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

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Attention: 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, 2015 to June 16, 2017. For the Technical Specification bases page revised more than once during the reporting period, only the most recent page is included in this submittal.

Page	Amendment	Description of Change
B 3/4 3-3a, B 3/4 3-3b, B 3/4 3-3c	15-15822-1	Revised the bases to provide additional information following NRC approval of Amendment 205 for Unit 1 and Amendment 193 for Unit 2 regarding the required actions and allowed outage times for inoperable reactor trip breakers.
B 3 /4 4-3a, B 3 /4 4-3c, B 3 /4 4-3d	15-15822-5	Revised the bases to provide additional information following NRC approval of Amendment 209 for Unit 1 and Amendment 196 for Unit 2 regarding steam generator tube inspections and reporting requirements
B 3/4 6-1a, B 3/4 6-1b	15-15822-6	Revised the bases to provide clarification regarding the requirement for inoperable containment air lock.
B 3/4 6-1a	15-15822-7	Revised the bases to provide clarification on the requirements for containment entry under the control of a dedicated individual while in Action b.

STI: 34518517

There are no commitments in this letter.

If you have any questions on this matter, please contact Marilyn Kistler at (361) 972-8385.

Peggy Lofton Travis for

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Attachment: Revised Bases Pages

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Revised Bases Pages

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

safety feature is maintained, then the TS requirements may be limited to those of the applicable system specification for a single inoperable train.

The purpose of ESFAS actuation logic and relays is to initiate the integrated system response that accomplishes the design safety function of the applicable engineered safety feature (ESF). Slave relays actuate individual components within systems that comprise the various ESFs. The application of slave relays varies from actuation of a single component within a system to multiple components that are shared among systems, and hence, the inoperability of a slave relay could impact one or more components that perform functions in one or more ESFs.

In the case where the impact of an inoperable slave relay failure on a system performing ESF functions is no more severe than a single train within that system not being capable of performing its safety function, then the failure does not conflict with the actuation relays TS requirements because the ability to initiate the integrated system response for the ESF is maintained. In this case, the failure of the slave relay would result only in the loss of the capability to actuate limited aspects of a system, where the collective impact of the slave relay inoperability would be no more severe than the inoperability of a single train in the system. The appropriate TS requirements to be applied under these conditions are limited to those of the system specification. The loss of that ability due to the slave relay inoperability must be completely within the conditions provided by the TS for a single train being inoperable, whether in the statement of the LCO or in the allowed outage configuration(s) as provided in the action statements.

For example, if a slave relay inoperability resulted in only Train A of containment spray incapable of being actuated by ESFAS, this condition would be no more severe than a component in the train being inoperable. In this case, the TS requirements for an inoperable train of containment spray should be applied. In this case it would be unnecessarily conservative to apply the 24 hour actuation relay TS AOT. The application of the 24 hour AOT could result in an unnecessary shutdown and the associated plant transient and increased risk of operating events associated with plant transients.

Note that for the case where a component is actuated by redundant ESFAS actuation trains, failure of a single slave relay would not make the component (e.g., main steam isolation valve) incapable of performing its safety function since the redundant actuation channel remains operable. In this case, the TS requirement for a single actuation relay train applies.

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

Reactor Trip Breakers

Two reactor trip breakers (RTB) arranged in series connect three-phase ac power from the rod drive motor generator sets to the rod drive power cabinets supplying power to the control rod drive mechanisms (CRDM). Opening of the RTBs interrupts power to the CRDMs and allows the shutdown rods and control rods to fall into the core by gravity. Each RTB is equipped with a bypass breaker to allow testing of the RTB while the unit is at power.

During normal operation the output from the solid state protection system (SSPS) provides a direct voltage signal to the undervoltage coil on each reactor trip breaker and bypass breakers, if in use. Direct current holds a trip plunger out against its spring, allowing ac power to be available at the rod drive power cabinets. SSPS consists of two logic trains, each capable of opening a separate and independent reactor trip breaker. SSPS takes binary inputs (i.e. voltage or no-voltage) from the process and nuclear instrumentation channels corresponding to conditions of plant parameters. When a required logic combination is completed, a reactor trip signal (i.e. no voltage) is generated to the undervoltage trip coil. In addition, the reactor trip signal energizes the shunt trip auxiliary relay coils of the RTBs to trip the breakers open. The shunt trip auxiliary relay coils provide a diverse means to trip the RTBs. When any one train of RTBs is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed.

The LCO for Table 3.3-1, Functional Unit 20 requires two OPERABLE channels (trains) of trip breakers. A trip breaker channel (train) consists of the normal trip breaker associated with a single RTS logic train that are racked in, closed, and capable of supplying power to the Rod Control System. Two OPERABLE trains ensure no single random failure can disable the RTS trip capability.

The LCO for Table 3.3-1, Functional Unit 20 requires both diverse trip features (undervoltage and shunt trip attachment) to be OPERABLE for each RTB that is in service. The diverse trip features are not required to be OPERABLE for trip breakers that are open, racked out, incapable of supplying power to the Control Rod Drive System, or declared inoperable. OPERABILITY of both diverse trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal.

The diverse trip features for Functional Unit 20 must be OPERABLE in MODE 1 or 2. In MODE 3, 4, or 5, the diverse trip feature for Functional Unit 20 must be OPERABLE when the RTBs are closed and the Control Rod Drive System is capable of rod withdrawal.

ACTION 9 applies to the RTB trains in MODES 1 and 2. This action addresses the train orientation of the Reactor Trip System for the RTBs. With one train inoperable, 24 hours are allowed for train corrective maintenance to restore the train to OPERABLE status or the Unit must be placed in MODE 3 within the next 6 hours. The 24 hours allowed to restore the inoperable RTB train to OPERABLE status is justified in WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times", March 2003. The completion time of 6 hours to reach MODE 3 from full power in an orderly manner and without challenging Unit systems is

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

reasonable based on operating experience. With the Unit in MODE 3, ACTION 10 would apply to any inoperable RTB trip mechanism. ACTION 9 is modified to allow bypassing one train up to 4 hours for surveillance testing, provided the other train is OPERABLE. The 4 hour time limit for RTB testing is justified in WCAP-15376-P-A, Revision 1, "Risk-Informed Assessment of the RTS and ESFAS Surveillance Test Intervals and Reactor Trip Breaker Test and Completion Times", March 2003. The Conditions and Limitations of the NRC Safety Evaluation for WCAP-15376, published as part of WCAP-15376-P-A, Revision 1, for extending the allowed outage time and bypass test time for RTBs are met.

ACTION 12 applies to the RTB diverse trip features (undervoltage and shunt trip attachment) in MODES 1 and 2. With one of the diverse trip features inoperable, it must be restored to an OPERABLE status within 48 hours or the unit must be placed in a MODE where the requirement does not apply. This is accomplished by placing the unit in MODE 3 within the next 6 hours (54 hours total time). The completion time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging Unit systems. With the Unit in MODE 3, ACTION 10 would apply to any inoperable RTB trip feature. The affected RTB shall not be bypassed while one of the diverse features is inoperable except for the time required to perform maintenance to one of the diverse features. The allowable time for performing maintenance of the diverse features is limited by the ACTION 9 allowance for one channel to be bypassed for up to 4 hours for surveillance testing. The AOT of 48 hours is reasonable considering that in this Condition there is one remaining diverse feature for the affected RTB, and one OPERABLE RTB capable of performing the safety function and given the low probability of an event occurring during this interval.

ACTION 10 applies to the following reactor trip functions in MODE 3, 4, or 5 when the RTBs are in the closed position and Control Rod Drive System capable of rod withdrawal:

- Functional Unit 1, Manual Reactor Trip,
- Functional Unit 20, RTBs that include diverse trip features, and
- Functional Unit 21, Automatic Trip and Interlock Logic

With one channel or train inoperable, the inoperable channel or train must be restored to OPERABLE status within 48 hours. If the affected Function(s) cannot be restored to OPERABLE status within the allowed 48 hour allowed outage time (AOT), the Unit must be placed in a MODE in which the requirement does not apply. To achieve this status, action must be initiated within the same 48 hours to ensure that all rods are fully inserted, and the Rod Control System must be placed in a condition incapable of rod withdrawal within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With rods fully inserted and the Control Rod Drive System incapable of rod withdrawal, these Functions are no longer required. The AOT is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 NOT USED

3/4.4.5 STEAM GENERATOR TUBE INTEGRITY (Continued)

The processes used to meet the SG performance criteria are defined by the Steam Generator Program Guidelines (Ref. 1).

Applicable Safety Analyses

The steam generator tube rupture (SGTR) accident is the limiting design basis event for SG tubes and avoiding an SGTR is the basis for this Specification. The analysis of a SGTR event assumes a bounding primary-to-secondary leakage rate equal to the operational leakage rate limits in LCO 3.4.6.2, "Reactor Coolant System Operational Leakage," plus the leakage rate associated with a double-ended rupture of a single tube. The accident analysis for a SGTR assumes the contaminated secondary fluid is released via the main steam safety valves. The majority of the activity released to the atmosphere results from the tube rupture.

The analysis for design basis accidents and transients other than a SGTR assume the SG tubes retain their structural integrity (i.e., they are assumed not to rupture). In these analyses, the steam discharge to the atmosphere is based on the total primary-to-secondary leakage from all SGs of 1 gpm as a result of accident induced conditions. For accidents that do not involve fuel damage, the primary coolant activity level of DOSE EQUIVALENT 1-131 is assumed to be equal to the limits in LCO 3.4.8, "Reactor Coolant System Specific Activity." For accidents that assume fuel damage, the primary coolant activity is a function of the amount of activity released from the damaged fuel. The dose consequences of these events are within the limits of GDC 19 (Ref. 2), 10 CFR 100 (Ref. 3) or the NRC approved licensing basis (e.g., a small fraction of these limits).

Steam generator tube integrity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

Limiting Condition for Operation (LCO)

The LCO requires that SG tube integrity be maintained. The LCO also requires that all SG tubes that satisfy the plugging criteria be plugged in accordance with the Steam Generator Program.

During an SG inspection, any inspected tube that satisfies the Steam Generator Program plugging criteria is removed from service by plugging. If a tube was determined to satisfy the plugging criteria but was not plugged, the tube may still have tube integrity. Refer to Action a. below.

In the context of this Specification, a SG tube is defined as the entire length of the tube, including the tube wall between the tube-to-tubesheet weld at the tube inlet and the tube-to-tubesheet weld at the tube outlet. The tube-to-tubesheet weld is not considered part of the tube.

A SG tube has tube integrity when it satisfies the SG performance criteria. The SG performance criteria are defined in Specification 6.8.3.o and describe acceptable SG tube performance. The Steam Generator Program also provides the evaluation process for determining conformance with the SG performance criteria.

3/4.4.5 STEAM GENERATOR TUBE INTEGRITY (Continued)

ACTIONS may allow for continued operation, and subsequent affected SG tubes are governed by subsequent Condition entry and application of associated required ACTIONS.

a. The condition applies if it is discovered that one or more SG tubes examined in an inservice inspection satisfy the tube plugging criteria but were not plugged in accordance with the Steam Generator Program as required by Surveillance Requirement 4.4.5.2. An evaluation of SG tube integrity of the affected tube(s) must be made. Steam generator tube integrity is based on meeting the SG performance criteria described in the Steam Generator Program. The SG plugging criteria define limits on SG tube degradation that allow for flaw growth between inspections while still providing assurance that the SG performance criteria will continue to be met. In order to determine if a SG tube that should have been plugged has tube integrity, an evaluation must be completed that demonstrates that the SG performance criteria will continue to be met until the next SG tube inspection. The tube integrity determination is based on the estimated condition of the tube at the time the situation is discovered and the estimated growth of the degradation prior to the next SG tube inspection. If it is determined that tube integrity is not being maintained, the plant must be shut down in accordance with the ACTION.

Seven days is sufficient to complete the evaluation while minimizing the risk of plant operation with a SG tube that may not have tube integrity.

If the evaluation determines that the affected tube(s) have tube integrity, the ACTION statement allows plant operation to continue until the next refueling outage or SG inspection provided the inspection interval continues to be supported by an operational assessment that reflects the affected tubes. However, the affected tube(s) must be plugged prior to entering MODE 4 following the next refueling outage or SG inspection. This is acceptable since operation until the next inspection is supported by the operational assessment.

a. and b. Six hours to reach HOT STANDBY and an additional 30 hours to reach COLD SHUTDOWN are reasonable, based on operating experience, to reach the desired plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Surveillance Requirements

4.4.5.1 During shutdown periods the SGs are inspected as required by this SR and the Steam Generator Program. NEI 97-06, Steam Generator Program Guidelines (Ref. 1), and its referenced EPRI Guidelines, establish the content of the Steam Generator Program. Use of the Steam Generator Program ensures that the inspection is appropriate and consistent with accepted industry practices.

A condition monitoring assessment of the SG tubes is performed during SG inspections. The condition monitoring assessment determines the "as found" condition of the SG tubes. The purpose of the condition monitoring assessment is to ensure that the SG performance criteria have been met for the previous operating period.

3/4.4.5 STEAM GENERATOR TUBE INTEGRITY (Continued)

The Steam Generator Program determines the scope of the inspection and the methods used to determine whether the tubes contain flaws satisfying the tube plugging criteria. Inspection scope (i.e., which tubes or areas of tubing within the SG are to be inspected) is a function of existing and potential degradation locations. The Steam Generator Program also specifies the inspection methods to be used to find potential degradation. Inspection methods are a function of degradation morphology, nondestructive examination (NDE) technique capabilities, and inspection locations.

The Steam Generator Program defines the frequency of SR 4.4.5.1. The frequency is determined by the operational assessment and other limits in the SG examination guidelines (Ref. 6). The Steam Generator Program uses information on existing degradations and growth rates to determine an inspection frequency that provides reasonable assurance that the tubing will meet the SG performance criteria at the next scheduled inspection. In addition, Specification 6.8.3.o contains prescriptive requirements concerning inspection intervals to provide added assurance that the SG performance criteria will be met between scheduled inspections. If crack indications are found in any SG tube, the maximum inspection interval for all affected and potentially affected SGs is restricted by Specification 6.8.3.o until subsequent inspections support extending the inspection interval.

4.4.5.2 During an SG inspection, any inspected tube that satisfies the Steam Generator Program repair criteria is removed from service (by plugging). The tube plugging criteria delineated in Specification 6.8.3.o are intended to ensure that tubes accepted for continued service satisfy the SG performance criteria with allowance for error in the flaw size measurement and for future flaw growth. In addition, the tube plugging criteria, in conjunction with other elements of the Steam Generator Program, ensure that the SG performance criteria will continue to be met until the next inspection of the subject tube(s). Reference 1 and Reference 6 provide guidance for performing operational assessments to verify that the tubes remaining in service will continue to meet the SG performance criteria.

The frequency of "Prior to entering HOT SHUTDOWN following a steam generator tube inspection" ensures that the Surveillance has been completed and all tubes meeting the repair criteria are plugged prior to subjecting the SG tubes to significant primary-to-secondary pressure differential.

References

1. NEI 97-06, "Steam Generator Program Guidelines"
2. 10 CFR 50 Appendix A, GDC 19
3. 10 CFR 100
4. ASME Boiler and Pressure Vessel Code, Section III, Subsection NB
5. Draft Regulatory Guide 1.121, "Basis for Plugging Degraded Steam Generator Tubes," August 1976
6. EPRI Report, "Pressurized Water Reactor Steam Generator Examination Guidelines"

3/4.6.1.3 CONTAINMENT AIR LOCKS (continued)

ACTION a. is only applicable when one air lock door is inoperable. With only one air lock door inoperable, the remaining OPERABLE air lock door must be verified closed within 1 hour. This ensures a leak tight containment barrier is maintained by use of the remaining OPERABLE air lock door. The 1 hour requirement is consistent with the requirements of Technical Specification 3.6.1.1 to restore CONTAINMENT INTEGRITY. In addition, the remaining OPERABLE air lock door must be locked closed within 24 hours and then verified periodically to ensure an acceptable containment leakage boundary is maintained. Otherwise, a plant shutdown is required.

ACTION b. is only applicable when the air lock door interlock mechanism is inoperable. With only the air lock interlock mechanism inoperable, an OPERABLE air lock door must be verified closed within 1 hour. This ensures a leak tight containment barrier is maintained by use of an OPERABLE air lock door. The 1 hour requirement is consistent with the requirements of Technical Specification 3.6.1.1 to restore CONTAINMENT INTEGRITY. In addition, an OPERABLE air lock door must be locked closed within 24 hours and then verified periodically to ensure an acceptable containment leakage boundary is maintained. Otherwise, a plant shutdown is required. In addition, entry into and exit from containment under the control of a dedicated individual stationed at the air lock to ensure that only one door is opened at a time (i.e., the individual performs the function of the interlock) is permitted. The Note prior to the ACTION requirements does not preclude entry into and exit from the containment (regardless of the reason for the entry/exit) under the control of a dedicated individual while ACTION b. is being applied.

ACTION c. is applicable when the containment air lock is inoperable for any reason other than only one air lock door inoperable (ACTION a.) or only the air lock interlock mechanism inoperable (ACTION b.) (e.g., both air locks inoperable; one air lock door and the air lock interlock mechanism inoperable). When entering ACTION c., an evaluation of the overall containment leakage rate per Specification 3.6.1.2 shall be initiated immediately, and an air lock door must be verified closed within 1 hour. An evaluation is acceptable since it is overly conservative to immediately declare the containment inoperable if both doors in the air lock have failed a seal test or if overall air lock leakage is not within limits. In many instances (e.g., only one seal per door has failed), containment remains OPERABLE, yet only 1 hour (per Specification 3.6.1.1) would be provided to restore the air lock to OPERABLE status prior to requiring a plant shutdown. In addition, even with both doors failing the seal test, the overall containment leakage rate can still be within limits. The 1 hour requirement is consistent with the requirements of Technical Specification 3.6.1.1 to restore CONTAINMENT INTEGRITY. In addition, the air lock and/or at least one air lock door must be restored to OPERABLE status within 24 hours or a plant shutdown is required. The specified time period is considered reasonable for restoring an inoperable air lock to OPERABLE status, assuming that at least one door is maintained closed in each affected air lock.

3/4.6.1.4 INTERNAL PRESSURE

The limitations on containment internal pressure ensure that: (1) the containment structure is prevented from exceeding its design negative pressure differential with respect to the outside atmosphere of 3.5 psig, and (2) the containment peak pressure does not exceed the design pressure of 56.5 psig during LOCA or steam line break conditions.

The maximum peak pressure expected to be obtained from LOCA or steam line break event is 41.2 psig (P_a). The limit of 0.3 psig for initial positive containment pressure will limit the total pressure to 41.2 psig, which is less than design pressure and is consistent with the safety analyses.