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

June 24, 2021
NOC-AE-21003814
10 CFR 50.4
10 CFR 50.71(e)
STI: 35179580

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Technical Specification Bases Control Program

Pursuant to Technical Specification (TS) 6.8.3.m, STP Nuclear Operating Company (STPNOC) submits the periodic report of changes made to the South Texas Project TS Bases without prior NRC approval. This report covers the period from June 16, 2019 to June 16, 2021.

Page	Amendment	Description of Change
B 3/4 0-1, 0-2, 0-3, 0-5, 0-6, 0-7, 0-8, 0-8a	16-6822-5	Revised to provide additional information following NRC approval of Amendment 218 for Unit 1 and Amendment 204 for Unit 2 regarding never performed surveillances.
B 3/4 3-2a	21-4389	Revised to allow sluicing and flushing of the chemical volume control system with one extended range neutron flux monitor channel inoperable.
B 3/4 3-7, 3-8	16-3172-1	Revised to clarify the meaning of the term required channel.
B 3/4 4-5, 4-6	15-18253-14	Revised to provide additional information following NRC approval of Amendment 220 for Unit 1 and Amendment 205 for Unit 2 regarding Dose Equivalent Xenon implementation.
B 3/4 7-4	12-31354-3	Revised to provide additional information following NRC approval of Amendment 215 for Unit 1 and Amendment 201 for Unit 2 regarding control room makeup and cleanup filtration system runtime.

Page	Amendment	Description of Change
B 3/4 8-4, 8-4a, 8-6, 8-7, 8-8, 8-9, 8-10, 8-10a, 8-11, 8-13, 8-14	16-2176-36	Revised to provide additional information following NRC approval of Amendment 216 for Unit 1 and Amendment 202 for Unit 2 regarding standby diesel generator surveillance requirements.

There are no commitments in this letter.

If you have any questions on this matter, please contact me at (361) 972-7666 or N. Boehmisch at (361) 972-8172.

Andrew M. Richards Jr.
Manager, Regulatory Affairs

Attachment: Revised Bases Pages

cc:
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
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Attachment

Revised Bases Pages

3/4.0 APPLICABILITY

BASES

Specification 3.0.1 through 3.0.5 establish the general requirements applicable to Limiting Conditions for Operation. These requirements are based on the requirements for Limiting Conditions for Operation stated in the Code of Federal Regulations, 10 CFR 50.36(c)(2):

"Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action. permitted by the technical specification until the condition can be met."

Specification 3.0.1 establishes the Applicability statement within each individual specification as the requirement for when (i.e., in which OPERATIONAL MODES or other specified conditions) conformance to the Limiting Conditions for Operation is required for safe operation of the facility. The ACTION requirements establish those remedial measures that must be taken within specified time limits when the requirements of a Limiting Condition for Operation are not met.

There are two basic types of ACTION requirements. The first specifies the remedial measures that permit continued operation of the facility which is not further restricted by the time limits of the ACTION requirements. In this case, conformance to the ACTION requirements provides an acceptable level of safety for unlimited continued operation as long as the ACTION requirements continue to be met. The second type of ACTION requirement specifies a time limit in which conformance to the conditions of the Limiting Condition for Operation must be met. This time limit is the allowable outage time to restore an inoperable system or component to OPERABLE status or for restoring parameters within specified limits. If these actions are not completed within the allowable outage time limits, a shutdown is required to place the facility in a MODE or condition in which the specification no longer applies. It is not intended that the shutdown ACTION requirements be used as an operational convenience which permits (routine) voluntary removal of a system(s) or component(s) from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

The specified time limits of the ACTION requirements are applicable from the point in time it is identified that a Limiting Condition for Operation is not met; unless otherwise specified. The time limits of the ACTION requirements are also applicable when a system or component is removed from service for surveillance testing or investigation of operational problems. Individual specifications may include a specified time limit for the completion of a Surveillance Requirement when equipment is removed from service. In this case, the allowable outage time limits of the ACTION requirements are applicable when this limit expires if the surveillance has not been completed. When a shutdown is required to comply with ACTION requirements, the plant may have entered a MODE in which a new specification becomes applicable. In this case, the time limits of the ACTION requirements would apply from the point in time that the new specification becomes applicable if the requirements of the Limiting Condition for Operation are not met.

Specification 3.0.2 establishes that noncompliance with a specification exists when the requirements of the Limiting Condition for Operation are not met and the associated ACTION requirements have not been implemented within the specified time interval. The purpose of this specification is to clarify that (1) implementation of the ACTION requirements within the specified time interval constitutes compliance with a specification and (2) completion of the remedial measures of the ACTION requirements is not required when compliance with a Limiting Condition for Operation is restored within the time interval specified in the associated ACTION requirements.

Specification 3.0.3 establishes the shutdown ACTION requirements that must be implemented when a Limiting Condition for Operation is not met and the condition is not specifically addressed by the associated ACTION requirements. The purpose of this specification is to delineate the time limits for placing the unit in a safe shutdown MODE when plant operation cannot be maintained within the limits for safe operation defined by the Limiting Conditions for Operation and its ACTION requirements. It is not intended to be used as an operational convenience which permits (routine) voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable. One hour is allowed to prepare for an orderly shutdown before initiating a change in plant operation. This time permits the operator to coordinate the reduction in electrical generation with the load dispatcher to ensure the stability and availability of the electrical grid. The time limits specified to enter lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner that is well within the specified maximum cooldown rate and within the cooldown capabilities of the facility assuming only the minimum required equipment is OPERABLE. This reduces thermal stresses on components of the primary coolant system and the potential for a plant upset that could challenge safety systems under conditions for which this specification applies.

If remedial measures permitting limited continued operation of the facility under the provisions of the ACTION requirements are completed, the shutdown may be terminated. The time limits of the ACTION requirements are applicable from the point in time there was a failure to meet a Limiting Condition for Operation. Therefore, the shutdown may be terminated if the ACTION requirements have been met or, the Limiting Condition for Operation is no longer applicable, or the time limits of the ACTION requirements have not expired, thus providing an allowance for the completion of the required actions.

The time limits of Specification 3.0.3 allow 37 hours for the plant to be in the COLD SHUTDOWN MODE when a shutdown is required during the POWER MODE of operation. If the plant is in a lower MODE of operation when a shutdown is required, the time limit for entering the next lower MODE of operation applies. However, if a lower MODE of operation is entered in less time than allowed, the total allowable time to enter COLD SHUTDOWN, or other applicable MODE, is not reduced. For example, if HOT STANDBY is entered in 2 hours, the time allowed to enter HOT SHUTDOWN is the next 11 hours because the total time to enter HOT SHUTDOWN is not reduced from the allowable limit of 13 hours. Therefore, if remedial measures are completed that would permit a return to POWER operation, a penalty is not incurred by having to enter a lower MODE of operation in less than the total time allowed.

The same principle applies with regard to the allowable outage time limits of the ACTION requirements, if compliance with the ACTION requirements for one specification results in entry into a MODE or condition of operation for another specification in which the requirements of the Limiting Condition for Operation are not met. If the new specification becomes applicable in less time than specified, the difference may be added to the allowable outage time limits of the second specification. However, the allowable outage time limits of ACTION requirements for a higher MODE of operation may not be used to extend the allowable outage time that is applicable when a Limiting Condition for Operation is not met in a lower MODE of operation.

The shutdown requirements of Specification 3.0.3 do not apply in MODES 5 and 6, because the ACTION requirements of individual specifications define the remedial measures to be taken.

Specification 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unit conditions are such that the requirements of the LCO would not be met, in accordance with either Specification 3.0.4.a, 3.0.4.b, or 3.0.4.c.

Specification 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the LCO not met when the associated ACTIONS to be entered following entry into in the MODE or other specified condition in the Applicability will permit continued operation within the MODE or other specified condition for an unlimited period of time. Compliance with ACTIONS that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made and the ACTIONS followed after entry into the Applicability.

For example, Technical Specification 3.0.4.a may be used when the ACTION to be entered states that an inoperable instrument channel must be placed in the trip condition within the allowed outage time. Transition into a MODE or other specified condition in the Applicability may be made in accordance with Technical Specification 3.0.4 and the channel is subsequently placed in the tripped condition within the allowed outage time, which begins when the Applicability is entered. If the instrument channel cannot be placed in the tripped condition and ACTIONS allow the OPERABLE train to be placed in operation, use of Technical Specification 3.0.4.a is acceptable because the subsequent ACTIONS to be entered following entry into the MODE include ACTIONS (place the OPERABLE train in operation) that permit safe plant operation for an unlimited period of time in the MODE or other specified condition to be entered.

Specification 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

For this reason, Specification 3.0.4.c is typically applied to Specifications which describe values and parameters and may be applied to other Specifications based on NRC plant-specific approval.

The provisions of Specification 3.0.4 should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

The provisions of Specification 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of Specification 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, MODE 3 to MODE 4, and MODE 4 to MODE 5.

Upon entry into a MODE or other specified condition in the Applicability with the LCO not met, Specifications 3.0.1 and 3.0.2 require entry into the applicable LCO and ACTIONS until the Condition is resolved, until the LCO is met, or until the unit is not within the Applicability of the Technical Specification.

Surveillances do not have to be performed on the associated inoperable equipment (or on variables outside the specified limits), as permitted by Specification 4.0.1. Therefore, utilizing Specification 3.0.4 is not a violation of Specification 4.0.1 or 4.0.4 for any Surveillances that have not been performed on inoperable equipment. However, Surveillance Requirements must be met to ensure OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.

Specification 3.0.5 delineates the applicability of each specification to Unit 1 and Unit 2 operation.

Specification 3.0.6 establishes the allowance for restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONS. The sole purpose of this Specification is to provide an exception to LCO 3.0.2 (e.g., to not comply with the applicable Required Action(s)) to allow the performance of surveillance requirements to demonstrate:

a. The OPERABILITY of the equipment being returned to service; or

b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONS is limited to the time absolutely necessary to perform the allowed surveillance requirements. This Specification does not provide time to perform any other preventive or corrective maintenance. Technical Specification 3.0.6 should not be used in lieu of other practicable alternatives that comply with ACTIONS and that do not require changing the MODE or other specified conditions in the Applicability in order to demonstrate equipment is OPERABLE. Technical Specification 3.0.6 is not intended to be used repeatedly.

An example of demonstrating equipment is OPERABLE with the ACTIONS not met is opening a manual valve that was closed to comply with ACTIONS to isolate a flowpath with excessive containment isolation valve leakage in order to perform testing to demonstrate that containment isolation valve leakage is now within limit.

Examples of demonstrating equipment OPERABILITY include instances in which it is necessary to take an inoperable channel or trip system out of a tripped condition that was directed by an ACTION, if there is no ACTIONS Note for this purpose. An example of verifying OPERABILITY of equipment removed from service is taking a tripped channel out of the tripped condition to permit the logic to function and indicate the appropriate response during performance of required testing on the inoperable channel.

Examples of demonstrating the OPERABILITY of other equipment are taking an inoperable channel or trip system out of the tripped condition 1) to prevent the trip function from occurring during the performance of a surveillance requirement on another channel in the other trip system, or 2) to permit the logic to function and indicate the appropriate response during the performance of a surveillance requirement on another channel in the same trip system.

The administrative controls in Technical Specification 3.0.6 apply in all cases to systems or components in Section 3 of the Technical Specifications, as long as the testing could not be conducted while complying with the ACTIONS. This includes the realignment or repositioning of redundant or alternate equipment or trains previously manipulated to comply with ACTIONS, as well as equipment removed from service or declared inoperable to comply with ACTIONS.

Specifications 4.0.1 through 4.0.6 establish the general requirements applicable to Surveillance Requirements. These requirements are based on the Surveillance Requirements stated in the Code of Federal Regulations, 10 CFR 50.36 (c) (3):

"Surveillance requirements are requirements relating to test, calibration, or inspection to ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions of operation will be met."

Specification 4.0.1 establishes the requirement that Surveillances must be performed during the OPERATIONAL MODES or other conditions for which the requirements of the Limiting Conditions for Operation apply unless otherwise stated in an individual Surveillance Requirement. The purpose of this Specification is to ensure that Surveillances are performed to verify the operational status of systems and components and that parameters are within specified limits to ensure safe operation of the facility when the plant is in a MODE or other specified condition for which the associated Limiting Conditions for Operation are applicable.

Systems and components are assumed to be OPERABLE, when the associated Surveillance Requirements (SRs) have been met. Nothing in this Specification, however, is to be construed as implying that systems or components are OPERABLE when:

a. The systems or components are known to be inoperable, although still meeting the SRs; or

b. The requirements of the Surveillance(s) are known not to be met between required Surveillance performances.

Surveillance Requirements do not have to be performed when the facility is in an OPERATIONAL MODE for which the requirements of the associated Limiting Condition for Operation do not apply unless otherwise specified. The Surveillance Requirements associated with a Special Test Exception are only applicable when the Special Test Exception is used as an allowable exception to the requirements of a specification.

Surveillance Requirements do not have to be performed on inoperable equipment because the ACTION requirements define the remedial measures that apply. However, the Surveillance Requirements have to be met to demonstrate that inoperable equipment has been restored to OPERABLE status.

Specification 4.0.2 establishes the limit for which the specified time interval for Surveillance Requirements may be extended. It permits an allowable extension of the normal surveillance interval to facilitate surveillance scheduling and consideration of plant operating conditions that may not be suitable for conducting the surveillance; e.g., transient conditions or other ongoing surveillance or maintenance activities. It also provides flexibility to accommodate the length of a fuel cycle for surveillances performed at each refueling outage and are specified with a 18-month surveillance interval. It is not intended that this provision be used repeatedly to extend surveillance intervals beyond that specified for surveillances not performed during refueling outages. The limitation of Specification 4.0.2 is based on engineering judgment and the recognition that the most probable result of any particular surveillance being performed is verification of conformance with the Surveillance Requirements. This provision is sufficient to ensure that reliability ensured through surveillance activities is not significantly degraded beyond that obtained from the specified surveillance interval.

Specification 4.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a Surveillance has not been performed within the specified surveillance interval. A delay period of up to 24 hours or up to the limit of the specified surveillance interval, whichever is greater, applies from the point in time that it is discovered that the Surveillance has not been performed in accordance with Specification 4.0.2, and not at the time that the specified surveillance interval was not met.

This delay period provides adequate time to perform Surveillances that have been missed. This delay period permits the performance of a Surveillance before complying with Action requirements or other remedial measures that might preclude performance of the Surveillance.

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements.

A missed surveillance can occur in a number of ways. Surveillances may be overlooked as a result of an error in surveillance tracking or a failure to follow procedure. On the other hand, a procedural inadequacy may be discovered that calls into question the results of the last performance of the surveillance. While the surveillance may have been performed within the specified frequency, the procedural inadequacy caused the surveillance to be inadequate or incomplete. For example, past reviews of complex systems, such as the reactor protection system or the engineered safety features actuation system, have identified portions of circuits that have not been fully tested. Similarly, response time test procedure reviews have identified components that have not been properly response time tested. These situations would result in the associated surveillance tests to be considered "missed." (TSTF-IG-06-01, Implementation Guidance for TSTF-358, Revision 6, "Missed Surveillance Requirements").

When a Surveillance with a surveillance interval based not on time intervals, but upon specified unit conditions, operating situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed when specified, Specification 4.0.3 allows for the full delay period of up to the specified surveillance interval to perform the Surveillance. However, since there is not a time interval specified, the missed Surveillance should be performed at the first reasonable opportunity.

Specification 4.0.3 provides a time limit for, and allowances for the performance of, Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

Technical Specification 4.0.3 is only applicable if there is a reasonable expectation the associated equipment is OPERABLE or that variables are within limits, and it is expected that the Surveillance will be met when performed. Many factors should be considered, such as the period of time since the Surveillance was last performed, or whether the Surveillance, or a portion thereof, has ever been performed, and any other indications, tests, or activities that might support the expectation that the Surveillance will be met when performed. An example of the use of Technical Specification 4.0.3 would be a relay contact that was not tested as required in accordance with a particular Surveillance Requirement, but previous successful performances of the Surveillance Requirement included the relay contact; the adjacent, physically connected relay contacts were tested during the Surveillance Requirement performance; the subject relay contact has been tested by another Surveillance Requirement; or historical operation of the subject relay contact has been successful. It is not sufficient to infer the behavior of the associated equipment from the performance of similar equipment. The rigor of determining whether there is a reasonable expectation a Surveillance will be met when performed should increase based on the length of time since the last performance of the Surveillance. If the Surveillance has been performed recently, a review of the Surveillance history and equipment performance may be sufficient to support a reasonable expectation that the Surveillance will be met when performed. For Surveillances that have not been performed for a long period or that have never been performed, a rigorous evaluation based on objective evidence should provide a high degree of confidence that the equipment is OPERABLE. The evaluation should be documented in sufficient detail to allow a knowledgeable individual to understand the basis for the determination.

Failure to comply with specified surveillance interval for the Specification is expected to be an infrequent occurrence. Use of the delay period established by Surveillance Requirement 4.0.3 is a flexibility which is not intended to be used repeatedly to extend Surveillance intervals. While up to 24 hours or the limit of the specified surveillance interval is provided to perform the missed

Surveillance, it is expected that the missed Surveillance will be performed at the first reasonable opportunity The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the Surveillance as well as any plant configuration changes required or shutting the plant down to perform the Surveillance) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to perform the Surveillance. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." This Regulatory Guide addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including plant shutdown. The missed Surveillance should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed Surveillances for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant, this evaluation should be used to determine the safest course of action. All missed Surveillances will be placed in the licensee's Corrective Action Program.

If a Surveillance is not completed within the allowed delay period, then the equipment is considered inoperable or the variable is considered outside the specified limits and the entry into the ACTION requirements for the applicable Limiting Conditions for Operation begins immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and entry into the ACTION requirements for the applicable Limiting Conditions for Operation begins immediately upon the failure of the Surveillance. Completion of the Surveillance within the delay period allowed by this Specification, or within the Allowed Outage Time of the applicable ACTIONS, restores compliance with Specification 4.0.1.

Specification 4.0.4 establishes the requirement that all applicable Surveillance Requirements (SRs) must be met before entry into a MODE or other specified condition in the Applicability.

This Specification ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these systems and components ensure safe operation of the unit. The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

A provision is included to allow entry into a MODE or other specified condition in the Applicability when an LCO is not met due to Surveillance not being met in accordance with Specification 3.0.4.

However, in certain circumstances, failing to meet an SR will not result in Specification 4.0.4 restricting a MODE change or other specified condition change. When a system, subsystem, REACTOR TRIP SYSTEM and ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION (Continued)

The Extended Range, Neutron Flux instrumentation denoted in LCO 3.3.1, Item 7 in Tables 3.3-1 and 4.3-1 is referring to the Gamma-Metrics Shutdown Monitors. The circuitry consists of hardware/software components which are unique to the Shutdown Monitor itself, such as the flux multiplication alarm contacts; as well as hardware which is shared with the Remote Shutdown (LCO 3.3.3.5) and the Accident Monitoring (LCO 3.3.3.6) QDPS Extended range, Neutron Flux instrumentation. Inoperability of the Shutdown Monitors does not affect the Operability of the QDPS Extended Range instrumentation except for reasons of common mode failure. Conversely, inoperability of the QDPS Extended Range instrumentation should be evaluated for common mode failure with respect to the Shutdown Monitor to verify OPERABILITY of the Shutdown Monitor. (CR 97-908-8)

AC and DC power requirements-shutdown for OPERABIITY of Extended Range, Neutron Flux instrumentation are given in Bases Table 3.8-1.

ACTION 5.a addresses the condition of one inoperable channel of extended range neutron flux monitor and provides 72 hours to restore the inoperable channel. In this condition, the second channel provides the monitoring function. If the channel is not restored to operable condition within 72 hours, the action requires suspending positive reactivity changes with the exception of sluicing and flushing operations of the Chemical Volume and Control System cation bed or mixed bed demineralizers, and that reactivity changes from temperature changes or boron dilution be accounted for in the calculated SHUTDOWN MARGIN. In addition if the channel is not restored to operable condition within 72 hours, control rod withdrawal is no longer permitted.

ACTION 5.b addresses the condition of two inoperable channels of extended range neutron flux monitoring instrumentation. In this condition, the UFSAR design basis that the flux multiplication alarm provided by the extended range neutron flux monitor will give the operator 15 minutes to respond to a loss of shutdown margin is not valid since the flux monitor design function is lost.

ACTION 5.b.requires the immediate suspension of all operations involving positive reactivity changes and within 15 minutes isolation of the unborated water flow paths to the reactor coolant system described in Chapter 15.4.6 of the Updated Final Safety Analysis Report to mitigate a boron dilution event. Isolation of these flow paths is achieved by closing valve FCV-110B, in the normal reactor makeup water (RMW) line to the charging pump suction, by closing valve FCV-111B, in the RMW line to the top of the volume control tank, by closing valve CV-0201A, the chemical mixing isolation valve, and by closing valve CV-0221, the alternate emergency boration isolation valve. With two extended range neutron flux monitor channels inoperable, suspension of operations involving positive reactivity changes includes suspension of sluicing and flushing operations of the Chemical Volume and Control System cation bed or mixed bed demineralizers. The loss of function for the neutron flux extended range monitor results in a loss of the operator's ability to detect a loss of shutdown margin. This action restricts operations that could challenge the shutdown margin, and provides assurance that the design basis is met in the unlikely situation that a boron dilution event occurs coincident with the loss of the instrumentation credited in the safety analysis for initiating the operator actions to mitigate the event. The action allows temperature changes provided the change is within the limits of the calculated SHUTDOWN MARGIN. Control rod withdrawal is not allowed.

If at least one channel is not restored to OPERABLE status within 1 hour, ACTION 5.b.1 requires securing within 2 hours each unborated water flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. The method of securing must include the use of at least one isolation barrier

3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION (Continued)

ACTION 40.a. requires restoration within 30 days if a channel of steam line radiation monitoring or steam generator blowdown line radiation monitoring is inoperable, provided there is functional diverse channel. If the channel cannot be restored in the 30 days, a report must be submitted to the NRC outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channel to OPERABLE status. The steam line radiation monitor and the steam generator blowdown radiation monitor are considered to be functionally redundant to one another. The allowed outage time and required action are acceptable based on operating experience, the low likelihood of an event requiring the function, the available functionally redundant channel, and the pre-planned actions defined before loss of function.

ACTION 40.b. requires restoration within 7 days if a channel of steam line radiation monitoring or steam generator blowdown line radiation monitoring is inoperable, and there is no functional diverse channel. *!f* the channel cannot be restored in the 7 days, a report must be submitted to the NRC. The allowed outage time of 7 days is based on the relatively low probability of an event requiring instrument operation and the availability of alternate means to obtain the required information. Prompt restoration of the channel is expected because the alternate indications may not fully meet all performance qualification requirements applied to the instrumentation. Therefore, requiring restoration of one inoperable channel of the function limits the risk that the function will be in a degraded condition should an accident occur.

STP's procedure for monitoring primary to secondary leakage is the pre-planned alternate method that will be implemented for this ACTION.

Reactor Vessel Water Level and Neutron Flux (ACTIONS 41 and 42) Consistent with the wording of LCO 3.3.3.6, all instrumentation channels shown in Table 3.3-10 are required to be operable. Therefore, the Required Number of Channels as described in ACTIONS 41a, 42a, and 42b, are equivalent to the Total Number of Channels as listed in Table 3.3-10.

Extended Range Nuclear Instrumentation (Table 3.3-10, Functions 19 and 23)

Action 42.a requires that with the number of Operable channels one less than the Total Number of Channels requirements, one inoperable channel must be restored to Operable status within 30 days, or a special report must be submitted within the next 14 days outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the inoperable channels to OPERABLE status. The 30-day Allowed Outage Time is acceptable because there is one channel of instrumentation that remains operable, the applicable instrumentation provides indication only (i.e., no automatic actuations are required to occur from the associated instrumentation post-accident), and because of the low probability of an event requiring post-accident monitoring instrumentation during this 30-day interval. The action to submit a special report in lieu of a plant shutdown is acceptable because alternative actions are identified before a loss of functional capability, and given the low likelihood of plant conditions that would require information provided by this instrumentation. The report discusses the results of the cause evaluation of the inoperability and identifies proposed restorative actions.

Action 42.b requires that one inoperable channel must be restored to Operable status within 7 days, or the plant must be placed in Hot Shutdown within the next 12 hours. The 7-day Allowed Outage Time is acceptable because of the low probability of an event requiring post-accident monitoring instrumentation operation and the availability of alternate means to obtain the required information.

3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION (Continued)

Continuous operation with two channels inoperable for any one variable is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the post-accident monitoring instrumentation. Therefore, requiring restoration of one inoperable channel limits the risk that the post-accident monitoring function will be in a degraded condition should an accident occur.

3/4.3.3.7 NOT USED
3/4.3.3.8 NOT USED
3/4.3.3.9 NOT USED
3/4.3.3.10 NOT USED
3/4.3.3.11 NOT USED
3/4.3.4 NOT USED

3/4.3.5 ATMOSPHERIC STEAM RELIEF VALVE INSTRUMENTATION

The atmospheric steam relief valve manual controls must be OPERABLE in Modes 1, 2, 3, and 4 (Mode 4 when steam generators are being used for decay heat removal) to allow operator action needed for decay heat removal and safe cooldown in accordance with Branch Technical Position RSB 5-1.

The atmospheric steam relief valve automatic controls must be OPERABLE with a nominal setpoint of 1225 psig in Modes 1 and 2 because the safety analysis assumes automatic operation of the atmospheric steam relief valves with a nominal setpoint of 1225 psig with uncertainties for mitigation of the small break LOCA. In order to support startup and shutdown activities (including post-refueling low power physics testing), the atmospheric steam relief valves may be operated in manual and open, or in automatic operation, in Mode 2 to maintain the secondary side pressure at or below an indicated steam generator pressure of 1225 psig.

The uncertainties in the safety analysis assume a channel calibration on each atmospheric steam relief valve automatic actuation channel, including verification of automatic actuation at the nominal 1225 psig setpoint, at a frequency found in the Surveillance Frequency Control Program.

3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the reactor coolant ensure that the resulting 2-hour doses at the SITE BOUNDARY will not exceed an appropriately small fraction of 10 CFR Part 100 dose guideline values following a steam generator tube rupture accident in conjunction with an assumed steady-state reactor-to-secondary steam generator leakage rate of 150 gpd per steam generator. The values for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the STPEGS site, such as SITE BOUNDARY location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the reactor coolant's specific activity greater than 1 microCurie/gram DOSE EQUIVALENT I-131, but within the allowable limit 60 microCuries per gram, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

In MODES 1, 2, 3, and 4, operation within the LCO limits for DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 is necessary to limit the potential consequences of a SLB or SGTR to within the acceptance criteria. In MODES 5 and 6, the steam generators are not being used for decay heat removal, the RCS and steam generators are depressurized, and primary to secondary leakage is minimal. Therefore, the monitoring of RCS specific activity is not required.

Action d permits the use of the provisions of LCO 3.0.4.c for ACTION a and b. This allowance permits entry into the applicable MODE(S), relying on Required Actions while the DOSE EQUIVALENT I-131 LCO limit is not met. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient-specific activity excursions while the plant remains at, or proceeds to, power operation.

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of 4 hours must be taken to demonstrate that the specific activity is 60.0 microCurie/gram or less. The Completion Time of 4 hours is required to obtain and analyze a sample. The DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 must be restored to within their respective limit within 48 hours. The Completion Time of 48 hours is acceptable since it is expected that, if there were a spike, the normal coolant concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

SPECIFIC ACTIVITY (Continued)

SR 4.4.8.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant. This measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in the noble gas specific activity. Due to the inherent difficulty in detecting Kr-85 in a reactor coolant sample due to masking from radioisotopes with similar decay energies, such as F-18 and I-134, it is acceptable to include the minimum detectable activity for Kr-85 in the SR 4.4.8.1 calculation. If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 is not detected, it should be assumed to be present at the minimum detectable activity.

The Frequency, between 2 and 6 hours after a power change of 15% RTP or greater within a 1 hour period, is established because the iodine levels peak during this time following iodine spike initiation. Samples at other times would provide inaccurate results.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

The temperature and pressure changes during heatup and cooldown are limited to be consistent with the requirements given in the ASME Boiler and Pressure Vessel Code, Section III, Appendix G:

1. The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figures 3.4-2 and 3.4-3 for the service period specified thereon:

The limitations on minimum water level and maximum temperature are based on providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

3/4.7.6 (NOT USED)

3/4.7.7 CONTROL ROOM MAKEUP AND CLEANUP FILTRATION SYSTEM

The Control Room Makeup and Filtration System is comprised of three 50-percent redundant systems (trains) that share a common intake plenum and exhaust plenum. Each system/train is comprised of a makeup fan, a makeup filtration unit, a cleanup filtration unit, a cleanup fan, a control room air handling unit, a supply fan, a return fan, and associated ductwork and dampers. Two of the three 50% design capacity trains are required to remain operable during an accident to ensure that the system design function is met. The toilet kitchen exhaust (excluding exhaust dampers), heating, and computer room HVAC Subsystem associated with the Control Room Makeup and Filtration System are non safety-related and not required for operability.

The OPERABILITY of the Control Room Makeup and Cleanup Filtration System ensures that: (1) the ambient air temperature does not exceed the allowable temperature for continuous-duty rating for the equipment and instrumentation cooled by this system, and (2) the control room will remain habitable for operations personnel during and following most credible accident conditions. Operation with the heaters on for at least 15 minutes demonstrates OPERABILITY of the system. Periodic operation ensures that heater failure, blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem total effective dose equivalent (TEDE). This limitation is consistent with the requirements of General Design Criterion 19 of Appendix A, 10 CFR Part 50. ANSI N510-1980 will be used as a procedural guide for surveillance testing.

There is no automatic actuation or Surveillance Requirements of the Control Room Makeup and Cleanup Filtration System for toxic gas or smoke because the analysis for the South Texas Project has determined no actuation is required.

The accidents postulated to occur during core alterations, in addition to the fuel handling accident, are: inadvertent criticality (due to a control rod removal error or continuous rod withdrawal error during refueling or boron dilution) and the inadvertent loading of, and subsequent operation with, a fuel assembly in an improper location. These events are not postulated to result in fuel cladding integrity damage. Since the only accident to occur during CORE ALTERATIONS that results in a significant radioactive release is the fuel handling accident and the accident mitigation features of the Control Room Makeup and Cleanup Filtration System are not credited in the accident analysis for a fuel handling accident, there are no OPERABILITY requirements for this system in MODES 5 and 6.

Actions a, b, c, and d

The time limits associated with the ACTIONS to restore an inoperable train to OPERABLE status are consistent with the redundancy and capability of the system and the low probability of a design basis accident while the affected train(s) is out of service.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

required offsite circuit on a more frequent basis. However, if a second required circuits fails 4.8.1.1.1.a, the second offsite circuit is inoperable, and Action e, for two offsite circuits inoperable, is entered.

TS 3.8.1.1 Action b.

To ensure a highly reliable power source remains with one diesel generator inoperable, it is necessary to verify the OPERABILITY of the required offsite circuits on a more frequent basis. However, if a required circuit fails 4.8.1.1.1.a, the offsite circuit is inoperable, and Action c, for one offsite circuit and one diesel generator inoperable, is entered. Action b provides an allowance to avoid unnecessary testing of OPERABLE diesel generators. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generators, and is an independently testable component or an inoperable support system, then surveillance requirement 4.8.1.1.2.a.5) does not have to be performed.

The completion time of 14 days has a combination of deterministic and risk-informed bases justified by the redundancy of the plant design and the extremely low probability of an event that cannot be mitigated by one operable ESF train.

The risk-informed component requires application of the Configuration Risk Management Program (CRMP). The actions described in the procedure assure that the configuration of the plant is within acceptable risk criteria during the time the affected components are inoperable.

The deterministic component provides assurance that the plant retains a substantial capability to migrate design basis events with the reduced capability that results from postulating a design basis accident and a single failure with one ESF train out of service, or from postulating an accident (with no single failure) in the 24 hours allowed for inoperability of required equipment in one of the other trains. This evaluation shows that a single operable ESF train can mitigate (at a reduced capacity in certain cases) the design basis accidents except for a large break LOCA where the break is located in the RCS loop associated with the operating train of safety injection. Because postulation of these events is beyond the design basis of the plant, the deterministic analyses may apply less conservative acceptance criteria than those required of design basis analyses.

For planned SDG out-of-service times exceeding the front-stop completion time and where the risk management action threshold established in the CRMP is expected to be exceeded, station procedures and application of the CRMP require that compensatory actions be implemented in accordance with the Probabilistic Safety Assessment modeling assumptions. In addition to meeting the offsite circuit requirements of Technical Specification 3.8.1.1, compensatory actions are to be implemented in accordance with the CRMP and plant procedures. These actions normally include the following:

- The 138 kV supply through the emergency transformer is functional and available
- The Technical Support Center emergency diesel generator is functional and available
- The positive displacement charging pump is functional and available
- Containment purges are minimized

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

- Maintenance in the switchyard that could directly cause a loss of offsite power is not allowed unless required to assure the continued reliability and availability of the offsite power
- Severe weather that could result in the extended loss of offsite power is not expected

Should one or more of these compensatory requirements not be met during the SDG out-of-service period, action will be taken in accordance with the CRMP to restore the function. If indicated by the risk assessment conducted in accordance with the program, other actions may be taken by station management to reduce risk by restoration of other components, rescheduling work that might increase the risk, or placing the unit in a more appropriate configuration.

If entry into the Action is unplanned (e.g., a failure of the SDG), station procedures require the implementation of the CRMP when the out-of-service time exceeds the risk thresholds established in the CRMP. If one or more of the compensatory requirements is not functional, action will be taken in accordance with the CRMP to restore the function and to manage the risk.

TS 3.8.1.1 Action c.

To ensure a highly reliable power source remains with one offsite circuit and one diesel generator inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. However, if a second required circuit fails 4.8.1.1.1.a, the second offsite circuit is inoperable and LCO 3.0.3 should be entered. Action c provides an allowance to avoid unnecessary testing of OPERABLE diesel generators. If it can be determined that the cause of the inoperable diesel generator does not exist on the OPERABLE diesel generators, and is an independently testable component or an inoperable support system, then surveillance requirement 4.8.1.1.2.a.5) does not have to be performed.

TS 3.8.1.1 Action d.

This action provides assurance that a loss of offsite power, during the period that a diesel generator is inoperable, does not result in a complete loss of safety function of critical systems. In this condition the remaining OPERABLE diesel generators and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may be lost; however, function has not been lost. Discovering one required diesel generator inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the operable diesel generator, results in starting the completion time for the required action. Discovery of subsequent inoperable required support or supported features, or both, that are associated with the operable diesel generator, results in starting a separate completion time for the required action. If the required number of channels or trains for a function or component is less than the total number of channels or trains and the TS allow unlimited operation with less than the total number of channels or trains (e.g. some Remote Shutdown System functions), then as long as there is emergency power for at least the required number of channels or trains, the requirements of TS 3.8.1.1.d are met. Similarly, if only one Reactor Containment Fan Cooler, out of six available, is inoperable, then there are no restrictions applied on the diesel generators and Action statement 3.8.1.1(d) (1) can be met.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

Surveillance Requirements

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18. Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The Technical Specification Surveillance Requirements (SRs) for demonstrating the OPERABILITY of the standby diesel generators are in accordance with the recommendations of Regulatory Guide 1.108, Regulatory Guide 1.137, as addressed in the FSAR and NUREG-1431.

SR 4.8.1.1.1.a

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution busses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The frequency specified in the Surveillance Frequency Control Program is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

SR 4.8.1.1.1.b

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that the components usually pass the SR when performed at a frequency found in the Surveillance Frequency Control Program. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 4.8.1.1.2.a.1

This SR provides verification that the level of fuel oil in the fuel tank is at or above the required level.

SR 4.8.1.1.2.a.2 and SR 4.8.1.1.2.a.5

These SR helps to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

For purposes of this testing, the DGs are started from standby conditions. Standby condition for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

A.C. SOURCES, D. C. SOURCES, AND ONSITE POWER DISTRIBUTION (Continued)

In order to reduce stress and wear on diesel engines, some manufacturers recommend a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. In addition, the modified start may involve reduced fuel (load limit). These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer.

At a frequency found in the Surveillance Frequency Control Program, SRs 4.8.1.1.2.a.2 and 4.8.1.1.2.a.5 require that the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR.

The 10 second start requirement is not applicable to SR 4.8.1.1.2.a.2 (see Note 3) when a modified start procedure as described above is used.

The criteria that in ≤ 10 seconds the DG achieves 4160 ±416 volts and 60 ± 1.2 Hz when the DG is started from a standby condition are starting and accelerating design criteria for the DG and are specified to confirm the capability of the DG to recover from a loading transient.

SR 4.8.1.1.2.a.5 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

The frequency specified in the Surveillance Frequency Control Program for SR 4.8.1.1.2.a is consistent with Regulatory Guide 1.108 and Generic Letter 94-01. The frequency specified in the Surveillance Frequency Control Program for SR 4.8.1.1.2.a.5 is a reduction in cold testing consistent with Generic Letter 84-15. These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

SR 4.8.1.1.2.a.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperature, while minimizing the time that the DG is connected to the offsite source.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

A.C. SOURCES, D. C. SOURCES, AND ONSITE POWER DISTRIBUTION (Continued)

This SR is modified by two Notes. Note 4 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 6 states that momentary transients, because of changing bus loads, do not invalidate this test.

A successful DG start under SR 4.8.1.1.2.a.2 must precede this test to credit satisfactory performance.

SR 4.8.1.1.2.b

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil tanks at a frequency found in the Surveillance Frequency Control Program eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137. This SR is for preventative maintenance. The presence of water does not necessarily represent failure of the SR, provided the accumulated water is removed during the performance of this Surveillance.

SR 4.8.1.1.2.c

The requirements will be controlled and administered by the Diesel Fuel Oil Testing Program located in section 6.8.3 of Administrative Controls.

SR 4.8.1.1.2.e.1 NOT USED

SR 4.8.1.1.2.e.2

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load (785.3 kW) without exceeding predetermined voltage and frequency. The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendation of Regulatory Guide 1.108.

This SR is modified by two Notes. Note 4 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 5 allows the diesel start for this surveillance to be a modified start as stated in SR 4.8.1.1.2.a.2.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

SR 4.8.1.1.2.e.3

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendation of Regulatory Guide 1.108 and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by two Notes. Note 4 indicates that diesel engine runs for this Surveillance may include gradual loading as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 5 allows the diesel start for this surveillance to be a modified start as stated in SR 4.8.1.1.2.a.2.

SR 4.8.1.1.2.e.4

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a(l), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency busses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The frequency should be restored to within 2% of nominal following a load sequence step. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendations of Regulatory Guide 1.108, paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

SR 4.8.1.1.2.e.4 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

SR 4.8.1.1.2.e.5

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (10 seconds) from the design basis actuation signal (LOCA signal) and operates $\geq$ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability.

The frequency specified in the Surveillance Frequency Control Program takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths.

The criteria that in ≤ 10 seconds the DG achieves 4160 ±416 volts and 60 ± 1.2 Hz when the DG is started from a standby condition are starting and accelerating design criteria for the DG and are specified to confirm the capability of the DG to recover from a loading transient.

SR 4.8.1.1.2.e.5 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

SR 4.8.1.1.2.e.6

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

This surveillance also demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, and low lube oil pressure) are operable. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

SR 4.8.1.1.2.e.6 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

The frequency specified in the Surveillance Frequency Control Program takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 18 months. Operating experience has shown that these components usually pass the SR when performed at a frequency found in the Surveillance Frequency Control Program. Therefore, the frequency specified in the Surveillance Frequency Control Program was concluded to be acceptable from a reliability standpoint.

SR 4.8.1.1.2.e.7

Regulatory Guide 1.108, paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, $\geq$ 2 hours of which is at a load equivalent to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

This Surveillance also demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendation of Regulatory Guide 1.108, paragraph 2.a.(5).

The criteria that in ≤ 10 seconds the DG achieves 4160 ± 416 volts and 60 ± 1.2 Hz when the DG is started from a standby condition are starting and accelerating design criteria for the DG and are specified to confirm the capability of the DG to recover from a loading transient.

SR 4.8.1.1.2.e.7 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendations of Regulatory Guide 1.108, paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by three Notes. Note 4 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 5 allows the diesel start for this surveillance to be a modified start as stated in SR 4.8.1.1.2.a.2. Note 6 states that momentary transients, because of changing bus loads, do not invalidate this test.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

SR 4.8.1.1.2.e.11

As required by Regulatory Guide 1.108, paragraph 2.a.(2), each DG is required to demonstrate proper operation for the DBA loading sequence to ensure that voltage and frequency are maintained within the required limits. Under accident conditions, prior to connecting the DGs to their respective busses, all loads are shed except load center feeders and those motor control centers that power Class 1E loads (referred to as "permanently connected" loads). Upon reaching 90% of rated voltage and frequency, the DGs are then connected to their respective busses.

Loads are then sequentially connected to the bus by the automatic load sequencer. This sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The 10% load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated.

The sequencer is considered a support system for the associated diesel generator and those components actuated by a Mode 1 signal (CR 00-10707).

The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendation of Regulatory Guide 1.108, paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

SR 4.8.1.1.2.e.12

This SR verifies that the diesel will not start when the emergency stop lockout feature is tripped. This prevents any further damage to the diesel engine or generator.

SR 4.8.1.1.2.e.13

This SR verifies the requirements of Branch Technical Position PSB-1 that the load shedding scheme automatically prevents load shedding during the sequencing of the emergency loads to the bus. It also verifies the reinstatement of the load shedding feature upon completion of the load sequencing action.

SR 4.8.1.1.2.f

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The criteria that in ≤ 10 seconds the DG achieves 4160 ± 416 volts and 60 ± 1.2 Hz when the DG is started from a standby condition are starting and accelerating design criteria for the DG and are specified to confirm the capability of the DG to recover from a loading transient.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

SR 4.8.1.1.2.e.5 also demonstrates that the DG can achieve steady-state voltage and frequency within the specified band around the nominal values of 4160 volts and 60 Hz. The band placed around these nominal values is based on the capability of the voltage regulator and governor. WCAP-17308-NP-A contains the methodology for evaluating the impact of variations in voltage and frequency, due to the voltage regulator and governor, on the following:

- Pump flow and developed head to meet design basis requirements,
- DG loading calculations,
- DG fuel consumption calculations, and
- Motor Operated Valve (MOV) performance.

The frequency specified in the Surveillance Frequency Control Program is consistent with the recommendations of Regulatory Guide 1.108, paragraph 2.b, and Regulatory Guide 1.137, paragraph C.2.f.

SR 4.8.1.1.2.g

This SR provided assurance that any accumulation of sediment over time or the normal wear on the system has not degraded the diesels.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," Revision 2, December 1979; 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977; and ASTM D975-81, ASTM D1552-79, ASTM D262282, ASTM D4294-83, and ASTM D2276-78. The standby diesel generators auxiliary systems are designed to circulate warm oil and water through the diesel while the diesel is not running, to preclude cold ambient starts. For the purposes of surveillance testing, ambient conditions are considered to be the hot prelube condition.

3.8.1.3

The OPERABILITY of the minimum AC sources during MODE 6 with ≥23' of water in the cavity is based on the following conditions:

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

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