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

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10 CFR 50.4
10 CFR 50.71(e)

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, 2017 to June 16, 2019. 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 5-3, B 3/4 5-4, B 3/4 5-5, B 3/4 6-3, B 3/4 6-3a, B 3/4 6-3b, B 3/4 6-3c	17-18282-2	Revised to provide additional information following NRC approval of Amendment 212 for Unit 1 and Amendment 198 for Unit 2 regarding GSI-191 implementation.
B 3/4 2-4, B 3/4 2-4a	17-18282-3	Revised to provide additional information following NRC approval of Amendment 213 for Unit 1 and Amendment 199 for Unit 2 regarding Fxy requirements
B 3/4 8-4a	14-19810-1	Revised to provide clarification regarding the requirement for Technical Specification 3.8.1.1 Action d re-entry.

There are no commitments in this letter.

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

Lance P. Sterling
Manager, Regulatory Affairs

Attachment: Revised Bases Pages

STI: 34866089

cc:

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Attachment

Revised Bases Pages

HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

c. The control rod insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are maintained; and

d. The axial power distribution, expressed in terms of AXIAL FLUX DIFFERENCE, is maintained within the limits.

$F^N_{\Delta H}$ will be maintained within its limits provided Conditions a. through d. above are maintained. The combination of the RCS flow requirement (TS 3.2.5) and the requirement on $F^N_{\Delta H}$ guarantees that the DNBR used in the safety analysis will be met. The relaxation of $F^N_{\Delta H}$ as a function of THERMAL POWER allows changes in the radial power shape for all permissible rod insertion limits.

An allowance for measurement uncertainty must be made for $F^N_{\Delta H}$ measurements. If the moveable incore detector system is used to obtain the measurement, the correct measurement uncertainty is presented in the COLR. The appropriate measurement uncertainty for $F^N_{\Delta H}$ using the Power Distribution Monitoring System (PDMS) is developed using methodology described in WCAP 12472-P-A. Information on the PDMS uncertainty calculation is contained in the COLR. The PDMS will automatically calculate and apply the correct measurement uncertainty to the measured $F^N_{\Delta H}$.

Fuel rod bowing reduces the value of DNB ratio. Margin has been maintained between the DNBR value used in the safety analyses and the design limit to offset the rod bow penalty and other penalties which may apply.

An allowance for both experimental error and manufacturing tolerance must be made when an F_Q measurement is taken. If the moveable incore detector system is used to obtain the measurement, the correct allowances to be applied to the measurement are specified in the COLR. If the PDMS is used, the tolerances are calculated using methods described in WCAP 12472-P-A. Information on the PDMS measurement uncertainty and tolerance allowance is presented in the COLR. The PDMS automatically applies the appropriate measurement uncertainty and manufacturing allowance to the measured F_Q.

The Radial Peaking Factor, F_{XY} (Z), is measured periodically to provide assurance that the Hot Channel Factor, F_Q (Z), remains within its limit. The F_{xy} limit for RATED THERMAL POWER (F^{RTP}_{xy}) as provided in the Core Operating Limits Reports (COLR) per Specification 6.9.1.6 was determined from expected power control maneuvers over the full range of burnup conditions in the core.

Fxy evaluations are not applicable in the excluded zones at the top and bottom of the core, at grid locations, or near the Control Bank D RCCA demand position. These core regions are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions.

HEAT FLUX HOT CHANNEL FACTOR and NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

Due to axial fuel features of the reactor fuel used at STP (e.g. annular pellets, axial blankets with reduced enrichment, Integral Fuel Burnable Absorbers (IFBA) and cutback zones between IFBA, and axial blanket regions) limiting peaking factor margins can potentially occur in the top and bottom exclusion zones. This could result in a change to the exclusion zones if limiting peaks are identified in the formerly excluded region.

The amount of the axial core region that may be excluded during the performance of Surveillance Requirement 4.2.2.2.f. may be reduced on a cycle-specific basis as determined during the core reload design process. The specific exclusion zones for each Unit and cycle are identified in the COLRs.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

Specification 3.5.3.1 Action d prohibits the application of Specification 3.0.4.b to an inoperable ECCS high head subsystem when entering MODE 4. There is an increased risk associated with entering MODE 4 from MODE 5 with an inoperable ECCS high head subsystem and the provisions of Specification 3.0.4.b, which allow 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, should not be applied in this circumstance.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that, at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for flow testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA.

GSI-191 and GL 2004-02 considerations

The OPERABILITY of the ECCS Subsystems is assured by the capability of the containment emergency sump strainers to limit entry of debris into the sump and recirculating lines. This capability ensures that the flow and net positive suction head requirements of ECCS are satisfied. Assurance that containment debris will not block the sump strainers and render the ECCS Subsystem inoperable on emergency recirculation during design basis accidents is provided by inspection and engineering evaluation. UFSAR Appendix 6A provides a risk-informed approach that addresses the potential of debris blockage concluding that long-term core cooling following a design basis loss of coolant accident is assured with high probability. UFSAR Appendix 6A also provides guidance for assessing the potential impact on Operability due to unexpected material such as loose debris discovered in containment that may contribute to debris loading on the strainers.

Technical Basis:

The Licensing Basis with regard to effects of debris is that there is a high probability that ECCS and CSS can perform their design basis functions based on successful plant-specific prototypical testing using deterministic NRC-approved assumptions, and that the risk from breaks that could generate debris that is not bounded by the testing is very small and acceptable in accordance with the criteria of RG 1.174.

STP evaluated the risk associated with the effects on long-term cooling due to debris accumulation on Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) sump strainers in recirculation mode, as well as core flow blockage due to in-vessel effects of debris that penetrates the strainers. A full spectrum of postulated LOCAs is analyzed, including double-ended guillotine breaks (DEGBs) for all pipe sizes up to the largest pipe in the reactor coolant system. The changes to CDF and LERF associated with the effects of debris are quantified by applying the LOCA frequencies published in NUREG-1829, and then compared to RG 1.174 acceptance guidelines. The STP analysis shows that the contribution to risk from the breaks that are not deterministically mitigated is within RG 1.174 Region III.

Strainer Operability:

The affected ECCS and CSS are OPERABLE with respect to the effects of debris when the expected effects of the debris on the emergency sump strainers are consistent with the analysis. This operability requirement is based on quantity and characteristics and location of the debris in the RCB being consistent with the debris analysis assumptions. The types of debris considered in the analysis included insulation and latent debris fiber fines, particulate from coatings and latent debris, and chemical precipitates (primarily from aluminum corrosion).

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

Strainer operability evaluation is fundamentally deterministic and the intent is to not require a risk assessment to make the operability determination. The criterion recognizes that there is margin and conservatism in the debris assumptions used for the deterministic testing and in the debris generation and transport analyses that can be applied to account for previously unidentified debris.

Guidance for evaluating potential debris is provided in 0PSP03-XC-0002 and 0PSP03-XC-0002A.

Applicability:

This required action applies only for the potential effects of debris on emergency sump strainer operability or on in-core debris effects. It does not apply for effects other than those caused by debris. Debris effects are conditions caused by transportable debris that could impact the net positive suction head or otherwise degrade pump performance, or cause strainer structural failure by excess accumulation on one or more of the emergency sump strainers. Obstructions or covers on the strainers such as tarps, gaps or other conditions that are a physical degraded or nonconforming condition of the strainer (e.g., gaps, deformations) are to be addressed by the system train-specific, non-debris TS actions a and b.

The requirements apply in MODE 1, 2, and 3. In these MODEs, the plant is in normal operating pressure and temperature where generation of design basis quantities of debris can reasonably be postulated. For lower MODEs of operation, there is less energy in the RCS and reduced capability to generate the zones of influence associated with pipe breaks, and the core is at generally lower levels of decay heat generation. Consequently, effects of debris are less likely to cause a condition where ECCS or CSS is inoperable.

Technical Specifications require that all applicable actions must be entered. If concurrent maintenance requirements or a non-debris related degraded or nonconforming condition occurs that would make any system(s) or subsystem(s) inoperable, the non-debris required action for the system(s) or subsystem(s) must be applied. The action from the debris related condition will continue to apply from the time it was initially entered.

Required Action:

The required action to implement compensatory action is based on the very low contribution by LOCA generated debris to the risk of core damage, and is a reasonable response to minimize the potential increase in risk from the debris source. Typical compensatory actions would include:

- Remove the debris or source of debris or take action that would prevent transport of the debris to the emergency sump
- Defer maintenance that would affect availability of the affected systems and strainers
- Defer maintenance that would affect availability of primary defense in depth systems such as RCFCs
- Increase frequency of RCS leak detection monitoring
- Brief operators on LOCA debris management actions

Tech Spec 3.5.2, Action (c) Completion Time:

The 90-day completion time is based on the very low contribution to risk from LOCA generated debris. It provides sufficient time to more thoroughly assess the condition and to take corrective action. Operability can be restored by mitigation of the debris such as by removal or making it non-transportable, or by performing an evaluation that demonstrates that the Licensing Basis is maintained.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

Because the 90-day completion time exceeds the 30-day maximum allowed risk-informed completion time (RICT) for RMTS, use of RMTS for this action is not necessary. However, if a condition unrelated to debris arises where a train of ECCS is declared inoperable while Action (c) is being applied, the non-debris Action (a) or Action (b) must also be applied. In this situation, if the CRMP is applied to Action (a) or Action (b), then the risk contribution from the debris issue must be included and the maximum RICT would still be 30 days. Action (c) for the debris issue still applies from the time it was entered and may not be extended by the RICT (Reference NOC-AE-17003434).

3/4.5.4 NOT USED

3/4.5.5 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA or a steamline break. The limits on RWST minimum volume and boron concentration ensure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core, (2) the reactor will remain subcritical in the cold condition (68°F to 212°F) following a small break LOCA assuming complete mixing of the RWST, RCS, Containment Spray System and ECCS water volumes with all control rods inserted except the most reactive control rod assembly (ARI-1), (3) the reactor will remain subcritical in cold condition following a large break LOCA (break flow area > 3.0 ft^2) assuming complete mixing of the RWST, RCS, Containment Spray System and ECCS water volumes and other sources of water that may eventually reside in the sump post-LOCA with all control rods assumed to be out (ARO), and (4) long term subcriticality following a steamline break assuming ARI-1 and preclude fuel failure.

The maximum allowable value for the RWST boron concentration forms the basis for determining the time (post-LOCA) at which operator action is required to switch over the ECCS to hot leg recirculation in order to avoid precipitation of the soluble boron.

The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

3/4.5.6 RESIDUAL HEAT REMOVAL (RHR) SYSTEM

The OPERABILITY of the RHR system ensures adequate heat removal capabilities for Long-Term Core Cooling in the event of a small-break loss-of -coolant accident (LOCA), an isolatable LOCA, or a secondary break in MODES 1, 2, and 3. The limits on the OPERABILITY of the RHR system ensure that at least one RHR loop is available for cooling including single active failure criteria.

CONTAINMENT VENTILATION SYSTEM (Continued)

fore, the SITE BOUNDARY dose guidelines of 10 CFR 100 would not be exceeded in the event of an accident during containment PURGING operation.

Leakage integrity tests with a maximum allowable leakage rate for containment purge supply and exhaust supply valves will provide early indication of resilient material seal degradation and will allow opportunity for repair before gross leakage failures could develop. Allowed leakage rates will be governed by the Containment Leakage Rate Program.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS – BASES

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the Containment Spray System ensures that containment depressurization and cooling capability will be available in the event of a LOCA or steam line break. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The Containment Spray System and the Containment Cooling System both provide post-accident cooling of the containment atmosphere. However, the Containment Spray System also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable Spray System to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

Operability of the Containment Spray System is confirmed following maintenance activities that can result in obstruction of spray nozzle flow. Confirmation that the spray nozzles are unobstructed may be obtained by a visual inspection, or by an air or smoke flow test.

GSI-191 and GL 2004-02 considerations

The OPERABILITY of the ECCS Subsystems is assured by the capability of the containment emergency sump strainers to limit entry of debris into the sump and recirculating lines. This capability ensures that the flow and net positive suction head requirements of ECCS are satisfied. Assurance that containment debris will not block the sump strainers and render the ECCS Subsystem inoperable on emergency recirculation during design basis accidents is provided by inspection and engineering evaluation. UFSAR Appendix 6A provides a risk-informed approach that addresses the potential of debris blockage concluding that long-term core cooling following a design basis loss of coolant accident is assured with high probability. UFSAR Appendix 6A also provides guidance for assessing the potential impact on Operability due to unexpected material such as loose debris discovered in containment that may contribute to debris loading on the strainers.

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM (continued)

Technical Basis:

The Licensing Basis with regard to effects of debris is that there is a high probability that ECCS and CSS can perform their design basis functions based on successful plant-specific prototypical testing using deterministic NRC-approved assumptions, and that the risk from breaks that could generate debris that is not bounded by the testing is very small and acceptable in accordance with the criteria of RG 1.174.

STP evaluated the risk associated with the effects on long-term cooling due to debris accumulation on Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) sump strainers in recirculation mode, as well as core flow blockage due to in-vessel effects of debris that penetrates the strainers. A full spectrum of postulated LOCAs is analyzed, including double-ended guillotine breaks (DEGBs) for all pipe sizes up to the largest pipe in the reactor coolant system. The changes to CDF and LERF associated with the effects of debris are quantified by applying the LOCA frequencies published in NUREG-1829, and then compared to RG 1.174 acceptance guidelines. The STP analysis shows that the contribution to risk from the breaks that are not deterministically mitigated is within RG 1.174 Region III.

Strainer Operability:

The affected ECCS and CSS are OPERABLE with respect to the effects of debris when the expected effects of the debris on the emergency sump strainers are consistent with the analysis. This operability requirement is based on quantity and characteristics and location of the debris in the RCB being consistent with the debris analysis assumptions. The types of debris considered in the analysis included insulation and latent debris fiber fines, particulate from coatings and latent debris, and chemical precipitates (primarily from aluminum corrosion).

Strainer operability evaluation is fundamentally deterministic and the intent is to not require a risk assessment to make the operability determination. The criterion recognizes that there is margin and conservatism in the debris assumptions used for the deterministic testing and in the debris generation and transport analyses that can be applied to account for previously unidentified debris.

Guidance for evaluating potential debris is provided in 0PSP03-XC-0002 and 0PSP03-XC-0002A.

Applicability:

This required action applies only for the potential effects of debris on emergency sump strainer operability or on in-core debris effects. It does not apply for effects other than those caused by debris for which the testing and analysis apply. Debris effects are conditions caused by transportable debris that could impact the net positive suction head or otherwise degrade pump performance, or cause strainer structural failure by excess accumulation on one or more of the emergency sump strainers. Obstructions or covers on the strainers such as tarps, gaps or other conditions that are a physical degraded or nonconforming condition of the strainer (e.g., gaps, deformations) are to be addressed by the system train-specific, non-debris TS actions a and b.

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM (continued)

The requirements apply in MODE 1, 2, and 3. In these MODEs, the plant is in normal operating pressure and temperature where generation of design basis quantities of debris can reasonably be postulated. For lower MODEs of operation, there is less energy in the RCS and reduced capability to generate the zones of influence associated with pipe breaks, and the core is at generally lower levels of decay heat generation. Consequently, effects of debris are less likely to cause a condition where ECCS or CSS is inoperable.

Technical Specifications require that all applicable actions must be entered. If concurrent maintenance requirements or a non-debris related degraded or nonconforming condition occurs that would make any system(s) or subsystem(s) inoperable, the non-debris required action for the system(s) or subsystem(s) must be applied. The action from the debris related condition will continue to apply from the time it was initially entered.

Required Action:

The required action to implement compensatory action is based on the very low contribution by LOCA generated debris to the risk of core damage, and is a reasonable response to minimize the potential increase in risk from the debris source. Typical compensatory actions would include:

- Remove the debris or source of debris or take action that would prevent transport of the debris to the emergency sump
- Defer maintenance that would affect availability of the affected systems and strainers
- Defer maintenance that would affect availability of primary defense in depth systems such as RCFCs
- Increase frequency of RCS leak detection monitoring
- Brief operators on LOCA debris management actions

Tech Spec 3.6.2.1, Action (c), Completion Time:

The 90-day completion time is based on the very low contribution to risk from LOCA generated debris. It provides sufficient time to more thoroughly assess the condition and to take corrective action. Operability can be restored by mitigation of the debris such as by removal or making it non-transportable, or by performing an evaluation that demonstrates that the Licensing Basis is maintained.

Because the 90-day completion time exceeds the 30-day maximum allowed risk-informed completion time (RICT) for RMTS, use of RMTS for this action is not necessary. However, if a condition unrelated to debris arises where a train of Containment Spray is declared inoperable while Action (c) is being applied, the non-debris Action (a) or Action (b) must also be applied. In this situation, if the CRMP is applied to Action (a) or Action (b), then the risk contribution from the debris issue must be included and the maximum RICT would still be 30 days. Action (c) for the debris issue still applies from the time it was entered and may not be extended by the RICT (Reference NOC-AE-17003434).

3/4.6.2.2 RECIRCULATION FLUID PH CONTROL SYSTEM

The operability of the recirculation fluid pH control system ensures that there is sufficient trisodium phosphate available in containment to guarantee a sump pH of ≥7.0 during the recirculation phase of a postulated LOCA. This pH level is required to reduce the potential for chloride induced stress corrosion of austenitic stainless steel and assure the retention of iodine in the recirculating fluid. The specified amount of TSP will result in a recirculation fluid pH between 7.0 and 9.5.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the Containment Cooling System ensures that: (1) the containment air temperature will be maintained within limits during normal operation, and (2) adequate heat removal capacity is available when operated in conjunction with the Containment Spray Systems during post LOCA conditions.

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.2 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.