September 26, 2008

Mr. Edward D. Halpin
Chief Nuclear Officer
STP Nuclear Operating Company
South Texas Project
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNIT 2 - RELIEF REQUEST RR-ENG-2-49, DEFERRAL OF CODE REPAIR IN THE ESSENTIAL COOLING WATER SYSTEM PIPING (TAC NO. MD7495)

Dear Mr. Halpin:

By letter dated September 6, 2007, to the U.S. Nuclear Regulatory Commission (NRC), as supplemented by letter dated May 14, 2008, STP Nuclear Operating Company (the licensee) submitted Relief Request RR-ENG-2-49. Relief Request RR-ENG-2-49 was submitted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a, paragraph (g)(5)(iii). Specifically, the licensee requested relief from certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, and proposed to defer permanent Code repair of a flaw in Essential Cooling Water (ECW) system valve 2-EW-0204 at South Texas Project (STP), Unit 2, until the next refueling outage, which is scheduled to begin in October 2008. The applicable ASME Code for the second 10-year inservice inspection interval at STP, Unit 2, is the 1989 Edition.

The proposed alternative is to defer repair of the flaw in valve 2-EW-0204 until adequate time is available for the repair, but no later than the next Unit 2 refueling outage. The licensee implemented compensatory action to detect changes in the condition of the flaw until it is permanently repaired.

Based on the information provided by the licensee in Relief Request RR-ENG-2-49, the NRC staff finds that requiring immediate repair of valve 2-EW-0204 in accordance with the ASME Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee's proposed alternative provides reasonable assurance of structural integrity of the ECW system. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative in Relief Request RR-ENG-2-49 until completion of the next STP, Unit 2, refueling outage, which is scheduled to begin in October 2008.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please call Mr. Mohan Thadani of my staff at (301) 415-1476.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-499

Enclosure:
As stated

cc w/encl: See next page

The detailed results of the NRC staff review are provided in the enclosed safety evaluation. If you have any questions concerning this matter, please call Mr. Mohan Thadani of my staff at (301) 415-1476.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-499

Enclosure:
As stated

cc w/encl: See next page

DISTRIBUTION:
PUBLIC
LPLIV Reading
RidsAcrsAcnw_MailCTR Resource
RidsNrrDciCpnb Resource
RidsNrrDorlLpl4 Resource
RidsNrrLAJBurkhardt Resource
RidsNrrPMMThadani Resource
RidsOgcRp Resource
RidsRgn4MailCenter Resource
MCox, EDO RIV
JTsao, NRR/DCI/CPNB

**ADAMS Accession No. ML082490160** *memo dated **See previous concurrence

| OFFICE | NRR/LPL4/PM | NRR/LPL4/LA | CPNB/BC | OGC – NLO w/comments | NRR/LPL4/BC |
|---|---|---|---|---|---|
| NAME | MThadani | JBurkhardt (**) | TChan (*) | JBielecki (**) | MMarkley |
| DATE | 9/25/08 | 9/18/08 | 7/14/08 | 9/24/08 | 9/26/08 |

**OFFICIAL RECORD COPY**

cc:
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 289
Wadsworth, TX 77473

C. Kirksey
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

J. J. Nesrsta/R. K. Temple
Ed Alarcon/Kevin Pollo
City Public Service
P.O. Box 1771
San Antonio, TX 78296

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

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

Mr. Kevin Howell, Ms. Catherine Callaway,
and Mr. Jim von Suskil
NRG Energy, Inc.
1301 McKinney, Suite 2300
Houston, TX 77010

Mr. Nate McDonald
County Judge for Matagorda County
1700 7th Street, Room 301
Bay City, TX 77414

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

Mr. Tim Powell
Vice President, Engineering
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

Mr. David W. Rencurrel
Site Vice President
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

Mr. A. W. Harrison, Manager, Licensing
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

Charles T. Bowman
General Manager, Oversight
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

Ms. Marilyn Kistler
Senior Staff Specialist, Licensing
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

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

Mr. Jon C. Wood
Cox, Smith, & Matthews
112 E. Pecan, Suite 1800
San Antonio, TX 78205

Mr. Richard A. Ratliff
Radiation Control Program Director
Texas Department of State Health Services
Bureau of Radiation Control
1100 W. 49th Street
Austin, TX 78756

Mr. Ted Enos
4200 S. Hulen, Suite 422
Ft. Worth, TX 76109

Mr. Brian Almon
Public Utility Commission of Texas
P.O. Box 13326
Austin, TX 78711-3326

Ms. 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. Ken L. Coates
Plant General Manager
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

Mr. Anthony P. Jones, Chief Boiler Inspector
Texas Department of Licensing
and Regulation
Boiler Division
E.O. Thompson State Office Building
P.O. Box 12157
Austin, TX 78711

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST RR-ENG-2-49

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNIT 2

DOCKET NO. 50-499

## 1.0 INTRODUCTION

By letter dated September 6, 2007 (Agencywide Document Access and Management System (ADAMS) Accession No. ML072600151), to the U.S. Nuclear Regulatory Commission (NRC), as supplemented by letter dated May 14, 2008 (ADAMS Accession No. ML081440426), STP Nuclear Operating Company (the licensee) submitted Relief Request RR-ENG-2-49. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a, paragraph (g)(5)(iii), the licensee proposed to defer the repair of degraded valve 2-EW-0204 in the Essential Cooling Water (ECW) system at South Texas Project (STP), Unit 2, until the next scheduled refueling outage. The licensee requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, Subarticle IWA-5250.

## 2.0 REGULATORY EVALUATION

As specified in 10 CFR 50.55a(g)(4), inservice inspection of nuclear power plant components shall be performed in accordance with the requirements of ASME Code, Section XI, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). As stated in 10 CFR 50.55a(g)(5)(iii), "[i]f the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in §50.4, information to support the determinations." After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), "[t]he Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the 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."

Pursuant to 10 CFR 50.55a(a)(3), alternatives to requirements may be authorized by the NRC if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The Code of record at STP, Unit 2 is the ASME Code, Section XI, 1989 Edition for the repair and replacement program activities during the current second 10-year inservice inspection interval.

## 3.0 TECHNICAL EVALUATION

### 3.1 Components for Which Relief is Requested

Return flow balance throttle valve (2-EW-0204), which is used for Standby Diesel Generator (SBDG) #23 engine cooling, is an ASME Code Class 3, Aluminum-Bronze (SB 148 CA 954) valve in the Essential Cooling Water (ECW) system.

### 3.2 Applicable Code Edition and Addenda

ASME Code, Section XI, 1989 Edition

### 3.3 Applicable Code Requirement (As stated by the licensee)

> ASME Section XI, IWA-5250(a)(3) requires that the source of leakage be evaluated for repair or replacement in accordance with IWA-4000 or IWA-7000. Relief from the requirements of IWA-5250(a)(3) is requested so that code repair of the through-wall flaw at this location may be deferred until the next outage of sufficient duration but not later than the next refueling outage provided the conditions of Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping," are met.

### 3.4 Proposed Alternative and Basis for Use

#### 3.4.1 Proposed Alternative

The proposed alternative is to defer the repair of valve 2-EW-0204 until adequate time is available for the repair, but no later than the next Unit 2 refueling outage, provided the condition continues to meet the acceptance criteria of NRC's Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping." The licensee stated that "The next Unit 2 refueling outage is currently scheduled to begin in October 2008. Compensatory action has been implemented to detect changes in the condition of the flaw until a repair can be implemented."

#### 3.4.2 Basis for Use

The licensee proposed the alternative in Relief Request RR-ENG-2-49 based on its consequence assessment, root cause determination, flaw evaluation, augment inspection, and impracticality determination.

In its submittal dated September 6, 2007, the licensee stated that:

> Consequences of potential system interactions, including flooding, spray on equipment, and loss of flow to the system, are addressed in Appendix 9A of the South Texas Project Updated Final Safety Analysis Report, "Assessment of the Potential Effects of Through-Wall Cracks in ECWS Piping." The assessment assumes the effects of spray from a moderate energy line (10-inch diameter). Safety-related equipment is either designed to operate in a spray environment, or protected if sensitive to spray. Flooding in a given area due to the ECW system is enveloped by worst case flow from an opening in a local pipe due to a "critical crack," with an area equivalent to a rectangle of length

> one-half the pipe diameter and a width equal to one-half the pipe-wall thickness. This assessment is bounding for the condition under consideration.
>
> Loss of operability of the affected SBDG will not prevent safe shutdown of the plant from being achieved.
>
> The ECW System is designed to supply cooling water to various safety-related systems for normal plant operation, normal shutdown, and during and after postulated design-basis accidents.
>
> The ECW system is a low-pressure system with normal operating pressures of approximately 50 psig [pounds per square inch gauge] and a design pressure of 120 psig. Normal temperature with the diesel in standby is 47 to 95 degrees and up to 115 degrees F [Fahrenheit] with the diesel running. Temperature with the diesel running following a design-basis accident is not expected to exceed 123 degrees F. Therefore, the consequences associated with failure of high-energy lines are not applicable to this relief request.
>
> The root cause of dealloying is a combination of corrosion and stress. The dealloying process normally initiates from a crevice such as the area behind a backing ring, a fabrication-induced flaw, or a casting flaw. Dealloying in this case is believed to be similar to dealloying seen in other susceptible aluminum-bronze components. The process by which dealloying of aluminum-bronze occurs has been described in previous communications with the NRC" (letter dated November 1, 1988, ADAMS Legacy Accession No. 8811100009)

The licensee performed flaw evaluations based on the requirements of the ASME Code, Sections III and XI. The description of the licensee's flaw evaluation is discussed in Section 3.6 of this safety evaluation.

In its letter dated September 6, 2007, the licensee stated that structural integrity is monitored by: (a) monthly monitoring for qualitative assessment of leakage (quantitative if measurable leaks are observed), and (b) continuing periodic walkdowns of large-bore ECW piping. The walkdowns are regularly scheduled VT-2 examinations at 6-month intervals. The licensee stated that "These inspections have proven to be an effective means of identifying dealloyed/cracked components prior to deterioration of structural integrity margins below ASME Code, Section XI requirements." The licensee further stated that it will re-evaluate the structural integrity and the monitoring frequency "if significant changes in the condition of the dealloyed area are found during this monitoring." There is no measurable leakage at this time.

In its letter dated September 6, 2007, the licensee provided the following impracticality determination:

> As stated in Generic Letter 90-05, an ASME Code repair is required for Code Class 1, 2, and 3 piping unless specific written relief is granted by the NRC. Relief is appropriate when performing the repair at the time of discovery is determined to be impractical.

A repair is considered to be impractical if:

- The flaw detected during plant operation is in a section of Class 3 piping that cannot be isolated to complete a code repair within the time period permitted by the limiting condition for operation of the affected system as specified in the plant Technical Specifications, and (b)

- Performance of code repair necessitates a plant shutdown.

Performance of code repairs within the allowed outage time for the ECW system, as permitted by the limiting condition for operation, is not practical due to the amount of time required to implement the repair, and the potential for fit-up problems during repair. A plant shutdown may be necessary to complete the repair. Therefore, relief is requested on the basis of impracticality.

3.5 Duration of Proposed Alternative (As stated by the licensee)

Repair of the defect will be deferred until adequate time is available for the repair, but no later than the next Unit 2 refueling outage, provided the condition continues to meet the acceptance criteria of Generic Letter 90-05. The next Unit 2 refueling outage is currently scheduled to begin in October 2008.

3.6 NRC Staff Evaluation

On June 6, 2007, the licensee identified a flaw (an indication of dealloying) on flow balance throttle valve 2-EW-0204 in the SBDG #23 cooling return line of the ECW system during the periodic examination of ECW large-bore piping at STP, Unit 2. At the time, Unit 2 was in Mode 1 at 100 percent power. The licensee stated that "dealloying indication is a spot with residue buildup on the seat retainer. The area of deposit appears to be less than 3/4 inches in diameter and composed of porous, dealloyed pipe material. There is no active dripping." In its letter dated May 14, 2008, the licensee stated that "Dealloying previously occurred in a 6-inch Posi-Seal valve in 2000/2001. Incidents of apparent through-wall dealloying are not known to have previously occurred in Hills-McCanna valves at the South Texas Project."

3.6.1 Flaw Evaluation

As stated in its September 6, 2007, submittal, the licensee performed a flaw evaluation to assure that adequate margins remain for the structural integrity of partially dealloyed aluminum-bronze valve. The licensee calculated a combined pressure stress and membrane stress of 4912 pounds per square inch (psi), which is less than the allowable value of 7500 psi for dealloyed aluminum-bronze material. The licensee stated that "Under the combined stresses, the critical crack length for a 6-inch diameter schedule 40 pipe (0.28-inch wall thickness) is approximately 12 inches. This critical crack length is well above that of the dealloyed area (3/4 inches diameter). The calculated safety margins are adequate for the various loading conditions."

On February 12, 2008, the staff requested that the licensee provide detailed discussion regarding the methodology used in the flaw evaluation, particularly with regard to the methodology described in GL 90-05, including detailed quantitative information regarding the calculated safety margins for the various loading conditions. In its letter dated May 14, 2008, the licensee stated that "the methodology used in flaw evaluations is described in Section 5.0 of

ATPECH analysis document AES-C-1964-1, "Calculation of Critical Bending Stress for Dealloyed Aluminum-Bronze Castings in the ECW System." This was previously submitted to the NRC as an attachment to" the licensee's letter dated August 10, 2000 (ADAMS Accession No. ML003742174).

The licensee stated that "safety margins are determined from stresses on the affected region using postulated stresses due to pipe breaks as well as loads transferred from the pipe to the valve body." The licensee calculated postulated pipe break stresses using ASME Code, Section III, subsection ND-3652.2, equation 9, and subsection ND-3652.3, equation 10, for occasional loads and thermal expansion, respectively, and treated the seat retainer as a section of 6-inch diameter schedule 40 pipe. The licensee noted that "dealloying reduces material strength. However, the body of the valve is not degraded; therefore, safety margins for the valve are not reduced. The retaining ring evaluation is performed separately and accounts for the impact of reduced material strength."

The licensee calculated pipe-to-valve body loads according to ASME Code Section III, Subsection ND (for Class 3 piping) and determined safety margins by comparing the allowable moment to the calculated load and, again, noted that "although dealloying reduces the strength of the affected material, safety margins for the valve are not reduced because the body of the valve is not degraded."

Concerning the seat retainer design, the licensee stated:

> For evaluation purposes, the seat retainer is modeled as a 6-inch diameter schedule 40 pipe. The combined primary membrane stresses due to pressure plus bending loads are compared to the primary bending stress at incipient plastic collapse.
>
> The seat retainer is fabricated from SB 148 CA 954. Tensile strength and yield strength are listed as 86 ksi [kilopounds per square inch] and 36 ksi, respectively.
>
> Taking into account the circumferential bolt holes, the effective diameter of the retainer is 7.905 inches, with an effective thickness of 0.925 inch. The seat retainer has significant radial thickness available to resist pressure.

The licensee determined the pressure stress to be 640 psi, which is small compared to a dealloyed material allowable value of 7500 psi.

The licensee also stated that:

> Primary membrane stress due to bending is calculated from the resultant moment. Using square root of the sum of the squares (SRSS), the resultant moment is calculated from orthogonal faulted moment loads, which are those loads used in qualifying the flange in the pipe stress calculation. These loads are normal (thermal plus dead weight) plus seismic plus waterhammer combined as an absolute sum.

The licensee stated that "the code-allowable stress for aluminum-bronze is 18,700 ksi. Dealloyed aluminum-bronze has an allowed stress value of 7500 ksi." The NRC finds that the calculated combined primary membrane stress of 4912 psi due to pressure plus bending loads is within the allowable stress of 7500 ksi and, therefore, is acceptable.

The results of the licensee's flaw evaluation show that the degraded valve maintains substantial safety margins for the various loading conditions. Therefore, the flaw on the valve is not expected to grow to sizes large enough to cause a failure in a short period of time. Furthermore, cracks are expected to be detected well before they reach a size sufficient to result in failure. The staff finds the evaluation approach employed by the licensee is acceptable because the structural integrity analysis employs the methods specified in NRC GL 90-05. The results of the licensee's flaw evaluation show that there is reasonable assurance that the structural integrity of the degraded valve will be maintained.

3.6.2 Inspection Issues

In its letter dated May 14, 2008, the licensee indicated that walkdowns of ECW piping are normally performed at intervals of 6 months. In the event a flawed area is discovered, the licensee will perform augmented monthly inspections to detect changes in the size of the discolored area or leakage. The licensee stated that inspections will look for: (a) a change from residue buildup to active dripping, (b) new indications at a different area on the component, or, (c) a substantial change (about two times or more) in the area that appears to encompass the size of the original indication. The licensee stated that it will re-evaluate structural integrity and the monitoring frequency of the subject valve "if monitoring identifies significant changes in the condition of the dealloyed area."

In its May 14, 2008, letter, the licensee stated that "periodic monitoring and inspection by STPNOC provide confidence in the ability to detect changes in the leakage rate before leakage becomes a safety issue." The licensee stated that none of the inspections performed "has shown sufficient change from the time of discovery to warrant accelerated implementation of corrective measures."

The staff finds that the licensee has implemented augmented monthly inspections to detect changes in the size of the dealloyed area or leakage. In its September 6, 2007, submittal, the licensee provided regulatory commitments to:

- Perform monthly walkdowns of dealloying location to detect changes in size of the discolored area or leakage until a code repair is performed

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

The expected completion date of the commitment is November 28, 2008. The current leakage is not readily measurable and the licensee has implemented monthly inspections to detect changes in the size of the flaw or increase in leakage. Therefore, based on the above evaluation, the staff finds that the augmented inspection is acceptable.

3.6.3 Consequence Assessment

In its May 14, 2008, letter, the licensee provided a detailed discussion regarding its consequence assessment in addition to the discussion shown above. The licensee stated that:

> Flooding in a given area due to the ECW system is enveloped by worst case flow from an opening in a local pipe due to a "critical crack," with an area equivalent to a rectangle of

length one-half the pipe diameter and a width equal to one-half the pipe-wall thickness. This assessment is bounding for the condition under consideration.

Flooding analyses have been performed for specific regions of South Texas Project, taking into consideration the local worst case flood source and the potential impact on plant equipment. Flooding is addressed in Updated Final Safety Analysis Report, Appendix 9A.

Water in a diesel generator bay can be tolerated up to a maximum level of 4 inches above the floor. Should that level be reached, the affected diesel generator would be declared inoperable. Technical Specifications require three diesel generators to be operable in Modes 1-4 and two diesel generators to be operable in Modes 5 and 6. The Diesel Generator Building design precludes flooding in one bay from impacting the other two bays. Plant operators monitor the diesel sump levels for increases that could be indicative of ECW leakage.

The staff agrees with the licensee and finds that the licensee has performed a consequence assessment to demonstrate that should the degraded valve leak, flooding would not affect the safe operation of the plant.

3.6.4 Regulatory Issues

The licensee proposed its alternative based on impracticality pursuant to 10 CFR 50.55a(g)(5)(iii). However, the NRC staff believes that the appropriate basis for relief is hardship, pursuant to 10 CFR 50.55a(a)(3)(ii). The dealloying was detected in the middle of an operating cycle. The licensee contended that it is impractical to shut down the plant in mid-cycle to repair the valve because of the amount of time required to perform the repair. The licensee stated that the performance of a permanent ASME Code repair may necessitate a plant shutdown because the allowed outage time (7 days) specified by the limiting condition for operation for the ECW system may not be sufficient to complete the ASME Code repair. This time limitation is projected from the consideration that the amount of time that is needed to implement the Code repair may be longer than 7 days, when considering that there is a potential for fit-up problems and other unexpected situations which could delay the scheduled completion of the repair.

In its May 14, 2008, letter, the licensee stated that:

ASME Section XI, IWA-5250, requires that leakage be evaluated for corrective action and implies that any component with through-wall leakage must be repaired or replaced regardless of the leakage rate. The expectation of ASME Section XI is that through-wall leaks will be repaired at the time of discovery. Repairs of dealloyed section of piping require that the affected ECW loop be made inoperable. However, repairs can not be initiated immediately upon discovery of a flaw due to time required for obtaining parts, staging materials, and repair crew preparation, with the time for the actual repair beyond that. The amount of time needed for resolution will vary depending upon individual circumstances, but could require months from time of discovery.

As stated in the South Texas Project Technical Specifications, the three independent ECW loops shall be operable in modes 1, 2, 3, and 4. With only two of the ECW loops operable, all three are to be operable within seven days. If only one loop remains in

service, one loop is to be returned to service within one hour. If these requirements are not met, the affected unit is to be placed in Hot Standby within the next six hours, or the requirements of the Configuration Risk Management Program are to be applied.

The South Texas Project applies risk-managed Technical Specifications in accordance with the Configuration Risk Management Program. If there is a need to extend the allowed outage time for the affected ECW loop, risk analysis techniques can be applied that take into account real-time plant status to keep overall risk below 10E-5 up to a maximum of 30 days. However, taking an otherwise operable ECW loop out of service while at power not only increases overall risk to the plant, but also limits flexibility in dealing with other plant equipment issues that may arise in the interim.

The NRC staff believes that the proposed alternative should be evaluated under the hardship argument in lieu of impracticality. It is not impractical for the licensee to shut down the plant to repair the degraded valve. However, it is a hardship for the licensee to shut down the plant to perform the repair. The staff finds that requiring the licensee to immediately perform a permanent ASME Code repair would result in a hardship because plant shutdown and subsequent restart for the mid-cycle ASME Code repair would unnecessarily cycle plant systems and components. The unscheduled plant shutdown would result in a reduction of the safety margins in plant operation. The hardship incurred by the mid-cycle repair would not have a compensating increase in the level of safety because the licensee has demonstrated that the degraded valve has maintained structural integrity. Therefore, the staff finds that compliance with the specified Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

## 4.0 COMMITMENTS

In its letter dated September 6, 2007, the licensee provided the following commitments:

| Commitment | Expected Completion Date |
|---|---|
| Rework of the defect will be deferred until adequate time is available for the repair, but no later than the next Unit 2 refueling outage, 2RE13. | 11/26/2008 |
| Perform monthly walkdowns of dealloying location to detect changes in size of the discolored area or leakage until a code repair is performed.<br><br>Structural integrity and the monitoring frequency will be re-evaluated if significant changes in the condition of the dealloyed area are found during this monitoring. | 11/28/2008 |

## 5.0 CONCLUSION

Based on the review of the information provided by the licensee, the NRC staff concludes that the licensee has proposed an acceptable alternative to the requirements of ASME Code, Section XI, IWA-5250. Requiring an immediate ASME Code repair would result in a plant shutdown, creating a hardship for the licensee, without a compensating increase in the level of quality or safety. Furthermore, the NRC staff finds that the augmented inspection and flaw evaluation in the proposed alternative provide reasonable assurance of structural integrity during the interim period. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative of Relief Request RR-ENG-2-49 for STP, Unit 2, until completion of the next refueling outage, which is scheduled to begin in October 2008.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: J. Tsao

Date: September 26, 2008