.A.	N.A.	All
d. Control Room Intake Air Radioactivity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	All
e. Loss of Power	See Items 8. above for all Loss of Power Surveillance Requirements.							
11. FHB HVAC								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4, or with irradiated fuel in the spent fuel pool
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	N.A.	N.A.	1, 2, 3, 4, or with irradiated fuel in the spent fuel pool.

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
11. FHB HVAC (Continued)								
c. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
d. Spent Fuel Pool Exhaust Radio-activity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	With irradiated fuel in spent fuel pool.

TABLE NOTATION

(1) Each train shall be tested at least every 92 days on a STAGGERED TEST BASIS.

(2) Deleted

(3) Deleted

(4) Except relays K807, K814, K829 (Train B only), K831, K845, K852 and K854 (Trains B and C only) which shall be tested at least once per 18 months during refueling and during each COLD SHUTDOWN exceeding 24 hours unless they have been tested within the previous 92 days.

(5) Except relay K815 which shall be tested at indicated interval only when reactor coolant pressure is above 700 psig.

(6) Each actuation train shall be tested at least every 92 days on a STAGGERED TEST BASIS. Testing of each actuation train shall include master relay testing of both logic trains. If an ESFAS instrumentation channel is inoperable due to failure of the Actuation Logic Test and/or Master Relay Test, increase the surveillance frequency such that each train is tested at least every 62 days on a STAGGERED TEST BASIS unless the failure can be determined by performance of an engineering evaluation to be a single random failure.

(7) For channels with bypass test instrumentation, input relays are tested on an 18-month (R) frequency.

* During CORE ALTERATIONS or movement of irradiated fuel within containment.

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For Information Only

3/4.3 INSTRUMENTATION

BASES

3/4.3.1 and 3/4.3.2 REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

The OPERABILITY of the Reactor Trip System and the Engineered Safety Features Actuation System instrumentation and interlocks ensures that: (1) the associated ACTION and/or Reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its Setpoint, (2) the specified coincidence logic is maintained, (3) sufficient redundancy is maintained to permit a channel to be out-of-service for testing or maintenance, and (4) sufficient system functional capability is available from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy, and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the safety analyses. The Surveillance Requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. Specified surveillance intervals and surveillance and maintenance outage times have been determined in accordance with WCAP-10271, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," supplements to that report, WCAP-14333-P-A, Rev. 1, "Probabilistic Risk Analysis of the RPS and ESFAS Test Times and Completion Times," and the South Texas Project probabilistic safety assessment (PSA). Surveillance intervals and out of service times were determined based on maintaining an appropriate level of reliability of the Reactor Protection System instrumentation.

The Engineered Safety Features Actuation System Instrumentation Trip Setpoints specified in Table 3.3-4 are the nominal values at which the bistables are set for each functional unit. A Setpoint is considered to be adjusted consistent with the nominal value when the "as measured" Setpoint is within the band allowed for calibration accuracy.

REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (Continued)

The measurement of response time at the specified frequencies provides assurance that the Reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

The Engineered Safety Features Actuation System senses selected plant parameters and determines whether or not predetermined limits are being exceeded. If they are, the signals are combined into logic matrices sensitive to combinations indicative of various accidents, events, and transients. Once the required logic combination is completed, the system sends actuation signals to those Engineered Safety Features components whose aggregate function best serves the requirements of the condition. As an example, the following actions may be initiated by the Engineered Safety Features Actuation System to mitigate the consequences of a steam line break or loss-of-coolant accident: (1) Safety Injection pumps start, (2) Reactor trip, (3) feedwater isolation, (4) startup of the standby diesel generators, (5) containment spray pumps start and automatic valves position, (6) containment isolation, (7) steam line isolation, (8) Turbine trip, (9) auxiliary feedwater pumps start and automatic valves position, (10) reactor containment fan coolers start, (11) essential cooling water pumps start and automatic valves position, (12) Control Room Ventilation Systems start, and (13) component cooling water pumps start and automatic valves position.

Relocate to Page B3/4 3-1

INSERT 4 HERE

ACTION 27 for an inoperable channel of control room ventilation requires the associated train of control room ventilation to be declared inoperable and the appropriate action taken in accordance with Specification 3.7.7. Each control room ventilation system (train) is actuated by its own instrumentation channel. Consequently an inoperable channel of ventilation actuation instrumentation renders that system/train of ventilation inoperable and Specification 3.7.7 prescribes the appropriate action.

With less than the minimum channels of Control Room Intake Air Radioactivity – High, ACTION 28 of Table 3.3-3 requires the Control Room Makeup and Cleanup Filtration System to be operated at 100% capacity in the recirculation and filtration mode. Any two of the three 50% Control Room Makeup and Cleanup Filtration System trains meet the 100% capacity requirement.

For Information Only

INSERT 4

Several ACTIONS in Tables 3.3-1 and 3.3-3 have been revised to change the allowed outage times and bypass test times in accordance with WCAP-10271 and WCAP-14333, as described earlier. Furthermore, some ACTIONS have been divided such that only certain requirements apply depending on whether the Functional Units have been modified with installed bypass test capability.

Regardless of whether the Functional Units have installed bypass test capability, it should be noted that in certain situations, the ACTIONS permit continued operation (for limited periods of time) with less than the minimum number of channels specified in Tables 3.3-1 and 3.3-3. For example, Table 3.3-1 Functional Unit 11 (Pressurizer Pressure - High) requires a minimum of 3 channels operable. However, since continued operation with an inoperable channel is permitted beyond 72 hours, provided the inoperable channel is placed in trip, and since periodic surveillance testing of the other channels must continue to be performed, ACTION 6 permits a channel to be placed in bypass for up to 12 hours to permit testing. Thus, for a limited period of time (12 hours), 2 channels, or one less than the minimum, would be permitted to be inoperable.

ATTACHMENT 7

STP TECHNICAL SPECIFICATIONS PAGES WITH PROPOSED CHANGES INCORPORATED

Note to Reviewer: Technical Specification Pages 3/4 3-7, which is included in the reconstituted pages for this proposed amendment request, is also being proposed to be revised in accordance with a separate amendment request, which was originally submitted in Letter NOC-AE-000394, dated December 20, 2000 (and supplemented in Letters NOC-AE-01001022, dated February 1, 2001 and NOC-AE-01001038, dated February 28, 2001).

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
13. Reactor Coolant Flow--Low					
a. Single Loop (Above P-8)	3/1oop	2/loop in any operating loop	2/loop in each operating loop	1	6
b. Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two operating loops	2/loop each operating loop	1	6
14. Steam Generator Water Level--Low-Low	4/stm. gen.	2/stm. gen. in any operating stm. gen.	3/stm. gen. each operating stm. gen.	1, 2	6
15. Undervoltage--Reactor Coolant Pumps (Interlocked with P-7)	4-1/bus	2	3	1	6
16. Underfrequency--Reactor Coolant Pumps (Interlocked with P-7)	4-1/bus	2	3	1	6
17. Turbine Trip (Interlocked with P-9)					
a. Low Emergency Trip Fluid Pressure	3	2	2	1	6
b. Turbine Stop Valve Closure	4	2	3	1	6

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
18. Safety Injection Input from ESFAS	2	1	2	1, 2	9A
19. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2	1	2	2##	8
b. Low Power Reactor Trips Block, P-7					
P-10 Input	4	2	3	1	8
or					
P-13 Input	2	1	2	1	8
c. Power Range Neutron Flux, P-8	4	2	3	1	8
d. Power Range Neutron Flux, P-9	4	2	3	1	8
e. Power Range Neutron Flux, P-10	4	2	3	1, 2	8
f. Turbine Impulse Chamber Pressure, P-13	2	1	2	1	8
20. Reactor Trip Breakers	2	1	2	1, 2	9, 12
	2	1	2	3*, 4*, 5*	10

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
21. Automatic Trip and Interlock Logic	2	1	2	1, 2	9A
	2	1	2	3*, 4*, 5*	10

TABLE 3.3-1 (Continued)

TABLE NOTATIONS

*When the Reactor Trip System breakers are in the closed position and the Control Rod Drive System is capable of rod withdrawal.

##Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.

###Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

ACTION 2 - 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. For Functional Units with installed bypass test capability,

Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.

1. The inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours, and

2. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

b. For Functional Units with no installed bypass test capability,

1. The inoperable channel is placed in the tripped condition within 72 hours, and

2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1, and

3. Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint, and

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5 - (Not Used)

ACTION 6 - 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. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.

Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1, provided no more than one channel is in bypass at any time.

b. For Functional Units with no installed bypass test capability,

1. The inoperable channel is placed in the tripped condition within 72 hours, and

2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 7 - (Not Used)

ACTION 8 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 9 - With the number of OPERABLE channels one less than 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, provided the other channel is OPERABLE.

ACTION 9A - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1, provided the other channel is OPERABLE.

ACTION 10 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the Reactor Trip System breakers within the next hour.

ACTION 11 - (Not Used)

ACTION 12 - With one of the diverse trip features (undervoltage or shunt trip attachment) inoperable, restore it to OPERABLE status within 48 hours or declare the breaker inoperable and apply ACTION 9. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for the time required for performing maintenance to restore the breaker to OPERABLE status.

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	N.A	R (14)	N.A.	1, 2, 3*, 4*, 5*
2. Power Range, Neutron Flux						
a. High Setpoint	S	D(2, 4), M(3, 4), Q(4, 6), R(4, 5)	Q (17)	N.A.	N.A.	1, 2
b. Low Setpoint	S	R(4)	S/U (1)	N.A.	N.A.	1***, 2
3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(4)	Q (17)	N.A.	N.A.	1, 2
4. Deleted						
5. Intermediate Range, Neutron Flux	S	R(4, 5)	S/U (1)	N.A.	N.A.	1***, 2
6. Source Range, Neutron Flux	S	R(4, 5)	S/U (1), Q(9) (17)	N.A.	N.A.	2**, 3, 4, 5
7. Extended Range, Neutron Flux	S	R(4)	Q(12, 17)	N.A.	N.A.	3, 4, 5
8. Overtemperature ΔT	S	R	Q (17)	N.A.	N.A.	1, 2
9. Overpower ΔT	S	R	Q (17)	N.A.	N.A.	1, 2
10. Pressurizer Pressure--Low	S	R	Q (17)	N.A.	N.A.	1

Unit 1 - Amendment No. 4, 13, 34,
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TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
11. Pressurizer Pressure --High	S	R	Q(17)	N.A.	N.A.	1, 2
12. Pressurizer Water Level --High	S	R	Q(17)	N.A.	N.A.	1
13. Reactor Coolant Flow --Low	S	R	Q(17, 18)	N.A.	N.A.	1
14. Steam Generator Water Level--Low-Low	S	R	Q(17, 18)	N.A.	N.A.	1, 2
15. Undervoltage - Reactor Coolant Pumps	N.A.	R	N.A.	Q(17)	N.A.	1
16. Underfrequency - Reactor Coolant Pumps	N.A.	R	N.A.	Q(17)	N.A.	1
17. Turbine Trip						
a. Low Emergency Trip Fluid Pressure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
b. Turbine Stop Valve Closure	N.A.	R	N.A.	S/U(1, 10)	N.A.	1
18. Safety Injection Input from ESFAS	N.A.	N.A.	N.A.	R	N.A.	1, 2

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST (19)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
19. Reactor Trip System Interlocks						
a. Intermediate Range Neutron Flux, P-6	N.A.	R(4)	R	N.A.	N.A.	2**
b. Low Power Reactor Trips Block, P-7	N.A.	R(4)	R	N.A.	N.A.	1
c. Power Range Neutron Flux, P-8	N.A.	R(4)	R	N.A.	N.A.	1
d. Power Range Neutron Flux, P-9	N.A.	R(4)	R	N.A.	N.A.	1
e. Power Range Neutron Flux, P-10	N.A.	R(4)	R	N.A.	N.A.	1, 2
f. Turbine Impulse Chamber Pressure, P-13	N.A.	R	R	N.A.	N.A.	1
20. Reactor Trip Breaker	N.A.	N.A.	N.A.	Q (7, 11)	N.A.	1, 2, 3*, 4*, 5*
21. Automatic Trip and Interlock Logic	N.A.	N.A.	N.A.	N.A.	Q(7)	1, 2, 3*, 4*, 5*
22. Reactor Trip Bypass Breaker	N.A.	N.A.	N.A.	Q(15), R(16)	N.A.	1, 2, 3*, 4*, 5*

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TABLE 4.3-1 (Continued)

TABLE NOTATIONS (Continued)

(10) Setpoint verification is not applicable.

(11) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.

(12) OPERABILITY shall be verified by a check of memory devices, input accuracies, Boron Dilution Alarm setpoints, output values, and software functions.

(13) (Not used)

(14) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).

(15) Local manual shunt trip prior to placing breaker in service.

(16) Automatic undervoltage trip.

(17) Each channel shall be tested at least every 92 days on a STAGGERED TEST BASIS.

(18) The surveillance frequency and/or MODES specified for these channels in Table 4.3-2 are more restrictive and, therefore, applicable.

(19) For channels with bypass test instrumentation, input relays are tested on an 18-month (R) frequency.

TABLE 3.3-3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Safety Injection (Reactor Trip, Feedwater Isolation, Control Room Emergency Ventilation, Start Standby Diesel Generators, Reactor Containment Fan Coolers, and Essential Cooling Water).					
a. Manual Initiation	2	1	2	1, 2, 3, 4	19
b. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	14
c. Actuation Relays	3	2	3	1, 2, 3 ,4	14
d. Containment Pressure--High-1	3	2	2	1, 2, 3 4	20
e. Pressurizer Pressure--Low	4	2	3	1, 2, 3#	20
f. Compensated Steam Line Pressure–Low	3/steam line	2/steam line any steam line	2/steam line in each steam line	1, 2, 3#	20

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3.d. RCP Seal Injection Isolation (Continued)					
2) Charging Header Pressure - Low	1	1	1	1, 2, 3, 4	16
Coincident with Phase "A" Isolation	See item 3.a. above for Phase "A" Isolation initiating functions and requirements				
4. Steam Line Isolation					
a. Manual Initiation					
1) Individual	2/steam line	1/steam line	2/operating steam line	1, 2, 3	24
2) System	2	1	2	1, 2, 3	23
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	22
c. Steam Line Pressure - Negative Rate--High	3/steam line	2/steam line any steam line	2/ steam line in each steam line	3###	20
d. Containment Pressure - High-2	3	2	2	1, 2, 3	20
e. Compensated Steam Line Pressure - Low	3/steam line	2/steam line any steam line	2/steam line in each steam line	1, 2, 3#	20

TABLE 3.3-3 (Continued)

TABLE NOTATIONS

***Function is actuated by either actuation train A or actuation train B. Actuation train C is not used for this function.

****Automatic switchover to containment sump is accomplished for each train using the corresponding RWST level transmitter.

#Trip function may be blocked in this MODE below the P-11 (Pressurizer Pressure Interlock) Setpoint.

##During CORE ALTERATIONS or movement of irradiated fuel within containment.

###Trip function automatically blocked above P-11 and may be blocked below P-11 when Low Compensated Steamline Pressure Protection is not blocked.

ACTION STATEMENTS

ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.

ACTION 15 - (Not Used)

ACTION 16 - With the Charging Header Pressure channel inoperable:

a) Place the Charging Header Pressure channel in the tripped condition within one hour and

b) Restore the Charging Header Pressure channel 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.

ACTION 17 - With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel in the bypassed condition within 72 hours, or be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours. One additional channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.2.1.

ACTION 18 - With less than the Minimum Channels OPERABLE requirement, operation may continue provided the containment purge supply and exhaust valves are maintained closed.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS (Continued)

ACTION 19 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, 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.

ACTION 20 - 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. For Functional Units with installed bypass test capability, the inoperable channel may be placed in bypass, and must be placed in the tripped condition within 72 hours.

Note: A channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.2.1, provided no more than one channel is in bypass at any time.

b. For Functional Units with no installed bypass test capability,

1. The inoperable channel is placed in the tripped condition within 72 hours, and

2. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.2.1.

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 22 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 23 - 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.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS (Continued)

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 declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 25 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours, or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 26 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, declare the affected Auxiliary Feedwater Pump inoperable and take ACTION required by Specification 3.7.1.2.

ACTION 27 - For an inoperable channel, declare its associated ventilation train inoperable and apply the actions of Specification 3.7.7.

ACTION 28 - With the number of OPERABLE channels less than the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the Control Room Makeup and Cleanup Filtration System (at 100% capacity) in the recirculation and makeup filtration mode.

ACTION 29 - For an inoperable channel, declare its associated ventilation train inoperable and apply the actions of Specification 3.7.8.

ACTION 30 - With irradiated fuel in the spent fuel pool: With the number of OPERABLE channels less than the Minimum Channels OPERABLE requirement, fuel movement within the spent fuel pool or crane operation with loads over the spent fuel pool may proceed provided the FHB exhaust air filtration system is in operation and discharging through at least one train of HEPA filters and charcoal adsorbers.

TABLE 4.3-2

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Safety Injection (Reactor Trip, Feedwater Isolation, Control Room Emergency Ventilation, Start Standby Diesel Generators, Reactor Containment Fan Coolers, and Essential Cooling Water)								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(4, 5)	1, 2, 3, 4
d. Containment Pressure-High-1	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
e. Pressurizer Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
f. Compensated Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
2. Containment Spray								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4
d. Containment Pressure-High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
3. Containment Isolation								
a. Phase "A" Isolation								
1) Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
3) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(4)	1, 2, 3, 4
4) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
b. Containment Ventilation Isolation								
1) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
2) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. Containment Isolation (Continued)								
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
4) RCB Purge Radioactivity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4, 5*, 6*
5) Containment Spray - Manual Initiation	See Item 2. above for Containment Spray manual initiation Surveillance Requirements.							
6) Phase "A" Isolation-Manual Initiation	See Item 3. a. above for Phase "A" Isolation manual initiation Surveillance Requirements.							
c. Phase "B" Isolation								
1) Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3, 4
2) Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3, 4
3) Containment Pressure--High-3	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
4) Containment Spray-Manual Initiation	See Item 2. above for Containment Spray manual initiation Surveillance Requirements.							
d. RCP Seal Injection Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q	Q	1, 2, 3, 4
2) Charging Header Pressure - Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
Coincident with Phase "A" Isolation	See Item 3.a. above for Phase "A" surveillance requirements.							

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steam Line Isolation								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(1)	Q(6)	Q	1, 2, 3
c. Steam Line Pressure-Negative Rate-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	3
d. Containment Pressure - High-2	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Compensated Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
5. Turbine Trip and Feedwater Isolation								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(1)	Q(6)	Q(4)	1, 2, 3
b. Steam Generator Water Level-High-High (P-14)	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Deleted								
d. Deleted								
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
5. Turbine Trip and Feedwater Isolation (Continued)								
f. Tavg -Low Coincident with Reactor Trip (P-4) (Feedwater Isolation Only)	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
6. Auxiliary Feedwater								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic	N.A.	N.A.	N.A.	N.A.	Q(1)	N.A.	N.A.	1, 2, 3
c. Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.	Q(6)	Q	1, 2, 3
d. Steam Generator Water Level--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
f. Loss of Power	See Item 8. below for all Loss of Power Surveillance Requirements.							
7. Automatic Switchover to Containment Sump								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	Q(6)	Q	1, 2, 3, 4
b. RWST Level--Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
Coincident With: Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
8. Loss of Power								
a. 4.16 kV ESF Bus Undervoltage (Loss of Voltage)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4
b. 4.16 kV ESF Bus Undervoltage (Tolerable Degraded Voltage Coincident with SI)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4
c. 4.16 kV ESF Bus Undervoltage (Sustained Degraded Voltage)	N.A.	R	N.A.	Q	N.A.	N.A.	N.A.	1, 2, 3, 4
9. Engineered Safety Features Actuation System Interlocks								
a. Pressurizer Pressure, P-11	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. Low-Low T_{avg}, P-12	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
c. Reactor Trip, P-4	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
10. Control Room Ventilation								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	All

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
10. Control Room Ventilation (Continued)								
b. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
c. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	N.A.	N.A.	All
d. Control Room Intake Air Radioactivity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	All
e. Loss of Power	See Items 8. above for all Loss of Power Surveillance Requirements.							
11. FHB HVAC								
a. Manual Initiation	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4, or with irradiated fuel in the spent fuel pool
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	Q(6)	N.A.	N.A.	1, 2, 3, 4, or with irradiated fuel in the spent fuel pool.

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TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

CHANNEL FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	DIGITAL OR ANALOG CHANNEL OPERATIONAL TEST (7)	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
11. FHB HVAC (Continued)								
c. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
d. Spent Fuel Pool Exhaust Radio-activity-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	With irradiated fuel in spent fuel pool.

TABLE NOTATION

(1) Each train shall be tested at least every 92 days on a STAGGERED TEST BASIS.

(2) Deleted

(3) Deleted

(4) Except relays K807, K814, K829 (Train B only), K831, K845, K852 and K854 (Trains B and C only) which shall be tested at least once per 18 months during refueling and during each COLD SHUTDOWN exceeding 24 hours unless they have been tested within the previous 92 days.

(5) Except relay K815 which shall be tested at indicated interval only when reactor coolant pressure is above 700 psig.

(6) Each actuation train shall be tested at least every 92 days on a STAGGERED TEST BASIS. Testing of each actuation train shall include master relay testing of both logic trains. If an ESFAS instrumentation channel is inoperable due to failure of the Actuation Logic Test and/or Master Relay Test, increase the surveillance frequency such that each train is tested at least every 62 days on a STAGGERED TEST BASIS unless the failure can be determined by performance of an engineering evaluation to be a single random failure.

(7) For channels with bypass test instrumentation, input relays are tested on an 18-month (R) frequency.

* During CORE ALTERATIONS or movement of irradiated fuel within containment.

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