

December 31, 2002

Mr. William T. Cottle
President and Chief Executive Officer
STP Nuclear Operating Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS
ON TECHNICAL SPECIFICATION CHANGE RELATED TO REVISED
ALLOWED OUTAGE TIME FOR AUXILIARY FEEDWATER PUMPS (TAC NOS.
MB3586 AND MB3590)

Dear Mr. Cottle:

The Commission has issued the enclosed Amendment No. 146 to Facility Operating License No. NPF-76 and Amendment No. 134 to Facility Operating License No. NPF-80 for the South Texas Project, (STP), Units 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated December 3, 2001, as supplemented by letter dated August 29, 2002.

The amendments revise TS 3.7.1.2, "Auxiliary Feedwater System," to better reflect the four train auxiliary feedwater (AFW) system design at STP. Specifically, the changes specify the same allowed outage time (AOT) for any one inoperable motor-driven pump, regardless of train. The amendments also extend the AOT for one inoperable motor-driven pump from 72 hours to 28 days. A sentence has also been added to Action d. stating that Limiting Condition for Operation (LCO) 3.0.3 and all other LCO actions requiring Mode changes are suspended until one of the four inoperable AFW pumps is restored to operable status. There is also an administrative change in the wording of the LCO to clarify that there are only four AFW pumps in each STP unit.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA by David H. Jaffe for/

Mohan Thadani, Senior Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosures: 1. Amendment No. 146 to NPF-76
2. Amendment No. 134 to NPF-80
3. Safety Evaluation

cc w/encls: See next page

Mr. William T. Cottle
 President and Chief Executive Officer
 STP Nuclear Operating Company
 South Texas Project Electric
 Generating Station
 P. O. Box 289
 Wadsworth, TX 77483

December 31, 2002

SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS ON TECHNICAL SPECIFICATION CHANGE RELATED TO REVISED ALLOWED OUTAGE TIME FOR AUXILIARY FEEDWATER PUMPS (TAC NOS. MB3586 AND MB3590)

Dear Mr. Cottle:

The Commission has issued the enclosed Amendment No. 146 to Facility Operating License No. NPF-76 and Amendment No. 134 to Facility Operating License No. NPF-80 for the South Texas Project, Units 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated December 3, 2001, as supplemented by letter dated August 29, 2002.

The amendments revise TS 3.7.1.2, "Auxiliary Feedwater System," to better reflect the four train auxiliary feedwater (AFW) system design at STP. Specifically, the changes specify the same allowed outage time (AOT) for any one inoperable motor-driven pump, regardless of train. The amendments also extend the AOT for one inoperable motor-driven pump from 72 hours to 28 days. A sentence has also been added to Action d. stating that Limiting Condition for Operation (LCO) 3.0.3 and all other LCO actions requiring Mode changes are suspended until one of the four inoperable AFW pumps is restored to operable status. There is also an administrative change in the wording of the LCO to clarify that there are only four AFW pumps in each STP unit.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,
/RA by David H. Jaffe for/
 Mohan Thadani, Senior Project Manager, Section 1
 Project Directorate IV
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

- Enclosures: 1. Amendment No. 146 to NPF-76
 2. Amendment No. 134 to NPF-80
 3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC PDIV-1 r/f G. Hill (4) WLeFave
 RidsNrrDlpmLpdv (WRuland) RidsNrrPMMThadani RidsNrrLAMMcAllister
 RidsNrrDripRorp (RDennig) RidsAcrsAcnwMailCenter RidsOgcRp
 RidsRgn4MailCenter (BJohnson) RidsNrrDlpmLpdv-1 (RGramm) MWohl
 Package: ML030090047 TS: ML030090449

ACCESSION NO: ML030090034

* See Previous Concurrence

NRR-058

OFFICE	PDIV-2/PM	PDIV-1/PM	PDIV-1/LA	SPLB
NAME	JHickman*	MThadani*	MMcAllister*	By Memo
DATE	10/11/2002	12/12/2002	10/10/2002	9/26/2002

OFFICE	SPSB	RORP/SC	OGC	PDIV-1/SC
NAME	By Memo	RDennig*	STurk*	RGramm
DATE	9/26/2002	12/10/2002	12/18/2002	12/31/2002

OFFICIAL RECORD COPY

STP NUCLEAR OPERATING COMPANY

DOCKET NO. 50-498

SOUTH TEXAS PROJECT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 146
License No. NPF-76

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by STP Nuclear Operating Company* acting on behalf of itself and for Texas Genco, LP, the City Public Service Board of San Antonio (CPS), Central Power and Light Company (CPL), and the City of Austin, Texas (COA) (the licensees), dated December 3, 2001, as supplemented by letter dated August 29, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

*STP Nuclear Operating Company is authorized to act for Texas Genco, LP, the City Public Service Board of San Antonio, Central Power and Light Company, and the City of Austin, Texas, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility Operating License No. NPF-76 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 146 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The STP Nuclear Operating Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: December 31, 2002

STP NUCLEAR OPERATING COMPANY

DOCKET NO. 50-499

SOUTH TEXAS PROJECT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 134
License No. NPF-80

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by STP Nuclear Operating Company* acting on behalf of itself and for Texas Genco, LP, the City Public Service Board of San Antonio (CPS), Central Power and Light Company (CPL), and the City of Austin, Texas (COA) (the licensees), dated December 3, 2001, as supplemented by letter dated August 29, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

*STP Nuclear Operating Company is authorized to act for Texas Genco, LP, the City Public Service Board of San Antonio, Central Power and Light Company, and the City of Austin, Texas, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility Operating License No. NPF-80 is hereby amended to read as follows:

- (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 134 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The STP Nuclear Operating Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: December 31, 2002

ATTACHMENT TO LICENSE AMENDMENT NOS. 146 AND 134

FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80

DOCKET NOS. 50-498 AND 50-499

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3/4 7-3*
3/4 7-4

INSERT

3/4 7-3*
3/4 7-4

*Overleaf page provided to maintain document completeness. No changes on this page.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 146 AND 134 TO
FACILITY OPERATING LICENSE NOS. NPF-76 AND NPF-80
STP NUCLEAR OPERATING COMPANY, ET AL.
SOUTH TEXAS PROJECT, UNITS 1 AND 2
DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

By application dated December 3, 2001, as supplemented by letter dated August 29, 2002, STP Nuclear Operating Company (the licensee), requested an amendment to the Technical Specifications (TSs) for South Texas Project (STP), Units 1 and 2. The supplement provided additional information that clarified the application, did not expand the scope as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on January 22, 2002, (67 FR 2930).

The licensee's proposed amendment would revise TS 3.7.1.2, "Auxiliary Feedwater System," to better reflect the four train auxiliary feedwater (AFW) system design at STP. Specifically, the change would specify the same allowed outage time (AOT) for any one inoperable motor-driven pump, regardless of train. The proposed amendment would also extend the AOT for one inoperable motor-driven pump from 72 hours to 28 days. A sentence has also been added to Action d. stating that Limiting Condition for Operation (LCO) 3.0.3 and all other LCO actions requiring Mode changes are suspended until one of the four inoperable AFW pumps is restored to operable status. There is also an administrative change in the wording of the LCO to clarify that there are only four AFW pumps in each STP unit.

The licensee's reason for the change is twofold. The current LCO for TS 3.7.1.2 states:

"At least four independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE....".

However, Action a. states :

"With the Train A motor-driven auxiliary feedwater pump inoperable, initiate corrective actions to restore the pump to OPERABLE status as soon as possible."

The action statement could be interpreted as allowing the Train A motor-driven AFW pump to be inoperable indefinitely because no AOT is specified in the Action statement. Thus, the

Action statement appears to be inconsistent with the LCO. The proposed change will make all the Action statements consistent with the LCO.

Secondly, the licensee is employing the STP Probabilistic Risk Assessment (PRA) to support extension of the AOT for one inoperable motor-driven pump. This will make the AOT more consistent with the four AFW train design and reduce unnecessary operator burden by providing more operational flexibility. The specific changes are described below.

The words "at least" will be deleted from the first sentence of the LCO for TS 3.7.1.2. The words could be interpreted to indicate there are more than four AFW pumps at each STP unit, which is incorrect; there are only four.

Actions a. (discussed above) and b. will be deleted and replaced completely. The current Action b. addresses different combinations of inoperable AFW pumps and provides a 72- hour AOT for all the identified combinations including the turbine-driven AFW pump. The new Action a. will address the case of one inoperable motor-driven pump (any train) and provide for a 28-day AOT. New Action b. will address the case of the turbine-driven AFW pump or any two AFW pumps being inoperable and will require restoration within 72 hours (i.e., a 72-hour AOT).

Action c. will be modified to address failure to meet the required action and associated AOT in Action a. or b., as well as the case of three inoperable AFW pumps. Currently, Action c. addresses three inoperable AFW pumps plus the case of Train B and Train C both being inoperable. The existing required action for Action c. will remain as currently stated: i.e., be in at least hot standby within six hours and in hot shutdown within the following six hours.

Finally, a sentence will be added to Action d. (four inoperable AFW pumps) stating that LCO 3.0.3 and all other LCO Mode changes are suspended until one of the four inoperable AFW pumps is restored to operable status.

2.0 REGULATORY EVALUATION

NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," includes Standard Technical Specification (STS) 3.7.5, "Auxiliary Feedwater System," which is generally applicable to Westinghouse plants with three AFW pumps. However, STP, which is a Westinghouse plant, employs a four-pump, four-train AFW system design that is unique to STP. Therefore, STS 3.7.5 cannot be directly applied to the STP AFW system and the existing STP TS 3.7.1.2 is a custom specification applicable only to STP.

Although the design consists of four trains with four pumps, each serving only one steam generator (with cross-connect capability), the automatic actuation system (Train A) has a worst-case single failure vulnerability which can prevent both Pump A (motor-driven) and Pump D (turbine-driven) from starting. Therefore, the current AFW TS was based on accident analyses which only took credit for two AFW pumps (Trains B and C) to provide flow to two steam generators. Throughout the course of the accident, no credit was taken for manually starting (from the control room) one of the AFW pumps (A or D) which failed to automatically start as a result of the engineered safety features actuation system Train-A failure. Therefore, the current specification is very conservative (72-hour AOT for an inoperable Pump B or C, and immediate shutdown if both Pumps B and C are inoperable) since it is based solely on one specific, low probability, postulated failure event. The proposed changes will bring the STP AFW system TS

closer to the intent of NUREG-1431, while still reflecting the four train design. In conjunction with the proposed TS change, the licensee is also revising the STP accident analyses to take credit for starting a third motor-driven AFW pump, 15 minutes into the analyses. This change will be done in accordance with 10 CFR 50.59. Therefore, the changes to add an AOT for motor-driven pump, Train A is more consistent with the changes to the accident analyses.

Loss of normal feedwater (LONF) results in a reduction in capability of the secondary system to remove the heat generated in the reactor core. If an alternative supply of feedwater were not provided to the plant, core residual heat following a reactor trip would heat the primary system water to the point where water relief from the pressurizer would occur, resulting in a substantial loss of water from the reactor coolant system (RCS).

The worst LONF event is one in which a loss-of-offsite power (LOOP) occurs coincident with reactor trip due to the decreased capability of the reactor coolant to remove residual core heat as a result of the reactor coolant pump coastdown. Plant specific analyses have shown that a LONF with a subsequent LOOP is the most limiting Condition II event in the decrease in secondary heat removal category with respect to the Pressurizer Overfill Criterion which is used in the Chapter 15, Updated Safety Analysis Report accident analyses. In the current Chapter 15 analyses, two AFW pumps are required to operate to prevent the pressurizer from going solid. However, only one AFW pump is required to operate to prevent core damage.

Westinghouse recently determined that the case of 0 percent tube plugging is most limiting for the LONF event with a coincident (or subsequent) LOOP analyses. With the current LONF/LOOP analyses being performed at 10 percent tube plugging, and with the small amount of margin to pressurizer overfill that currently exists, the 0 percent plugging assumption resulted in filling the pressurizer. As a result, the licensee intends to change (via 10 CFR 50.59) the LONF/LOOP analyses to take credit for starting the third motor-driven pump within 15 minutes which will provide sufficient added cooling to the RCS to avoid filling the pressurizer. However, one AFW pump is still sufficient to prevent core damage even with the new assumption (0 percent tube plugging).

3.0 PRA EVALUATION

3.1 PRA Discussion and Insights

In the STP PRA the success criterion is one of four auxiliary feedwater pump trains operable and delivering flow to its respective intact steam generator. The success criterion is two AFW pump trains operable for Anticipated Transient Without Scram events. Two pumps are required for the purpose of dissipating the additional heat that is generated as the result of not being shut down. AFW success in the PRA is relative to the figures-of merit analyzed by the PRA. In other words, the PRA analysis is based on preventing/mitigating the impact of core damage and/or radiological release.

The licensee defines a maintenance state as the collection of plant systems and components within the scope of the Configuration Risk Management Program (CRMP) that are non-functional simultaneously. As new maintenance states are encountered during plant operation, they are evaluated for impact on core damage frequency (CDF) and added to the Risk Assessment Calculator (RAsCal) database. The licensee performed a risk management analysis in support of the proposed 28 day motor-driven single AFW pump AOT in accordance

with procedure OPGP05-ZE-0001, "PRA Analyses/Assessments." The first part of the analysis investigated impacts of AOT changes for Train "A," "B," and "C," motor-driven AFW pumps, and ascertained the impact of multiple AOT options on core damage frequency/large early release frequency (CDF/LERF). The second part of the analysis determined the number of days that would pass before exceeding the non-risk significant threshold (as defined in procedure OPGP05-ZE-0001) using the models created in the first part of the analysis. The PRA is performed using the RISKMAN for Windows software with procedure OPGP05-ZE-0001 governing the method of application.

The components modeled in the AFW system PRA include:

- Motor-driven AFW pumps
- Motor-driven AFW pump cubicle heating, ventilation, and air conditioning (HVAC) supply fans
- AFW storage tank
- AFW automatic recirculation control valves
- AFW containment isolation stop check motor-operated valves (MOVs)
- AFW flow control MOVs
- AFW inside containment isolation check valves
- Turbine-driven AFW pump
- AFW pump turbine trip and throttle valve
- AFW pump turbine steam inlet MOV

The licensee made the following key assumptions in the AFW system PRA:

- No credit is taken for the crossover valves that allow an AFW pump to feed any steam generator.
- The following valves are closed during maintenance on the AFW pump in that train: pump suction, pump discharge, and pump recirculation line.
- The pump recirculation line is required to be open during pump operation.
- Maintenance on the AFW flow transmitters is not included in the scope of the AFW PRA because credit is taken for the operators manually controlling AFW flow.

The following support systems are considered in the AFW system PRA by the licensee:

- Main steam system
- Class IE 4.16 kV AC power distribution system
- Class IE 125 V DC power distribution system
- Class IE 480 V AC power distribution system
- Main steam isolation valve cubicle HVAC system
- Engineered safety features actuation system

3.2 Changes Made to PRA for Change Evaluation

The licensee's risk analysis used a model called AFWSTP99 that was created from the effective PRA Reference Model STP_1999. Modifications were made to AFWSTP99 to create the New Baseline Model A, which assumes all motor-driven AFW pumps are treated in the same way. Case studies 4 and 5 were quantified with minor variable changes using the AFWSTP99 New Baseline Model A configuration.

The PRA includes a top event for each of the four AFW trains. The licensee defines local unplanned maintenance variables for each train within the top event. All three trains of motor-driven AFW pumps are modeled independently with the same 72-hour unplanned maintenance duration distribution variable (mean value of 13.4 hours) and maintenance frequency (0.96 times per year). The cubicle fans for the motor-driven AFW pumps are tied logically to the operability of the pumps and are modeled in conjunction with them. Thus, the maintenance duration of the cubicle vent fans is also manipulated in the analysis. Because motor-driven AFW pump “A” is not controlled in the current TSs, a second pump outage in combination with the “A” pump is treated differently than the pump “B” and “C” combination. The Reference Model uses a 6-hour AOT for the cross-train of “B” and “C”, and a 72-hour AOT for the cross-trains of “A” and “B” and “A” and “C”.

In the first part of the analysis, the licensee performed two case studies with different AOTs in order to determine the change in CDF, change in LERF, incremental conditional core damage probability (ICCDP), and incremental conditional large early release probability (ICLERP):

- Case 4 - 14-day single-train AOT/72-hour cross-train AOT study.
- Case 5 - 28-day single-train AOT/72-hour cross-train AOT study.

The licensee performed a bounding case study quantification in the second part of the analysis, i.e., in determining the number of days elapsed before crossing the non-risk significant threshold (as defined in procedure OPGP03-ZA-0091). The licensee created a New Baseline Model B specifically for this study. The licensee considers this study to be bounding, since it is not the licensee’s intention to take all three motor-driven pumps of AFW out of service at its current maintenance frequency for the total AOT. Because the licensee includes random and planned maintenance within its average maintenance model, unplanned maintenance was removed from AFW modeling at the system level, but planned maintenance was left in the event tree level model. Though still conservative, the licensee maintains that this modification minimizes the effects of over-counting maintenance while a train of motor-driven AFW is taken out of service in the average maintenance model. It is important because unplanned maintenance is removed from the AFW in this model, therefore, modified AOTs manipulated in the first part of the analysis play no part in this quantification.

3.3 Tier 1 Evaluation

The following are a summary of the calculated Tier 1 risk measures:

Case Study	Single Train AOT	Cross-train AOT	AVG CDF(/yr)	AVG LERF(/yr)	delta CDF(/yr)	delta LERF(/yr)	ICCDP	ICLERP
4	14 day	72 hr	1.24E-5	5.83E-7	7.24E-7	1.9E-8	3.37E-8	5.58E-10
5	28 day	72 hr	1.32E-5	5.91E-7	1.51E-6	2.0E-8	1.28E-7	1.71E-9

As can be seen above, the first part of the licensee’s analysis demonstrates that the ICCDP and the ICLERP for Cases 4 and 5 are within the RG 1.177 guidelines of 5E-7 and 5E-8 respectively. Also, the delta CDF and delta LERF for the proposed 28-day AOT meet the

RG 1.174 (Reference 1) definitions of a small change (less than $1E-6$ /yr and less than $1E-7$ /yr). The licensee tracks cumulative risk impact via its CRMP.

The second part of the licensee's analysis shows that when all motor-driven AFW pumps are treated equally, and one motor-driven AFW pump is taken out of service with AFW unplanned maintenance removed from the quantification, the non-risk significant threshold will be crossed in approximately 28.7 days in all cases. Thus, the implementation of compensatory measures is called for.

3.4 Compensatory Measures

The licensee plans to implement the following compensatory measures for the proposed 28-day AFW AOT:

- Ensure that the work schedule contains no planned maintenance on required systems, subsystems, trains, components, and devices that depend or affect the remaining trains of AFW motor-driven pumps.
- Ensure that the work schedule contains no planned maintenance activities in the switchyard, which could directly cause a LOOP event. Maintenance activities identified after an extended AOT which are required to ensure the continued reliability and availability of the offsite power sources are permitted.
- If in MODE 1, 2, or 3, then verify that the work schedule contains no planned maintenance on the steam-driven auxiliary feedwater pump.
- Ensure that the work schedule contains no planned maintenance which would result in the essential cooling water and the systems it supports being declared non-functional.
- Ensure that the work schedule contains no planned maintenance that would result in an inoperable open containment penetration.
- Ensure that the work schedule contains no planned maintenance on switchgear 1L (2L) or 1K(2K).
- Ensure that the work schedule contains no planned maintenance on the 138kV emergency transformer.

3.5 Tier 2 Evaluation

The licensee's Tier 2 evaluation identifies, for purposes of avoidance, potentially high risk configurations that could exist if equipment in addition to that associated with the proposed AFW pump AOT change were to be taken out of service simultaneously, or other risk-significant operational factors, such as concurrent system or equipment testing, were also involved. For this evaluation, the Average Plant Model was used, which accounts for average maintenance procedures, both planned and unplanned, occurring concurrent with the proposed change.

3.6 Tier 3 Evaluation

A Tier 3 evaluation was not necessary because the licensee has a CRMP in place; 10 CFR 50.65(a)(4) requirements are also met.

3.7 Modeling Assumptions

1. The following assumptions were made by the licensee in accordance with RG 1.177 (Reference 2):
 - CDF and LERF were estimated using the mean outage times for the current and proposed AOT duration distributions.
 - The average downtime for the motor-driven AFW pumps was assumed to increase pro-portionally with the proposed AOT for downtimes associated with unscheduled maintenance.
 - Scheduled preventive maintenance downtime is representative of current plant practice.
2. Cubicle vent fan AOT is assumed to be the same as the associated motor-driven AFW pump AOT.
3. All other assumptions in PRA STP_1999 are unaffected by the analyses presented here and remain valid.

3.8 Applicability and Quality of PRA Models for Evaluation

The licensee has a Level 1/Level 2 PRA and Individual Plant Examination (IPE) that includes external events. The external events portion contains a fire, flood, and seismic PRA analysis. The PRA has been structured to have a comprehensive treatment of common cause failures and plant configurations, with a detailed human reliability analysis also included.

The licensee's PRA has undergone several extensive NRC staff reviews in partial support of proposed license amendments:

- "A Review of the South Texas Probabilistic Safety Analysis for Accident Frequency Estimates and Containment Binning," Sandia National Laboratories, NUREG/CR-5606, dated August 1991.
- "Safety Evaluation by the Office of Nuclear Reactor Regulation Related to the Probabilistic Safety Analysis Evaluation," sent to Houston Lighting and Power Company under cover letter dated January 21, 1992 (ST-AE-HL-92962).
- "Safety Evaluation by the Office of Nuclear Reactor Regulation Related to the Probabilistic Safety Assessment-External Events," sent to Houston Lighting and Power Company under cover letter dated August 31, 1993 (ST-AE-HL-93526).

- “Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment Nos. 59 and 47 to Facility Operating Licenses NPF-76 and NPF-80,” sent to Houston Lighting and Power Company under cover letter dated February 17, 1994.
- “Staff Evaluation of South Texas Project Individual Plant Examination (IPE) (Internal Events Only),” sent to Houston Lighting and Power Company under cover letter dated August 9, 1995 (ST-AE-HL-94279) (included equipment survivability analysis).
- “Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment Nos. 85 and 72 to Facility Operating License Nos. NPF-76 and NPF-80,” sent to Houston Lighting and Power Company under cover letter dated October 31, 1996 (ST-AE-HL-94678). This amendment allowed extension of the standby diesel generator AOT to 14 days and extension of the essential cooling water and essential chilled water AOTs to 7 days.
- “Safety Evaluation by the Office of Nuclear Reactor Regulation, Houston Lighting and Power Company, South Texas Project, Units 1 and 2, Graded Quality Assurance Program,” sent to Houston Lighting and Power Company under cover letter dated November 6, 1997.
- “Safety Evaluation by the Office of Nuclear Reactor Regulation, Risk-Informed Exemptions from Special Treatment Requirements,” sent to STP Nuclear Operating Company under cover letter dated August 3, 2001 (AE-NOC-01000845).

3.9 Contemporaneous Assessment of the Impact on Plant Safety

The licensee currently has in place a risk-informed, on-line maintenance tracking and control process. The CRMP was incorporated into the TS via Amendments 85 and 72, issued on October 31, 1996. In its Safety Evaluation, the NRC staff concluded that the licensee had “provided the necessary assurances that appropriate assessments of the overall impacts on safety functions will be performed prior to any maintenance or other operational activities, including removal of equipment from service.”

The CRMP is used to assess the risk impact of equipment-out-of-service, to maintain plant risk at desired levels, and to assess risk impacts for planned and unplanned equipment outages that are modeled in the licensee’s PRA. The CRMP is applicable to systems, structures, and components (SSCs) within the scope of the plant’s PRA as reflected in RAsCal for MODE 1 and 2 operations and Shutdown Risk Assessment for MODES 5, 6, and Defueled.

The CRMP satisfies the requirements of the Maintenance Rule to assess the cumulative effects of maintenance and testing on the SSC. The CRMP governing procedure, OPG03-ZA-0091, satisfies the Maintenance Rule requirements for the applicable modes, as specified in 10 CFR 50.65(a)(4).

RAsCal is the computer software used to assess the changes in CDF due to varying plant configurations resulting from planned or unplanned maintenance activities on risk-significant equipment in MODES 1 and 2.

The licensee's Risk and Reliability Analysis Section assesses the annual cumulative risk for each unit and communicates the results to affected personnel. Work schedules are then adjusted in accordance with desired risk levels for MODES 1 and 2. Unplanned Event Risk Assessments are made for MODES 1 and 2 and outage schedules and risk assessments are performed for MODES 5, 6, and Defueled. The risk assessments consider any significant performance issues associated with the standby trains of the SSC.

3.10 On-line Maintenance

As equipment becomes functional or non-functional, the designated on-shift Senior Reactor Operator is responsible for ensuring that the weekly risk profile is updated with actual back-in service times and actual out-of-service times for the SSC modeled in RAsCal.

3.11 Unplanned Events

During an unplanned event, the Shift Supervisor determines whether the SSC involved is within the scope of RAsCal. If the SSC is not within the scope of RAsCal, the CRMP does not apply. The designated on-shift Senior Reactor Operator calculates a projected weekly cumulative risk for the expected duration of the Unplanned Event. If the projected weekly cumulative risk will not exceed the Non Risk-Significant Threshold ($1.0E-6$ events/yr), no further action is required. The Shift Supervisor may heighten plant awareness of work that is risk-significant to ensure completion of the work as scheduled.

3.12 Risk Reduction

If the Non Risk-Significant Threshold is projected to be exceeded within the current work week and the exceedance has not been previously approved by the Plant Manager, the Shift Supervisor notifies the Duty Operations and Duty Plant Manager, and identifies and implements compensatory measures approved by the Duty Plant Manager. If the Potentially Risk-Significant Threshold ($1.0E-5$ events/yr) is projected to be exceeded within the current work week, the Shift Supervisor notifies the Duty Operations Manager and the Duty Plant Manager, and reviews the TSS, Technical Requirements Manual, and the Offsite Dose Calculation Manual for affected equipment to ensure that associated actions are being performed. The Shift Supervisor also evaluates changing current plant conditions to place the unit in a MODE or a power level that may reduce the relative risk.

3.13 Summary

The NRC staff concludes that the impact on plant risk of allowing a 28-day at-power AOT for the STP, Units 1 and 2, for any inoperable motor-driven AFW pump, regardless of train, is very small for internal and external events. The staff thus recommends that the proposed 28-day AOT be allowed.

4.0 TS CHANGE EVALUATION

The licensee's proposed change to delete the words "at least" from the LCO for TS 3.7.1.2 is administrative in nature, and is acceptable because it clarifies the LCO to reflect the actual four-pump, four-train design of the STP AFW system.

The proposed change to delete the current Action a. for motor-driven Pump A, and replace it with a common Action a. for all three motor-driven pumps is supported by the new Chapter 15 accident analyses, and more accurately reflects the four train design of the AFW system. It is also more consistent with the intent of NUREG-1431 because all four pumps will now have a defined AOT. Additionally, it is more conservative than the current TS which allows the motor-driven AFW Pump A to be out indefinitely.

In addition to the risk justification, the NRC staff requested the licensee for a deterministic justification for the 28-day AOT in Action a. for each of the motor-driven pumps. In its supplemental letter of August 29, 2002, the licensee stated that the AFW pump motor vendor verified that 14 days is the minimum time required to rewire a badly damaged motor. This is in addition to motor removal, transportation, reinstallation, and testing time. A total of 28 days is justifiable from the standpoint of actual time required to make repairs and has been justified on a risk basis. According to the licensee, plant safety and availability are enhanced by avoiding unnecessary transients (shutting down), and avoiding a request for enforcement discretion, which could be justified by the STP PRA.

Based on the above, and on the NRC staff's evaluation of the supporting risk analysis, the staff concludes that the proposed new Action a. for all three motor-driven pumps, including the 28-day AOT, is acceptable.

The proposed new Action b. provides a 72-hour AOT for an inoperable turbine driven pump, or any 2 inoperable AFW pumps. The 72-hour AOT for the turbine-driven AFW pump is the same as the current AOT and is, therefore acceptable. The current Action b. provides a 72-hour AOT for most combinations of 2 inoperable AFW pumps, except that it also provides a 72-hour AOT for either Pump B or Pump C. The current 72-hour AOT for either Pump B or Pump C was provided because of the worst-case single-failure vulnerability that could prevent both AFW Pumps A and D from automatically starting which would result in only one AFW pump. Therefore, the single-failure criterion could not be met (since no credit was given for operator action) with Pump B or C inoperable. However, the new accident analysis which takes credit for operator action effectively eliminates that single failure vulnerability by providing compensatory measures to start an AFW pump from the control room if the worst-case single failure were to occur. Thus, an inoperable Pump B or Pump C can now be addressed by new Action a. Since an inoperable Pump B or Pump C will now be addressed by the new Action a., new Action b. is very similar to the existing Action b for two inoperable AFW pumps. With two inoperable AFW pumps, the STP four train design will still have two operable pumps and trains remaining which is basically the same as the NUREG-1431 AFW TS when one train is inoperable. Therefore, the proposed 72-hour AOT for any 2 AFW pumps is consistent with the intent of NUREG-1431. Based on the above, the proposed new Action b. is acceptable.

The current Action c. addresses two cases; three inoperable AFW pumps, and the case where Pumps B and C are both inoperable. Currently, with Pumps B and C both inoperable there is no AOT because of the worst-case single-failure vulnerability and no credit for operator action as discussed above. The proposed new Action c. eliminates the case where Pumps B and C are inoperable as that case is now covered by the new Action b. (72-hour AOT). The required Action for three inoperable AFW pumps has not changed from the current Action c. The proposed change to Action c. is therefore acceptable.

Current Action d. addresses four inoperable AFW pumps and requires immediate action to restore one AFW pump to OPERABLE status. The proposed change modifies this required action by adding "LCO 3.0.3 and all other LCO actions requiring Mode changes are suspended until one of the four inoperable auxiliary feedwater pumps is restored to OPERABLE status." This modification is necessary because Mode changes cannot be made with no operable AFW pumps. It is also consistent with NUREG-1431 required actions for no operable AFW pumps. The proposed change to Action d. of TS 3.7.1.2 is therefore acceptable.

Based on its review as described above, the NRC staff concludes that the proposed changes to TS 3.7.1.2 provide clarification to the LCO, are more conservative with respect to AFW motor-driven Pump A, more closely reflect the STP four train design, and are necessary to address the situation where all AFW pumps are inoperable. The staff also concludes that the risk assessment supports the proposed 28-day AOT for any inoperable motor-driven pump. Furthermore, the proposed changes result in an AFW system TS which more closely meets the intent of NUREG-1431 given the four train design. The licensee's proposed changes to AFW system TS 3.7.1.2 are therefore acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Texas State official was notified of the proposed issuance of the amendments. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 2930 dated January 22, 2002). The amendments also relate to changes in administrative procedures. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

8.0 REFERENCES

- a. U.S. Nuclear Regulatory Commission Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," July 1998.
- b. U.S. Nuclear Regulatory Commission Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," August 1998.

Principal Contributors: Bill LeFave
Millard Wohl

Date: December 31, 2002

South Texas, Units 1 & 2

cc:

Mr. Cornelius F. O'Keefe
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 910
Bay City, TX 77414

A. Ramirez/C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Mr. M. T. Hardt
Mr. W. C. Gunst
City Public Service Board
P. O. Box 1771
San Antonio, TX 78296

Mr. C. A. Johnson/R. P. Powers
AEP - Central Power and Light Company
P. O. Box 289
Mail Code: N5022
Wadsworth, TX 77483

INPO
Records Center
700 Galleria Parkway
Atlanta, GA 30339-3064

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

D. G. Tees/R. L. Balcom
Texas Genco, LP
P. O. Box 1700
Houston, TX 77251

Judge, Matagorda County
Matagorda County Courthouse
1700 Seventh Street
Bay City, TX 77414

A. H. Gutterman, Esq.
Morgan, Lewis & Bockius
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Mr. T. J. Jordan, Vice President
Engineering & Technical Services
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

S. M. Head, Manager, Licensing
Nuclear Quality & Licensing Department
STP Nuclear Operating Company
P. O. Box 289, Mail Code: N5014
Wadsworth, TX 77483

Environmental and Natural Resources
Policy Director
P. O. Box 12428
Austin, TX 78711-3189

Jon C. Wood
Matthews & Branscomb
112 East Pecan, Suite 1100
San Antonio, TX 78205

Arthur C. Tate, Director
Division of Compliance & Inspection
Bureau of Radiation Control
Texas Department of Health
1100 West 49th Street
Austin, TX 78756

Brian Almon
Public Utility Commission
William B. Travis Building
P. O. Box 13326
1701 North Congress Avenue
Austin, TX 78701-3326

September 2002

Susan M. Jablonski
Office of Permitting, Remediation
and Registration
Texas Commission on
Environmental Quality
MC-122
P.O. Box 13087
Austin, TX 78711-3087

G. R. Bynog, Program Manager/
Chief Inspector
Texas Department of Licensing
and Regulation
Boiler Division
P. O. Box 12157, Capitol Station
Austin, TX 78711

Mr. Ted Enos
4200 South Hulen
Suite 630
Ft. Worth, Texas 76109