Nuclear Operating Company

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

December 18, 2003
NOC-AE-03001650
10CFR50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Unit 2
Docket No. STN 50-499
Supplement 1 to Proposed Emergency Change to Technical Specification 3.8.1.1

Reference: 1. Letter, T. J. Jordan to U.S. Nuclear Regulatory Commission Document Control Desk, "Proposed Emergency Change to Technical Specification 3.8.1.1," dated December 15, 2003 (NOC-AE-03001647).

In the referenced letter, STP Nuclear Operating Company (STPNOC) submitted a proposed emergency amendment to the STP Unit 2 Operating License NPF-80. The proposed changes to the Technical Specifications (TS) revised TS 3.8.1, "AC Sources – Operating," extending the allowed outage time (AOT) for Unit 2 Standby Diesel Generator (SDG) 22 from 14 days to 61 days.

Subsequent to submittal of the referenced letter, STPNOC identified requirements in TS 3.8.1.1.c and TS 3.8.1.1.f that are not compatible with the proposed extension to the AOT for SDG-22 in TS 3.8.1.1.b. STPNOC would not be able to comply with the action required in TS 3.8.1.1.c or TS 3.8.1.1.f to restore three SDGs to operable status within 14 days. Therefore, in addition to the proposed change to TS 3.8.1.1.b, STPNOC proposes to amend TS 3.8.1.1.c and TS 3.8.1.1.f.

Additionally, this letter responds to a request for additional information regarding the referenced license amendment request and adds clarification on balance of plant maintenance and the deterministic assessment provided in the referenced letter.

If there are any questions regarding this response, please contact Mr. Scott Head at (361) 972-7136.

A001

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 18, 2003.
date

T. J. Jordan
Vice President
Engineering & Technical Services

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Attachments:
1. Response to Request for Additional Information
2. Balance of Plant Maintenance Clarification
3. Clarification on Deterministic Assessment
4. Description of Proposed Amendment to TS 3.8.1.1.c and TS 3.8.1.1.f
5. Annotated Technical Specification Pages
6. Revised Technical Specification Pages
7. Commitments

cc:

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ATTACHMENT 1

Response to Request for Additional Information

1. Please identify the root cause of the December 9, 2003 failure of SDG 22.

Response:

The root cause of the diesel engine failure is microcracks created on the position 9 master connecting rod during manufacturing that propagated due to high cycle fatigue until the master connecting rod failed.

A typical connecting rod in the South Texas Project (STP) standby diesel generator (SDG) engine is shown in Figure 1. The articulated connecting rod is on the left and the master connecting rod is on the right. Each piston position in the diesel engine consists of a left (L) bank piston utilizing the articulated connecting rod and a right (R) bank piston utilizing the master connecting rod.

Figure 2 is a detailed view of the connecting rod bearings. Section A-A shows the detail of the oil ports drilled in the body of the master connecting rod that allow lube oil to flow to the articulated rod pin. Section A-A is important to understanding the difference between the cause of the 1989 STP SDG failure and the recent SDG 22 failure. The SDG failed in 1989 because the vertical hole in the center of Section A-A was overdrilled past the horizontal hole and continued almost to the upper surface. No similar manufacturing defect was discovered in SDG 22 position 9.

The 1989 and 2003 failures occurred in the same area below the articulated rod pin and both had the same propagation mechanism of high cycle fatigue (HCF), but the 2003 failure is not a repeat failure because there is a different initiation site and a different initiation mechanism.

The recent crack initiated in a region of microcracks at the surface of the master rod crankshaft bore. The crack initiation area was at the bottom of a small indentation that was made after the master rod failure (i.e., the crack initiation area was struck during the failure). The indentation was a smooth, high-energy impact with directional lines that partially overlapped the fracture surface.

Based on Scanning Electron Microscope inspection of the HCF crack initiation site, there is no evidence of foreign material entrapped between the bearing shell and the connecting rod crankshaft bearing bore. There is no evidence of fretting fatigue, large inclusions, or foreign material at the crack initiation site. The crack actually initiated from two origins in very close proximity and very similar in initiation time (simultaneous), because the two crack fronts grew together over a short distance.

Evaluation of the surface features in the bottom of the indentation and beside the indentation at the fracture surface determined that the indentation was not the stress riser that caused the initiation of the crack. The surface features in both areas are comparable and exhibit surface microcracking parallel to the failure fracture surface. Energy Dispersive Spectroscopy confirmed the microcracking is in the master rod crankshaft bore surface and does not represent cracking of a deposited or transferred material.

The microcracks represent tears in the material that would have required high load to produce. The connecting rod area between the crankshaft bore and the articulated rod bushing bore (ligament) undergoes alternating stresses, which allowed the microcracks to slowly propagate through the master connecting rod until critical crack size.

The surface features and microcracking are consistent with damage produced during manufacture (e.g., tool chatter) followed by normal surface honing to achieve the required finish. The high load required to produce the microcracks would only be generated during machining operations. Machine problems (dull cutting tool, etc.) or a small defect in the master connecting rod material could cause the cutting edge to chatter.

The crack initiated on the master connecting rod in the ligament area. The crack propagated through the section thickness (approximately 1") and then propagated across the width of the bore. One side of the fracture essentially extended 100% across the width of the fracture face with only a small corner section showing overload. The other side of the fracture extended approximately 3.5" angled toward the articulated rod bushing surface, then failed due to overload. The width of the fatigue crack is 7" of a total of 9". It is estimated that 65% of the fracture surface is HCF, 30% is overload, and 5% is impact damage after the failure. Refer to Figure 3.

2. Please provide an assessment of the potential for common mode failure of the other SDGs at both STP units.

Response:

Probability of Common Mode Failure Based on Operating Hours

The metallurgical analysis of the SDG 22 failed connecting rod clearly demonstrates that the failure mechanism was HCF. Metal fatigue generally progresses in three different stages, crack initiation, crack propagation, and section breakdown. In each stage there is some kind of repetitive, cyclic load below the normal strength limits of the material. In the case of the articulated rod connection to the main connecting rod, the cyclic loads that generate surface tensile stresses at the initiation site occur due to the inertial forces of the master piston at the top of the exhaust stroke, or once for every two rotations of the crankshaft. A crack is initiated at the level of very small faults in the metal. This can be an impurity, surface roughness or irregularity, scratches, etc. All metals exhibit these characteristics to some extent. In some cases, more pronounced macroscopic defects such as grooves, sharp shoulders, casting defects, larger impurities can exist which dramatically shorten this stage of crack development. Macroscopic defects were not evident in the connecting rod from SDG 22 position 9.

During the propagation phase the crack will grow on each cycle of the cyclic load. Initially, the crack will grow along lines of maximal shear and then it will grow along the lines of maximal tensile stress. At this stage, the 'microcrack' has become a 'macrocrack', because the growth depends only on properties of the bulk material and not on the microscopic local properties. In this phase, finite element stress analysis and fracture mechanics can be used to predict the number of cycles necessary for the crack to grow to critical size, i.e., the breakdown phase. The growth of the crack continues until the cross section has become unable to cope with the load and the breakdown phase is entered, usually with a rapid failure of the material section.

Empirical fatigue tests are used to generate stress vs. cycles (S-n) plots to determine the stress levels below which no fatigue failures will occur. The endurance limit represents the repetitive stress level below which no fatigue failures will occur based on empirical test data. Typically, if a test specimen has been tested for 10 million cycles or more, it has shown that it is operating at a stress below the endurance stress. Although 10 million stress cycles is well accepted as the fatigue limit, the phenomenon is sufficiently uncertain that initiation could occur at up to twice the time, or 20 million cycles.

As stated above, the 1989 failure resulted from an overdrilled oil passage, which left a sharp stress riser in the component. The 1989 failure essentially bypassed the initiation phase and the crack propagated to failure in about 600 operating hours (10.8 million cycles).

The diesel engine speed is 600 RPM and only the exhaust stroke of the master connecting rod creates the tensile stress of concern, which results in 300 stress cycles per minute or 18,000 cycles per hour. Using a conservative factor of two for margin for error, the initiation phase could be as long as 20 million cycles or 1111 operating hours. As indicated in the 1989 fracture mechanics analysis, the propagation phase should be no more than 25 million cycles or 1338 operating hours. Therefore, an engine operating history of about 2500 hours (maximum theoretical initiation time plus maximum theoretical propagation time) would virtually assure that no fatigue failure would occur in this section of the connecting rod.

The failure of the connecting rod could not reasonably be the result of a pre-existing defect (macrocrack) because fracture mechanics analysis indicates that a crack should propagate to failure in no more than 25 million cycles (1338 hours) and the operating time on SDG 22 is about 2100 hours. This is consistent with the metallurgical analysis.

Confidence that another failure is imminent can be reduced to near zero by an inspection of the other diesel engine connecting rods in the area of concern. If any connecting rod originally had a small flaw in the master rod ligament between the crankshaft bore and articulated rod pin bore and if this rod was installed in an engine with over 1000 hours of operation, then that rod would have an HCF crack of sufficient size to be detectable by NDE methods. All connecting rods in the STP diesel engines have seen more than 1600 hours of operation except for the connecting rod replaced in SDG 22 in 1989, which has approximately 1400 hours of operation. Inspections will be conducted on all master connecting rods at STP using NDE techniques (if assembled) or visual/NDE techniques (if disassembled).

Potential for Common Mode Failure Based on Population of Cooper Bessemer Diesel Engines

It is considered unlikely that another connecting rod failure would occur due to the same cause as the recent failure of SDG 22. There are 55 Cooper Bessemer KSV engines in service around the world today. Twelve that are in commercial service have each accumulated more than ten thousand operating hours on machined master connecting rods similar to the connecting rod in SDG 22. The total population of connecting rods is about 550, including spares for each engine.

The probability of the same cause of failure that recently occurred on SDG 22 occurring in a second engine in the entire fleet of Cooper Bessemer KSV-20s is very low. The probability of producing a second master connecting rod having a flaw, of having a flaw that is large enough to propagate, and of the flaw being located in the critical ligament region where it could progress to failure, is estimated to be less than one in the total population of manufactured master connecting rods. Given the total population of connecting rods, the probability is very low that another similar rod failure will occur at STP.

If another rod at STP had been created with the same stress riser in the same critical area, then a crack would have developed by now that could be detectable by NDE testing.

3. Please describe the NDE processes that will be performed on the master connecting rods of the other SDGs at both STP units.

Response:

STP will utilize a Harfang® Microtechnologies X32 phased array system to interrogate the volume of metal on the main connecting rods in the area where the failure occurred. The phased array technology is an extension of conventional ultrasound. Instead of having only one element per probe, however, an array of multiple small piezoelectric elements is used. This technique is capable of detecting cracks perpendicular to the bearing surface oil groove. The examination area is a small cross section region between the crankshaft bearing shell bore and the articulated rod pin bearing bore surface out to one inch past the drilled oil passage. Because of the geometry of the section being examined, multiple reflections from the drilled oil passage will be present. Because the reflected patterns are reproducible, this technique utilizes pattern recognition from the geometric ultrasonic responses. A phased array pulsed echo technique is used where refracted longitudinal waves are propagated at angles ranging from 0.2 to 40 degrees. The examinations are conducted from the accessible outer surface of the main rod on the articulated rod side. The engine must be removed from service and bolted covers on the engine must be removed to provide access, however, engine component disassembly is not required. An Electric Discharge Machining notch has been machined in a main connecting rod from SDG 22 to simulate a crack in the region of concern to calibrate the equipment.

STPNOC has provided the NDE procedures under separate cover.

STPNOC plans to perform phased array ultrasonic examination of all master connecting rods in the three Unit 1 SDGs and in SDG 22 by December 22, 2003, contingent upon their availability for examination.

STPNOC plans to perform phased array ultrasonic examination of all master connecting rods in SDG 21 and SDG 23 following the SDG 22 return to service.

NDE will be performed on any master connecting rods before they are installed in SDG 22.

STPNOC will perform a similar phased array ultrasonic examination at appropriate intervals (based on accumulated run time between examinations) during planned diesel outages until the diesel engines accumulate sufficient run time that these inspections are no longer necessary. These inspections will be conducted at the 5-year overhaul of each engine (i.e., approximately every 500 hours of operation) and on SDG 22 after the engine accumulates 500 hours run time after the rebuild.

4. Please justify the schedule duration for the SDG 22 EAOT.

Response:

The EAOT schedule was prepared based on the current known scope of repairs, availability of spare parts, and the expected difficulty of disassembly and reassembly. Industry experts and the STP diesel vendor's experts consulted in the development of the schedule. STPNOC believes that the current schedule allows time to safely implement repairs in a quality manner. There is also adequate time allowed for post-maintenance testing and a small scope growth contingency.

STPNOC has provided the Level 2 and Level 3 schedules for the EAOT under separate cover. These schedules evolve on a daily basis as work continues.

STP is confident in the schedule, but if at any time STP discovers, or becomes aware that we may not be able to complete repairs and return SDG-22 to operability within the 61-day AOT, then STP will take the following actions:

1. STP will inform the NRC in a timely manner.
2. STP will evaluate the condition, its impact on the repair schedule, and the potential to pursue a request for an extension beyond the approved 61-day AOT. If considered appropriate, STP will apply for relief from this license condition.
3. If our evaluation determines that it is not appropriate to pursue a supplemental license amendment request, or if the NRC Staff indicates that it will not approve such a request, STP will implement the shutdown requirements of TS 3.8.1.1.

It should be noted that, at any time in which STP Units 1 or 2 is in a TS shutdown LCO, it is always the practice and expectation that STP will initiate shutdown of the affected unit as soon as it becomes evident that the associated TS equipment cannot be returned to operable status within the allowed outage time and relief cannot be justified and obtained, rather than delaying shutdown until the end of the AOT period.

5. Please provide an assessment from a PRA perspective of the potential impact of severe weather during the 61-day EAOT.

Response:

The STP site has not experienced a loss of offsite power due to icing conditions since the plant began operation in March 1987. Several instances of extreme cold or ice have occurred at the plant site that did not affect power distribution to the facility. Severe ice storms that potentially affect plant operation have been screened from the external events analysis of the STP PRA based on the low likelihood of occurrence.

Section 8.2.1.1 of the STP UFSAR states:

> The structures for these circuits [transmission lines], as well as the 345 kV switchyard, are built to withstand hurricane force winds. In this area, the ice-loading condition on transmission lines is not considered significant since it is less than the hurricane wind loading on transmission or substation structures.

The likelihood of a loss of offsite power due to icing is not zero, but the likelihood is very remote. Given a loss of offsite power, the conditional core damage probability with SDG 22 out of service is 7.7E-04 for loss of the 345 kV grid and 1.7E-04 for the loss of the 345 kV and 138 kV grids. If we assume an ice storm affecting STP has a ten percent likelihood of occurrence and one in ten ice storms affect offsite power distribution, the frequency of a severe ice storm with loss of offsite power is one in one hundred. The likelihood of core damage with SDG 22 out of service and a severe ice storm is 7.7E-06 for loss of the 345 kV grid and 1.7E-06 for the loss of 345 kV and 138 kV lines. Based on STP operating experience and the plant design, the one in one hundred likelihood of severe ice storms leading to a loss of offsite power is extremely conservative.

6. The application lists compensatory measures that are presently in place and will remain in place until completion of the repair to SDG 22 and its return to operation. Please describe what action will be taken if severe weather or grid stability concerns arise during the repair period.

Response:

In the event of severe weather, Operations will implement procedure, 0POP01-ZO-0004, "Extreme Cold Weather Guidelines," which provides the guidance to safely operate the plant during cold weather conditions. In the event of grid instability, Operations will implement off normal procedure 0POP04-AE-0005, "Offsite Power System Degraded Voltage," which directs operation of the unit and required actions based upon degraded voltage in the switchyard. This includes notification of the Transmission/Distribution Service Provider (TDSP). Emergency operating procedures provide guidance on a complete loss of offsite power.

In addition, STP will revise station procedures for responding to inclement weather to include guidance for coping with icing conditions that are affecting the offsite distribution system to adopt a similar strategy to the strategy currently in place to respond to hurricane force winds onsite. Specifically, in the event of a determination by the Duty Plant Manager after consultation with the TDSP that icing conditions in the area of STP may result in a loss of all power to the switchyard, STP will commence a shutdown of Unit 2 to Mode 3. The procedure will also require that one Standby Diesel be started and loaded to its ESF bus and that the ESF bus be subsequently removed from offsite power. These procedure revisions will be completed by December 23, 2003.

STP is also developing procedural guidance to supply electrical power to an ESF bus in a unit that has lost all electrical power to its ESF busses from a functioning Emergency Diesel in the opposite unit. This procedure will only be implemented when the failure of emergency power sources in a unit has occurred such that the remaining emergency power is judged to be inadequate for mitigation of the event and sufficient power is available in the opposite unit to meet its electrical power requirements. This procedure will be approved by December 23, 2003.

7. Please describe what is the Alternate AC source for station blackout that replaces the third SDG now required as the second onsite power supply.

Response:

Another Alternate AC (AAC) source is not needed to replace the affected diesel generator because the original licensed position for station blackout at STP was a four-hour coping period. The coping period and its basis are described in section 8.3.4 of the UFSAR. There has not been any modification to either unit that changes, affects, or shortens the four-hour coping period since the original submittal. Since the original submittal for station blackout, STP submitted the use of any of the three standby diesel generators as an AAC source. The use of an AAC source shortens the coping period to ten minutes; however, as stated above, both units at STP still have a four-hour coping capability.

8. Please describe the formal communication protocols and agreements that are presently in place between the STP and the local transmission and distribution independent system operator to (1) reduce the probability of loss of offsite power to the STP and (2) maintain adequate offsite power system voltage at STP assuming a trip of either unit at STP.

Response:

The State of Texas deregulated the electric power industry on January 1, 2002. As part of preparing for deregulation, STP entered into a formal agreement with CenterPoint Energy, who is the TDSP. Also, STP provided input to the Electric Reliability Council of Texas (ERCOT) when their Protocols, Guidelines and Procedures were written. Both the TDSP and ERCOT know and respond to the requirements of the plant for voltage and power availability. STP has open communication in both directions with the power scheduling entity and the TDSP via a ring down phone line.

The South Texas Project has eight 345 kV lines entering a common switchyard on four separate rights-of-way. The far end of the transmission lines tie into a very large area of Texas within the ERCOT system. ERCOT is also the Independent System Operator (ISO). There is also one 138 kV transmission line that feeds an emergency circuit to any of the safety-related 4.16 kV busses. This arrangement provides STP with a very robust source of power at any time. Also, as part of our agreements with the TDSP, switchyard work will be put on hold unless it is absolutely necessary.

Should either (or both) units trip at STP, the voltage at the switchyard will remain at or above the minimum voltage required to keep the 4.16 kV busses above their degraded grid undervoltage setpoints. An analysis has been performed by the TDSP to verify this condition. Also, the TDSP runs studies, as well as ERCOT, to ensure that postulated single failures on the transmission system do not drop voltages at STP below the required value.

ERCOT operates on a frequency-controlled system rather than a voltage-controlled system. Therefore, the frequency starts to decline if the system has large losses in generation. Preventative measures installed into the system by ERCOT are predetermined underfrequency settings that automatically drop load. ERCOT has three predetermined underfrequency settings starting at 59.3 Hz. The three settings will drop load on the ERCOT system by a total of 25%.

9. Please describe what additional compensatory actions STP will perform respond to challenges to the offsite grid during operation in the proposed AOT for SDG 22.

Response:

0POP01-ZO-0006, "Extended Allowed Outage Time," provides guidance for the accomplishment, control, and documentation of activities performed in preparation for and operations during an EAOT for auxiliary feedwater, SDG, essential cooling water, or essential chilled water. It establishes compensatory measures that are consistent with the Configuration Risk Management Program to offset the risk impact of entering an EAOT. These compensatory actions were included in the initial request for a license amendment.

Additionally, Operations is developing a Condition Report Operation Evaluation (CROE 03-18103-11) to address administration of the 61-day AOT. These guidelines include expectations for:

- Operations supervisory reviews of maintenance and its affect on risk
- Operations scheduled reviews of maintenance during the 61-day AOT
- Process for addressing emergent issues associated with the 61-day AOT

- Communication plan

Refer also to item 6 above.

10. The application states that the repair duration is expected to 61 days if a replacement of the crankshaft is not required. Please describe what controls are in place to monitor the repair progress and communication of that progress to the staff.

Response:

A project management organization has been developed to manage the repair efforts. The organization is divided into several defined functional areas, which include project managers, engineers, and various support functions. The organization is staffed 24 hours a day, seven days a week.

Field progress is measured against a project critical path schedule. Activity status is conveyed in various meetings conducted throughout the day and is verified through field observations and team feedback loops. The schedule is updated and analyzed on a periodic basis.

STP will provide updates to the resident inspectors, generally daily, or as requested and agreed upon. Additionally, STP will brief Region IV management during routine weekly communications or as requested. STP will notify Region IV management in the event of significant changes in the status of diesel repair activities or schedule.

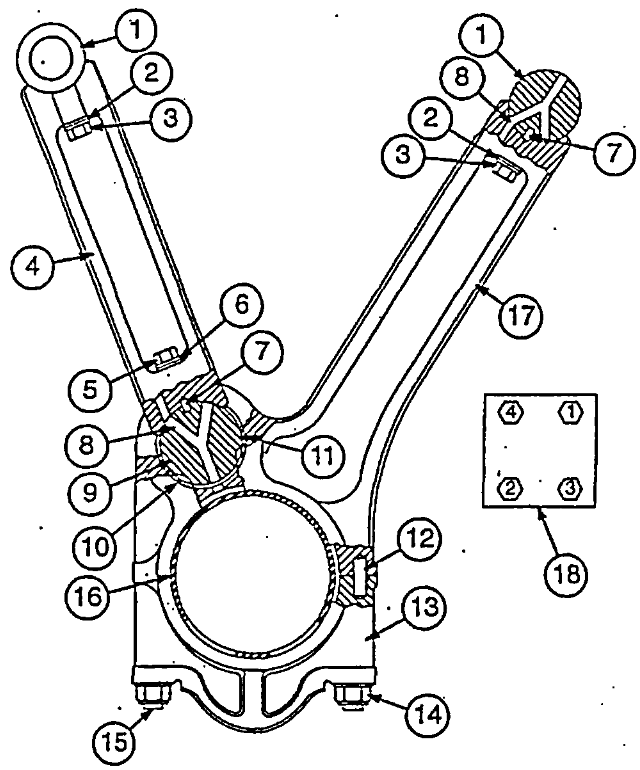
11. The application states that severe weather is not a concern because the repair is being performed outside of the tornado and hurricane seasons. Please confirm that any other severe weather (such as icing) is not a concern.

Response:

The potential does exist for ice storms to occur at STP. Refer to items 5 and 6 above.

Figure 1

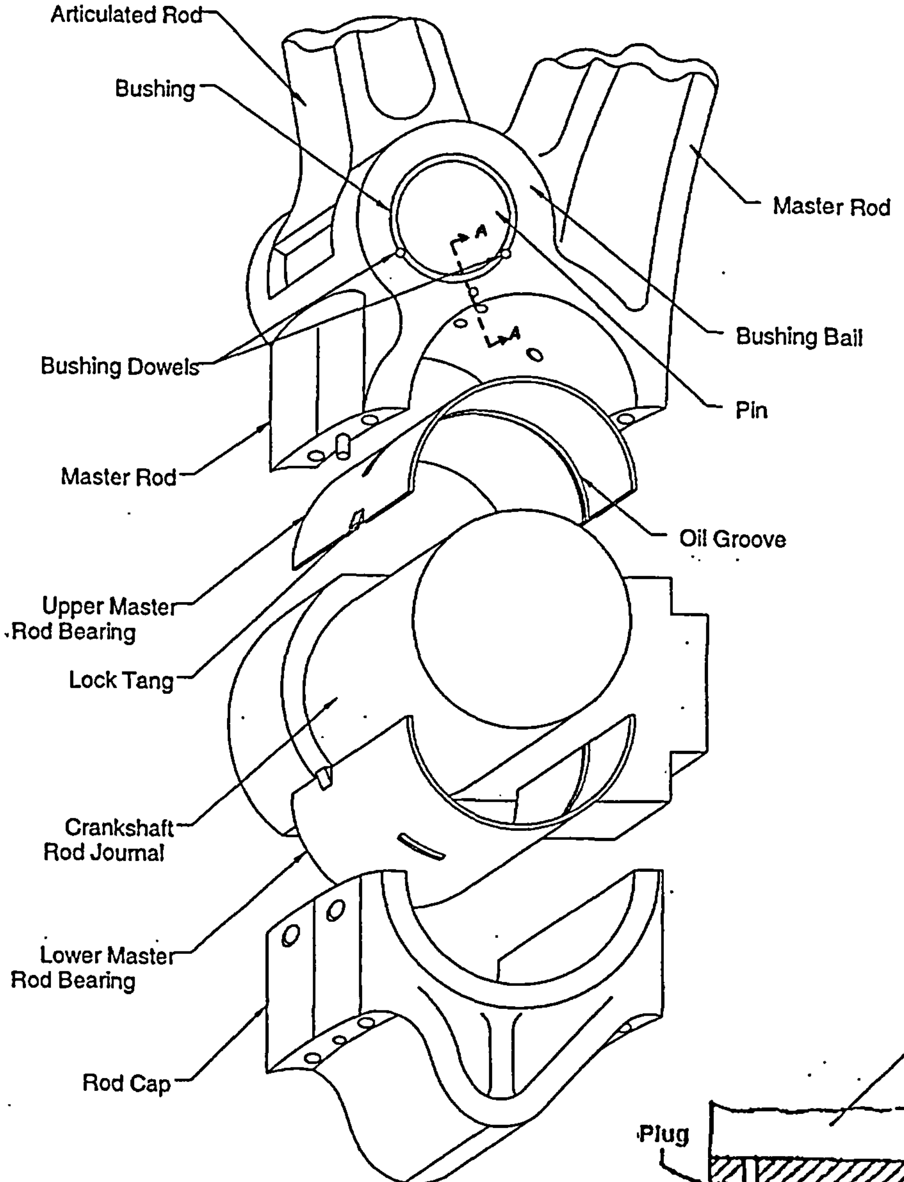
STP Diesel Engine Connecting Rod

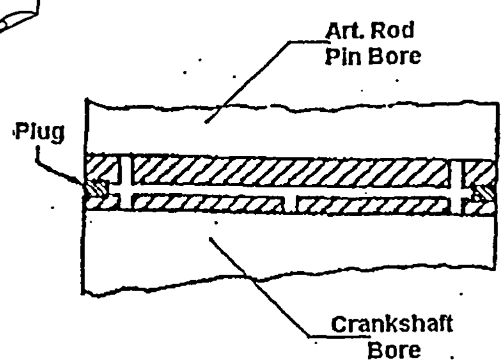


1. Piston Pin
2. Washer
3. Piston Pin Bolt
4. Articulated Rod
5. Articulated Rod Pin Bolt
6. Washer
7. Dowel
8. Oil Passage
9. Articulated Rod Pin
10. Bushing Dowel Pin
11. Bushing
12. Dowel
13. Connecting Rod Cap
14. Locknut
15. Stud
16. Bearing Shell
17. Master Rod
18. Nut Tightening Sequence

Figure 2

STP Diesel Engine Connecting Rod Bearings

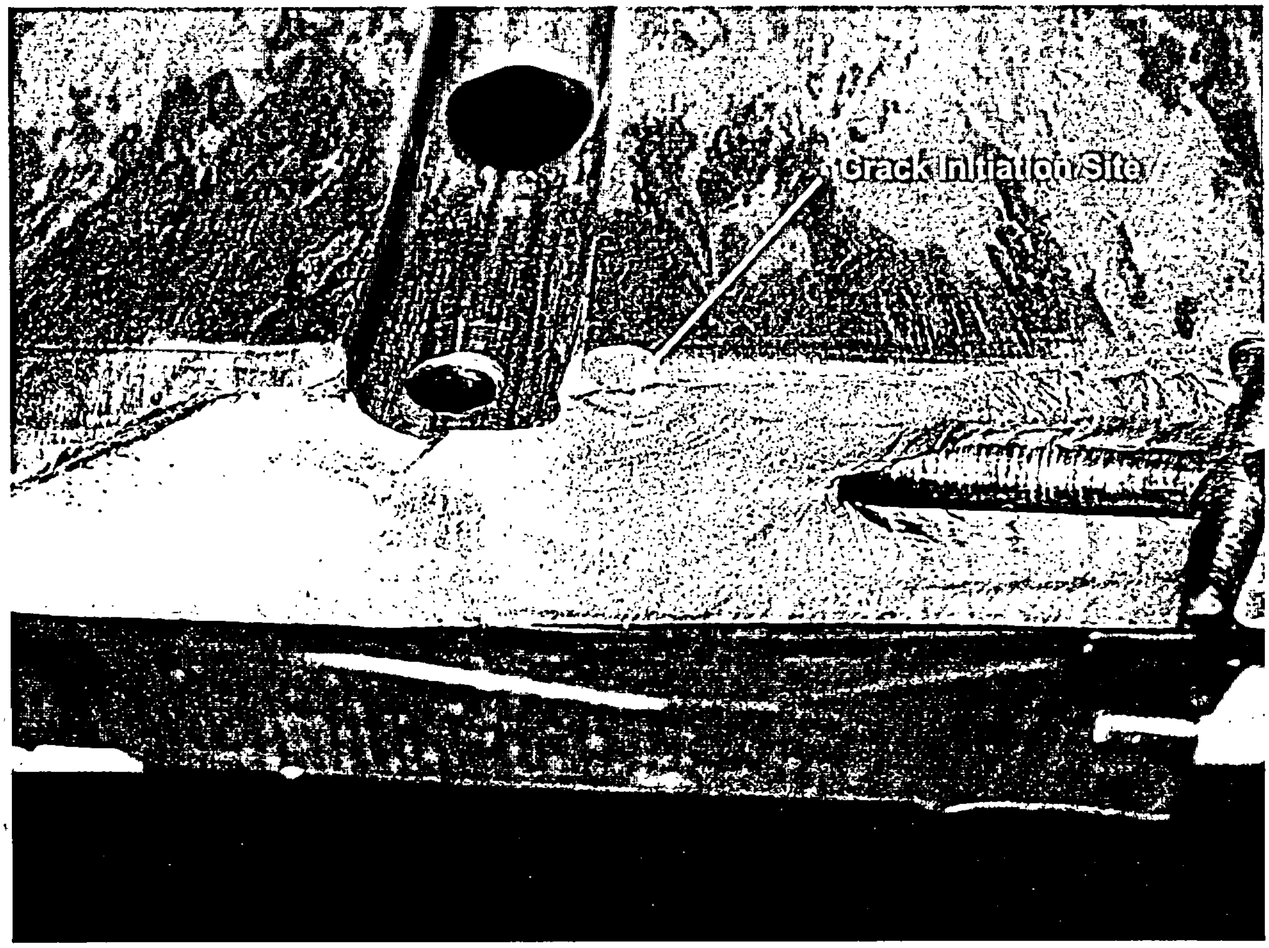




Section A-A

Figure 3

Crack Initiation Site



ATTACHMENT 2

Balance of Plant Maintenance Clarification

In the original application, STPNOC stated that planned maintenance of components that could affect the risk calculated for the 47-day extension would be suspended for the time that SDG-22 is inoperable beyond its normal 14-day AOT. It was not STPNOC's intent to exclude all maintenance on the balance of plant (BOP). STPNOC believes that a limited amount of planned maintenance on secondary system components is appropriate to maintain reliability of the unit and is acceptable. Consequently, STPNOC has clarified this compensatory action with regard to how BOP maintenance will be managed.

Although BOP initiating events are modeled in the Probabilistic Risk Assessment (PRA) (e.g., loss of feedwater), changes in BOP trip risk due to secondary equipment unavailability is not included in the risk calculated for the 47-day extension. However, the Configuration Risk Management Program (CRMP) risk monitor can quantify the change in BOP trip risk and the impact to core damage frequency (CDF). The impact to CDF of planned maintenance of BOP secondary equipment is typically not significant. STPNOC monitors and controls changes in BOP trip risk due to planned maintenance activities in accordance with the CRMP. In addition, during the extended SDG 22 AOT, approval of the Operations Division Manager will be required prior to performing planned maintenance that will increase BOP trip risk.

As described in the original application, planned maintenance on BOP equipment specifically listed in the compensatory actions will not be performed (e.g., TSC diesel, switchyard, etc.).

ATTACHMENT 3

Clarification on Deterministic Assessment

Clarification to Deterministic Assessment

STPNOC has corrected the information provided in Table 1 of the original application regarding the ability to maintain positive pressure in the Control Room in the event of an accident with single failure while SDG-22 is inoperable.

As discussed in the NRC Safety Evaluation for Amendments 85/72, dated October 31, 1996, the entire control room ventilation envelope may not be maintained at a positive pressure during single train operation. Testing of the control room ventilation system with only one train running in October 1994 resulted in a negative relative pressure (0.04 inch) in one equipment room within the control room envelope.

STPNOC has reviewed the other NRC conclusions in the safety evaluation and believes they remain valid.

Table 1: Deterministic Capability with One Inoperable SDG and Assuming Single Failure [1]

System	Function Affected	Alternative Action	Comments
Safety Injection (LHSI and HHSI)	Cannot mitigate LBLOCA if the SI train is injecting into the broken RCS loop	None (minimal cooling from using hot leg recirculation)	One train in maintenance outage One train fails One train injects into the broken loop
Safety Injection (HHSI)	Steam line break mitigation capability reduced	None required	DNB not expected to occur
Safety Injection (LHSI and HHSI)	Cannot mitigate SBLOCA without operator action if the SI train is injecting into the broken RCS loop	Operator action per EOPs to depressurize	One train in maintenance. One train fails. One train of HHSI not enough to match break flow Operator action is expected to be effective
Residual Heat Removal	Cannot provide long term cooling if only a single ESF bus is energized or if RHR is injecting into broken loop	Continue to inject using LHSI until RHR is restored.	RHR is required approximately 14 hours after event. Recovery of power to ESF bus is expected within 8 hours
Containment Spray	Iodine removal during a LBLOCA or SBLOCA	Monitor TSC doses and relocate to lower dose area	
Control Room Envelope HVAC	Cannot maintain 1/8" positive pressure	None	Tests done during single-train operation have shown minor in-leakage may occur in equipment room inside the control room envelope. [2]
Fuel Handling Building HVAC	Cannot provide filter path for recirculation phase leakage if C train is only operable train	Provide alternate power supply from operable diesel	Procedure in place for establishing cross-connect.
Component Cooling Water	CCW flow to RCFC's and RHR Heat Exchanger less than design	Manually isolate non-safety header to restore design flow.	If train C is the operable train, CCW flow approximates design flow. Effect of reduced CCW flow is slight even without manual action.

(1) These conditions require an initiating event (i.e., Large Break LOCA) with a loss of offsite power and failure of a standby diesel generator given a diesel generator is unavailable for its extended AOT.
(2) NRC SE for Amendments 85/72 dated October 31, 1996 acknowledged the in-leakage.

ATTACHMENT 4

Description of Proposed Amendment to TS 3.8.1.1.c and TS 3.8.1.1.f

Subsequent to submittal of the changes proposed in the application dated December 15, 2003, STPNOC identified requirements in TS 3.8.1.1.c and TS 3.8.1.1.f that impose the requirement to restore three SDGs to operable statues within 14 days from the time of initial entry into the action statement. These requirements are not compatible with the proposed extension to the allowed outage time (AOT) for SDG-22 in TS 3.8.1.1.b in that STPNOC would not be able to comply with the action required in TS 3.8.1.1.c or TS 3.8.1.1.f to restore three SDGs to operable status within 14 days. Consequently, in addition to the proposed change to TS 3.8.1.1.b, STPNOC proposes to add the same Note 12 to TS 3.8.1.1.c and TS 3.8.1.1.f that is proposed for TS 3.8.1.1.b as shown below.

c. With one offsite circuit of the above-required A.C. electrical power sources and one standby diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and if the standby diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE standby diesel generator(s) by performing Surveillance Requirement 4.8.1.1.2a.2) within 8 hours, unless it can be demonstrated there is no common mode failure for the remaining diesel generators; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits to OPERABLE status within 72 hours and three standby diesel generators to OPERABLE status within 14 days from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.(12)

f. With two or three of the above required standby diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing the requirements of Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; restore at least one standby diesel generator to OPERABLE status within 2 hours and at least two standby diesel generators to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least three standby diesel generators to OPERABLE status within 14 days from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.(12)

Note 12 to appear on page 3/4 8-7 (Repeated here for completeness):

(12) For the Unit 2 Train B standby diesel generator (SDG-22) failure of December 9, 2003, restore the inoperable standby diesel generator to OPERABLE status within 61 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

As discussed in the original submittal, STPNOC will suspend planned maintenance of components that could affect the risk calculated for the 47-day extension of the SDG 22 AOT. That submittal discusses the application of TS 3.8.1.1.d to address corrective maintenance and performance of surveillance requirements (SR) for Train A and Train C components required by the TS. STPNOC would similarly apply TS 3.8.1.1.c for corrective maintenance for emergent conditions where a required off-site power source is lost while SDG 22 is not operable and TS 3.8.1.1.f where more than one SDG is inoperable. As discussed in the original submittal, STPNOC may perform SRs for SDG 21 or SDG 23 where the SDG is functional, but not operable, for part of the SR. This condition would require entry into TS 3.8.1.1.f.

This proposed changes to TS 3.8.1.1.c and TS 3.8.1.1.f are made for consistency with TS 3.8.1.1.b. The time limits on the shutdown action are worded slightly differently in the note and the action statements in that the action statements specify times to achieve hot standby and cold shutdown, and the note (originally excerpted from TS 3.8.1.1.b) specifies times to achieve hot shutdown and cold shutdown. However, the total time to be in cold shutdown is 36 hours in all cases. The intent and assumption for both action statements and the note is a normal plant shutdown to cold shutdown and the difference in wording is not significant.

The technical justification, risk analysis, and No Significant Hazards Consideration provided in the original application of December 15, 2003 are not affected by this consistency change.

The STPNOC Plant Operations Review Committee has reviewed and concurred with the proposed change to the Technical Specifications.

In accordance with 10 CFR 50.91(b), STPNOC is notifying the State of Texas of this request for license amendment by providing a copy of this letter and its attachments.

ATTACHMENT 5

Annotated Technical Specification Pages

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE standby diesel generators by performing Surveillance Requirement 4.8.1.1.2a.2) within 8 hours, unless it can be demonstrated there is no common mode failure for the remaining diesel generator(s); restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits to OPERABLE status within 72 hours and three standby diesel generators to OPERABLE status within 14 days from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.(12)

d. With one standby diesel generator inoperable in addition to ACTION b. or c. above, verify that:

1. All required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and

2. When in MODE 1, 2, or 3, the steam-driven auxiliary feedwater pump is OPERABLE.

If these conditions are not satisfied within 24 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

f. With two or three of the above required standby diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing the requirements of Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; restore at least one standby diesel generator to OPERABLE status within 2 hours and at least two standby diesel generators to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least three standby diesel generators to OPERABLE status within 14 days from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.(12)

ATTACHMENT 6

Revised Technical Specification Pages

ACTION (Continued)

maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE standby diesel generators by performing Surveillance Requirement 4.8.1.1.2a.2) within 8 hours, unless it can be demonstrated there is no common mode failure for the remaining diesel generator(s); restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits to OPERABLE status within 72 hours and three standby diesel generators to OPERABLE status within 14 days from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.[12]

d. With one standby diesel generator inoperable in addition to ACTION b. or c. above, verify that:

   1. All required systems, subsystems, trains, components, and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and

   2. When in MODE 1, 2, or 3, the steam-driven auxiliary feedwater pump is OPERABLE.

   If these conditions are not satisfied within 24 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With two of the above required offsite A.C. circuits inoperable, restore at least one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite source restored, restore at least two offsite circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

f. With two or three of the above required standby diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing the requirements of Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; restore at least one standby diesel generator to OPERABLE status within 2 hours and at least two standby diesel generators to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least three standby diesel generators to OPERABLE status within 14 days from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.[12]

ATTACHMENT 7

Commitments

COMMITMENTS

The following is a summary of the commitments made in this letter. These commitments have been entered into the STP Corrective Action Program (CAP) for tracking. The CAP meets the requirements of NEI 99-04, Rev. 0, "Guidelines for Managing NRC Commitment Changes." There are no commitments other than the following in this letter:

1. STPNOC plans to perform phased array ultrasonic examination of all master connecting rods in the three Unit 1 SDGs and in SDG 22 by December 22, 2003, contingent upon their availability for examination.

2. STPNOC plans to perform phased array ultrasonic examination of all master connecting rods in SDG 21 and SDG 23 following the SDG 22 return to service.

3. NDE will be performed on any master connecting rods before they are installed in SDG 22.

4. STPNOC will perform a similar phased array ultrasonic examination at appropriate intervals (based on accumulated run time between examinations) during planned diesel outages until the diesel engines accumulate sufficient run time that these inspections are no longer necessary. These inspections will be conducted at the 5-year overhaul of each engine (i.e., approximately every 500 hours of operation) and on SDG 22 after the engine accumulates 500 hours run time after the rebuild.

5. If at any time STP discovers, or becomes aware that we may not be able to complete repairs and return SDG-22 to operability within the 61-day AOT, then STP will take the following actions:

   a) STP will inform the NRC in a timely manner.

   b) STP will evaluate the condition, its impact on the repair schedule, and the potential to pursue a request for an extension beyond the approved 61-day AOT. If considered appropriate, STP will apply for relief from this license condition.

   c) If our evaluation determines that it is not appropriate to pursue a supplemental license amendment request, or if the NRC Staff indicates that it will not approve such a request, STP will implement the shutdown requirements of TS 3.8.1.1.

6. STP will revise station procedures for responding to inclement weather to include guidance for coping with icing conditions that are affecting the offsite distribution system to adopt a similar strategy to the strategy currently in place to respond to hurricane force winds onsite. Specifically, in the event of a determination by the Duty Plant Manager after consultation with the TDSP that icing conditions in the area of STP may result in a loss of all power to the switchyard, STP will commence a shutdown of Unit 2 to Mode 3. The procedure will also require that one Standby Diesel be started and loaded to its ESF bus and that the ESF bus be subsequently removed from offsite power. These procedure revisions will be completed by December 23, 2003.

7. STP is developing procedural guidance to supply electrical power to an ESF bus in a unit that has lost all electrical power to its ESF busses from a functioning Emergency Diesel in the opposite unit. This procedure will only be implemented when the failure of emergency power sources in a unit has occurred such that the remaining emergency power is judged to be inadequate for mitigation of the event and sufficient power is available in the opposite unit to meet its electrical power requirements. This procedure will be approved by December 23, 2003.

The commitment from the initial license amendment request (NOC-AE-03001647) is included for completeness:

1. STP will monitor changes in planned risk levels using the CRMP. During the extended AOT, the calculated average CDF levels will be updated in the event unplanned maintenance is required on equipment within the scope of the CRMP. Risk levels will be monitored throughout the SDG-22 outage and STP will comply with the risk threshold actions required by the CRMP. In addition, STPNOC will keep the NRC Resident Inspector apprised of deviations from the expected risk profile for the duration of the SDG-22 repair.