March 25, 2004

Mr. James J. Sheppard
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 - RELIEF FROM THE REQUIREMENTS OF AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE FOR REPAIR OF FLAWS INVOLVING DEALLOYING (TAC NO. MC0803, MC1667 AND MC1668)

Dear Mr. Sheppard:

By letters dated March 4, 2003, and two letters dated December 15, 2003, South Texas Project Nuclear Operating Company (the licensee) requested relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI requirements. The proposed reliefs address repair to discolored indications due to through-wall dealloying in Class 3, low energy pipe at South Texas Project, Units 1 and 2 (STP-1, STP-2) Essential Cooling Water System (ECWS) as follows:

- RR-ENG-2-29 for a flaw in a tee located in the STP-1 ECWS return line
- RR-ENG-2-37 for a flaw in STP-1 ECWS Essential Chiller 12B return valve
- RR-ENG-2-38 for a flaw in STP-2 ECWS Self-Cleaning Strainer 2B emergency backwash valve

The staff has reviewed the licensee's requests for relief (RR-ENG-2-29, RR-ENG-2-37, and RR-ENG-2-38) and find that the licensee's evaluations are acceptable. Further, the staff finds that performing Code repairs on the specified ECWS components within the allowed outage time is not practical. Based on its review, the staff concludes that granting relief from the Code repair requirements pursuant to 50.55a(g)(6)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR) is authorized by law and will not endanger life or property or common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the specified relief requests are granted pursuant to 10 CFR 50.55a(g)(6)(i) for STP-1 and STP-2 until a Code repair can be performed during the next outage of sufficient duration, but no later than the next refueling outage, which was March 2003 for RR-ENG-2-29, will be March 2005 for RR-ENG-2-37, and will be March 2004 for RR-ENG-2-38.

The NRC staff's safety evaluation is enclosed.

Sincerely,

/RA/

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

Docket Nos. 50-498 and 50-499

Enclosure: Safety Evaluation

cc w/encl: See next page

The NRC staff's safety evaluation is enclosed.

Sincerely,

/RA/

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

Docket Nos. 50-498 and 50-499

Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:
PUBLIC
RidsOgcRp
PDIV-1 Reading
RidsAcrsAcnwMailCenter
RidsNrrDlpmLpdiv (HBerkow)
GHill (4)
RidsNrrDlpmLpdiv1 (RGramm)
TChan/AKeim
RidsNrrPMDJaffe
MFields, RIV Plants (MBF1)
RidsNrrLADBaxley
Rebecca Tedessee, RIV EDO
RidsRgn4MailCenter (AHowell)

Accession No. ML040860117 *See previous concurrence

OFFICE	PDIV-1/PM	PDIV-1/LA	EMCB/DE	OGC	PDIV-1/SC
NAME	MWebb for DJaffe	DBaxley	TChan*	RHoefling*	RGramm
DATE	3/24/04	3/24/04	3/8/04	3/16/04	3/24/04

OFFICIAL RECORD COPY

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUESTS FOR RELIEF RR-ENG-2-29, RR-ENG-2-37 AND RR-ENG-2-38

FOR REPAIR OF CLASS 3 PIPING

ESSENTIAL COOLING WATER SYSTEM FLAWS RESULTING FROM DEALLOYING

SOUTH TEXAS PROJECT NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

By letter dated March 4, 2003, and two letters dated December 15, 2003, South Texas Project Nuclear Operating Company (the licensee) requested relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI requirements. The proposed reliefs address repair to discolored indications due to through-wall dealloying in Class 3, low energy pipe at South Texas Project, Units 1 and 2 (STP-1, STP-2) Essential Cooling Water System (ECWS) as follows:

- RR-ENG-2-29 for a flaw in a tee located in the STP-1 ECWS return line
- RR-ENG-2-37 for a flaw in STP-1 ECWS Essential Chiller 12B return valve
- RR-ENG-2-38 for a flaw in STP-2 ECWS Self-Cleaning Strainer 2B emergency backwash valve

Discoloration of aluminum-bronze indicates a through-wall dealloying defect. However, there was no active leakage or moisture at the locations. The licensee attributed the dealloying to a combination of an existing crevice and susceptible material.

The licensee determined that the Code repair of the subject ECWS components within the allowed outage time might not be practical because of potential fit-up problems during repair. Hence, the licensee submitted the relief requests in accordance with the provisions of Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping." The licensee requested relief until a Code repair can be performed during the next outage of sufficient duration but no later than the next refueling outage, which was March 2003 for RR-ENG-2-29, will be March 2005 for RR-ENG-2-37, and will be March 2004 for RR-ENG-2-38.

2.0 BACKGROUND

In accordance with 50.55a(g) of Title 10 of the *Code of Federal Regulations* (10 CFR), nuclear power facility piping and components must meet the applicable requirements of Section XI of the ASME Code. Section XI of the Code specifies Code-acceptable repair methods for flaws that exceed the Code acceptance limits of piping that is in-service. A Code repair is required to restore the structural integrity of flawed Code piping, independent of the operational mode of

the plant when the flaw is detected. However, implementation of a required Code repair to ASME Code Class 1, 2, or 3 systems is often impractical for nuclear licensees since repairs typically require the isolation of the system to perform the repair, and often require a shutdown of the nuclear power plant. Repairs that are not in compliance with Section XI of the Code are non-Code repairs.

Alternatives to Code requirements may be used by nuclear licensees when authorized by the NRC if the proposed alternatives to the requirements are such that they are shown to provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i), or if compliance with the Code requirements would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(ii). A licensee may also submit requests for relief from certain Code requirements when a licensee has determined that conformance with the Code requirements are impractical for its facility in accordance with 10 CFR 50.55a(g)(5)(iii). Pursuant to 10 CFR 50.55a(g)(6)(i), the Commission will evaluate determinations of impracticality and may grant relief and may impose alternative requirements as it determines is authorized by law.

GL 90-05 provides guidance for performing temporary non-Code repairs of ASME Class 1, 2, and 3 piping. Specifically, for Code Class 1 and 2 piping, the licensee is required to perform the Code repairs or request that the NRC grant relief for temporary repairs on a case-by-case basis regardless of pipe size. For Class 3 piping, licensees can perform temporary non-Code repairs as long as they follow the guidance in GL 90-05. The licensee is required to document the repair by requesting that the NRC grant relief for the temporary non-Code repair of Class 3 piping. The NRC staff uses the guidance of GL 90-05 as its criteria for evaluating relief requests for temporary non-Code repairs.

3.0 EVALUATION OF RELIEF REQUEST

3.1 Components for Which Relief is Requested:

- RR-ENG-2-29: STP-1 ECWS emergency diesel generator #13 intercooler return line 10-inch by 10-inch by 6-inch tee (1/2-inch diameter exterior discoloration)

- RR-ENG-2-37: STP-1 ECWS Essential Chiller 12B return valve 8-inch flange (1/4-inch diameter round residue deposit and a 1/2-inch diameter discoloration)

- RR-ENG-2-38: STP-2 ECWS Self-Cleaning Strainer 2B Emergency Backwash Valve 6-inch flange (1/4-inch wide by 1-inch long discoloration)

3.2 Code Requirement from Which Relief is Requested (as stated):

Relief from the requirements of ASME Section XI IWA-5250(a)(3) is requested so that code repair of the through-wall flaws in Essential Cooling Water piping may be deferred until the next Unit 1 and Unit 2 outages of sufficient duration.

3.3 Basis for Relief

The licensee has determined that it is impractical to perform the Code repair of the subject components within the time frame allowed by the limiting condition of operation (LCO) as specified in the plant's technical specifications (TSs). The repairs may not be practical due to the potential for fit-up problems during the repair. If the Code repair cannot be completed within the time frame allowed by the LCO, a plant shutdown would be required.

GL 90-05 provides evaluation guidelines for temporary non-Code repairs of Code Class 3 piping in moderate energy systems. The licensee previously supplied calculations in a submittal dated August 10, 2000, "Calculation of Critical Bending Stress for Dealloyed Aluminum-Bronze Castings in the ECW System." These calculations are in accordance with the guidance provided in GL 90-05. These results show that the flaws in the subject ECWS components satisfy the acceptance criteria provided in GL 90-05 for non-Code repairs.

3.4 Licensee's Alternative Program

Repair of the defects will be deferred until adequate time is available for the repair, but no later than the next STP-1 and STP-2 refueling outages (for RR-ENG-2-29, code repairs were to have been performed during the March 2003 outage), provided the conditions continue to meet the acceptance criteria of GL 90-05 and are enveloped by the analysis described in Section C3 of the licensee's submittals dated March 4, 2003, and December 15, 2003. The licensee proposes to perform the following inspections to ensure the structural integrity of the flawed components and other components susceptible to dealloying in ECW system:

(1) Monthly monitoring for qualitative assessment of leakage (quantitative if measurable leaks are observed). Currently there is no measurable leakage.

(2) Continuation of ECWS large bore piping periodic walkdowns. These walkdowns are regularly scheduled VT-2 examinations. The inspection technique has proven to be an effective means of identifying dealloyed/cracked components prior to deterioration of structural integrity margins below ASME Code, Section XI requirements.

Structural integrity and the monitoring frequency will be re-evaluated if significant changes in the condition of the dealloyed areas are found during the monitoring.

4.0 STAFF EVALUATION

4.1 Impracticality Determination

In GL 90-05, impracticality is defined to exist if the flaw detected during plant operation is in a section of Class 3 piping that cannot be isolated or the performance of a Code repair may require a plant shutdown if the repair cannot be completed within the time permitted by the LCO as specified in the plant's TSs.

The flaws were found during normal plant operations while performing the periodic examinations of ECWS large bore piping at STP-1 and STP-2. The licensee has a concern about immediately performing the Code repairs because the plant would have to shut down if the potential fit-up problem could not be resolved within the time frame allowed by the LCO in

the plant TSs. The licensee's concern is reasonable as the unanticipated plant shutdown would result in a burden upon the licensee. In addition, the discovered dealloying was very minor and is not expected to have any significant impact on the operability of the ECWS. The unanticipated plant shutdown would create transients in the operating plant. The transients result from cool-down and heat-up of the plant and are not desirable because they can challenge the integrity of the reactor vessel, as well as the safety-related piping. Furthermore, the additional cycles of plant cool-down and heat-up would reduce the margins of the allowable fatigue usage factors for the components. Therefore, based on a comparison of potential failure consequences, an unanticipated plant shutdown resulting due to the need for immediate Code repairs could have a much larger impact.

5.0 CONCLUSION

The staff has reviewed the licensee's requests for relief (RR-ENG-2-29, RR-ENG-2-37, and RR-ENG-2-38) and find that the licensee's evaluations are acceptable. Further, the staff finds that performing Code repairs on the specified ECWS components within the allowed outage time is not practical. Based on its review, the staff concludes that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) from the Code repair requirements is authorized by law and will not endanger life or property or common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, the specified relief requests are granted pursuant to 10 CFR 50.55a(g)(6)(i) for STP-1 and STP-2 until a Code repair can be performed during the next outage of sufficient duration, but no later than the next refueling outage, which was March 2003 for RR-ENG-2-29, will be March 2005 for RR-ENG-2-37, and will be March 2004 for RR-ENG-2-38.

Principal Contributor: A. Keim
D. Jaffe

Date: March 25, 2004

South Texas Project, Units 1 & 2

cc:

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. L. K. Blaylock
Mr. W. C. Gunst
City Public Service Board
P. O. Box 1771
San Antonio, TX 78296

Mr. C. A. Johnson/A. C. Bakken
AEP Texas Central 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

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

Mr. Terry Parks, Chief Inspector
Texas Department of Licensing
and Regulation
Boiler Division
P. O. Box 12157
Austin, TX 78711

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