Nuclear Operating Company

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

May 31, 2012
NOC-AE-12002865
10 CFR 54
STI: 33555840
File: G25

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Response to Requests for Additional Information (RAI) B2.1.9-1a for the
South Texas Project License Renewal Application (TAC Nos. ME4936 and ME4937)

References: 1. STPNOC letter dated October 25, 2010, from G. T. Powell to NRC Document Control Desk, "License Renewal Application" (NOC-AE-10002607) (ML103010257)
2. NRC letter dated February 28, 2012, "Requests for Additional Information for the Review of the South Texas Project, Units 1 and 2 License Renewal Application – Aging Management, Set 14 (TAC Nos. ME4936 and ME4937)" (ML12053A430)

By Reference 1, STP Nuclear Operating Company (STPNOC) submitted a License Renewal Application (LRA) for South Texas Project (STP) Units 1 and 2. By Reference 2, the NRC staff requests additional information for review of the STP LRA. STPNOC's response to the requests for additional information is provided in Enclosure 1 to this letter.

There are no regulatory commitments in this letter.

Should you have any questions regarding this letter, please contact either Arden Aldridge, STP License Renewal Project Lead, at (361) 972-8243 or Ken Taplett, STP License Renewal Project regulatory point-of-contact, at (361) 972-8416.

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

Executed on 5/31/2012
Date

D. W. Rencurrel
Chief Nuclear Officer

KJT

Enclosure: STPNOC Response to Requests for Additional Information

A147
NRR

cc:
(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
1600 East Lamar Boulevard
Arlington, Texas 76011-4511

Balwant K. Singal
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8B1)
11555 Rockville Pike
Rockville, MD 20852

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

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

John W. Daily
License Renewal Project Manager (Safety)
U.S. Nuclear Regulatory Commission
One White Flint North (MS O11-F1)
Washington, DC 20555-0001

Tam Tran
License Renewal Project Manager
(Environmental)
U. S. Nuclear Regulatory Commission
One White Flint North (MS O11F01)
Washington, DC 20555-0001

(electronic copy)

A. H. Gutterman, Esquire
Kathryn M. Sutton, Esquire
Morgan, Lewis & Bockius, LLP

John Ragan
Chris O'Hara
Jim von Suskil
NRG South Texas LP

Kevin Pollo
Richard Pena
City Public Service

Peter Nemeth
Crain Caton & James, P.C.

C. Mele
City of Austin

Richard A. Ratliff
Alice Rogers
Texas Department of State Health Services

Balwant K. Singal
John W. Daily
Tam Tran
U. S. Nuclear Regulatory Commission

STPNOC Response to Requests for Additional Information

SOUTH TEXAS PROJECT, UNITS 1 AND 2, REQUEST FOR ADDITIONAL INFORMATION AGING MANAGEMENT, SET 14 (TAC NOS. ME4936 AND ME4937)

Open Cycle Cooling Water System (021)

NRC RAI B2.1.9-1a

Background

Discussions with the applicant during the aging management program (AMP) Audit indicated that the inclusion of cracking as an aging effect managed by the Open-Cycle Cooling Water System program was an error. The staff issued RAI B2.1.9-1 to confirm this. In its response dated September 15, 2011, the applicant revised LRA Sections A1.9 and B2.1.9 to delete cracking as an aging effect in the Open-Cycle Cooling Water System program and stated no other sections of the LRA were identified that required revision for this error.

During its review of plant-specific operating experience, the staff noted that, in Licensee Event Reports (LERs) 499/2005-004 and 499/2010-001, cracking had apparently been identified in the heat affected zones for multiple welds in the aluminum bronze piping of the essential cooling water (ECW) system. Neither LER provided a cause of the crack initiation. The staff also noted that, as indicated in "Aluminum Bronze Alloys Corrosion Resistance Guide," Publication No. 80, Copper Development Association, 1981, a factor to consider in some grades of aluminum bronze is the formation of microfissures in the heat-affected zones during welding, which can act as stress raisers and increase the danger of stress corrosion cracking in subsequent service.

Issue

Based on the identification of cracking in plant-specific operating experience, which has apparently occurred in the heat-affected zones for multiple welds in aluminum bronze piping of the ECW system, it is unclear to the staff why cracking is not an aging effect that requires management for the associated material and environment combination.

Request

Provide an AMR line item and propose an AMP to manage cracking of the aluminum bronze piping exposed to raw water in the ECW system or provide the technical bases giving reasonable assurance that the ECW components will continue to meet their licensing basis during the period of extended operation without managing this aging effect.

STPNOC response:

In 2005, cracks were discovered in the piping inside the slip-on flange immediately downstream of the Component Cooling Water (CCW) Heater Exchanger 2A ECW Return Throttle Valve. The root cause analysis determined that the pipe wall had thinned due to cavitation erosion. The cracks were a secondary effect due to local flexing of the component wall resulting from wall thinning. Corrective actions included: (1) damaged components were replaced; (2) a design change was made to allow Belzona or equivalent product that is resistant to cavitation damage to be coated on the affected internal piping and component surfaces; and (3) preventive maintenance activities were developed to inspect the effectiveness of the coating. The secondary effect of cracking does not need to be managed by a separate aging management program because the primary cause of the failure, loss of material due to cavitation erosion, is already managed by the Open-Cycle Cooling Water System program (B2.1.9).

In 2009, a crack was found in the 30" CCW Heat Exchanger 2C ECW Return piping near a 1" vent valve. The crack area, including the crack initiation site, was destroyed in efforts to prepare the piping for repair. The crack propagated due to cyclic stresses from vibration of the 1" vent line. Although the root cause for the crack initiation could not be determined, the most likely cause was that a flaw, as a result of welding in the heat-affected zone, combined with cyclic stresses propagated the crack near the nipolet weld area of the vent line. The extent of condition was addressed as part of the corrective action program and the vent valves at the same location were removed from the remaining ECW trains in both units.

Loss of material is the aging effect for cracking experienced in the ECW system aluminum bronze components resulting from cavitation erosion or dealloying (see STPNOC letter NOC-AE-12002853 to the NRC dated May 31, 2012). Cracking resulting from fabrication flaws is not an aging effect. Loss of material of ECW system components is effectively managed by the Open-Cycle Cooling Water System program (B2.1.9) and the Selective Leaching of Aluminum Bronze program (B2.1.37). Applicable AMR line items from Table 3.3.2-4 of the LRA exist and are presented on the following page. Therefore, cracking of aluminum bronze components do not require a separate AMR line item.

Table 3.3.2-4 Auxiliary Systems – Summary of Aging Management Evaluation – Essential Cooling Water and ECW Screen Wash System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB, SIA	Copper Alloy (Aluminum > 8%)	Raw Water (Int)	Loss of material	Open-Cycle Cooling Water System (B2.1.9)	VII.C1-9	3.3.1.81	B
Piping	LBS, PB, SIA	Copper Alloy (Aluminum > 8%)	Raw Water (Int)	Loss of material	Selective Leaching of Aluminum Bronze (B2.1.37)	VII.C1-10	3.3.1.84	E, 3