



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 18, 2016

Mr. G.T. Powell  
Site Vice President  
STP Nuclear Operating Company  
P.O. Box 289  
Wadsworth, TX 77483

SUBJECT: PLAN FOR THE 2016 SELECTIVE LEACHING OF ALUMINUM-BRONZE  
AGING MANAGEMENT PROGRAM REGULATORY AUDIT REGARDING THE  
SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL  
APPLICATION REVIEW (TAC NOS. ME4936 AND ME4937)

Dear Mr. Powell:

By letter dated October 25, 2010, STP Nuclear Operating Company (STPNOC or the applicant) submitted an application for renewal of operating licenses NPF-76 and NPF-80 for South Texas Project (STP), Units 1 and 2. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants."

The staff plans to conduct a follow-up regulatory audit of your Selective Leaching of Aluminum Bronze aging management program and associated issues at your facility from March 21, 2016, to March 23, 2015, in accordance with the enclosed regulatory audit plan. The purpose of the audit is to gain an understanding of the applicant's aging management program for welds that are susceptible to aluminum bronze selective leaching such that the staff has confidence that Open Item 3.0.3.3.3-1 in the 2013 Safety Evaluation Report with Open Items (Agency Document and Access Management System (ADAMS) Accession No. ML13044A115) has a closure path.

If you have any questions, please contact me by telephone at 301-415-3306 or by e-mail at [lois.james@nrc.gov](mailto:lois.james@nrc.gov).

Sincerely,

*/RA/*

Lois M. James, Sr Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:  
As stated

March 18, 2016

Mr. G.T. Powell  
Site Vice President  
STP Nuclear Operating Company  
P.O. Box 289  
Wadsworth, TX 77483

SUBJECT: PLAN FOR THE 2016 SELECTIVE LEACHING OF ALUMINUM-BRONZE AGING MANAGEMENT PROGRAM REGULATORY AUDIT REGARDING THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION REVIEW (TAC NOS. ME4936 AND ME4937)

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Office of Nuclear Reactor Regulation

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Enclosure:  
As stated

cc w/encl: Listserv

**DISTRIBUTION:**  
See next page

**ADAMS Accession No.: ML16076A118**

**\*Concurred via email**

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<b>NAME</b>	YDiaz-Sanabria	LJames		
<b>DATE</b>	3/17/2016	3/18/2016		

**OFFICIAL RECORD COPY**

Letter to G.T. Powell from Lois M. James dated March 18, 2016

SUBJECT: PLAN FOR THE 2016 SELECTIVE LEACHING OF ALUMINUM-BRONZE  
AGING MANAGEMENT PROGRAM REGULATORY AUDIT REGARDING THE  
SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL  
APPLICATION REVIEW (TAC NOS. ME4936 AND ME4937)

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## **Audit Plan**

# **2016 Follow-up Audit on Selective Leaching of Aluminum-Bronze Aging Management Program for the South Texas Project, Units 1 and 2 License Renewal Application**

**March 21-23, 2016**

**Division of License Renewal  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission**

ENCLOSURE

## License Renewal Aging Management Program Audit Plan South Texas Project

### 1. Background

By letter dated October 25, 2010, STP Nuclear Operating Company (STPNOC or the applicant), submitted to the U.S. Nuclear Regulatory Commission (NRC or the staff) its application for renewal of operating license nos. NPF-76 and NPF-80 for South Texas Project (STP), Units 1 and 2, respectively. The applicant requested renewal of the operating licenses for an additional 20 years beyond the 40-year current license terms, which expire on August 20, 2027, for Unit 1 and December 15, 2028, for Unit 2. Staff from the Office of Nuclear Reactor Regulation, with technical support from staff in the Office of Nuclear Regulatory Research, will lead a follow-up regulatory audit to gain a better understanding of revisions to the applicant's Aluminum Bronze aging management program (AMP) as discussed during the January 27, 2016, public meeting (Agencywide Document Access and Management System (ADAMS) Accession No. ML16033A005). The audit will cover AMP B2.1.37, "Selective Leaching of Aluminum Bronze" (Aluminum Bronze AMP) and associated aging management reviews, bases, and documentation as applicable.

### 2. Regulatory Audit Bases

License renewal requirements are specified in Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." Guidance is provided in NUREG-1800, Revision 2, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR), dated December 2010, and in NUREG-1801, Revision 2, "Generic Aging Lessons Learned (GALL) Report," dated December 2010.

### 3. Regulatory Audit Scope and Methodology

The purpose of the audit is to gain an understanding of the applicant's AMP for welds that are susceptible to aluminum bronze selective leaching such that the staff has confidence that Open Item 3.0.3.3.3-1 in the 2013 Safety Evaluation Report with Open Items (SER) (Agency Document and Access Management System (ADAMS) Accession No. ML13044A115) has a closure path. This audit will focus on material information, material process information, microstructure information, and structural integrity evaluations regarding the welds that may be susceptible to selective leaching needed in order for the staff to complete its review. Results of this audit will be ultimately documented in the staff's SER.

During this audit, the staff will utilize the following Scope and Agenda as a guide. The staff may also examine the applicant's program basis documents and related references for this AMP, review background calculations and evaluations as needed, and interview applicant representatives to obtain additional clarification related to the AMP.

## SCOPE AND AGENDA

1. Entrance meeting, introduction of personnel, review overall purpose of audit.
2. Review basic weld material information to ensure that the staff understands what materials are involved in the review.
  - a. Alloys that the pipes, backing rings, and welds are fabricated from
  - b. Specifications that the alloys were produced/procured to
  - c. Certified Material Test Report and material certification data, to the extent that it is useful/available
3. Review welding process information to ensure that the staff understands the details of how the pipes were prepared prior to welding (e.g.; weld joint and edge preparation/configuration) and how the welds were performed.
  - a. Welding schedule and/or Welding Procedure Specification
  - b. Procedure Qualification Record sheets
  - c. Details of any postweld heat treatment of the welds
  - d. Postweld inspection results, to the extent they are useful/available
  - e. Applicable standards and specifications associated with the fabrication/inspection of the welds
  - f. Computer modeling of welding processes (finite element analysis)
4. Grouping of weld population by category (e.g., shop vs. field, weld fabricator, welding procedure, potential susceptibility, reworked), to the extent that is useful/available. Review historical and general information of how the dealloying events have evolved over time and if there is a difference in the populations (welds vs. casting).
  - a. Population size of potentially susceptible welds
  - b. Failure analysis reports and root cause evaluations for dealloyed welds
  - c. Number of occurrences of dealloyed components over time, broken into populations of casting and welds
  - d. Number of dealloyed welds that were accompanied by nonstandard/nontypical features (e.g., crack, pit, fabrication defect, fit up defect, weld defect, weld rework)
5. Review microstructure and material property information including the following:
  - a. Resolutions and experimental uncertainty of measurement techniques
  - b. References/sources of data used to substantiate positions (e.g., Phase diagrams, Time-temperature-transformation diagrams, continuous cooling transformation diagrams), as applicable
  - c. Key difference between the susceptible microstructure of the cast material and the weld material.

- d. Key variables/features of the weld material microstructure that impact its degree of susceptibility
  - e. Procedures associated with stereology and/or quantitative metallography being used to determine the special distribution or connectivity of phases, as applicable
  - f. Procedures used to correlate processing parameters, microstructure, and susceptibility (e.g., cooling rates, dilution of weld material), including computer modeling
6. Review plant-specific engineering documents that address the magnitude of emergency cooling water system loads (e.g., pressure, deadweight, seismic).
  7. Review configuration of buried piping components that supports the position that 360 degree circumferential through-wall cracks will not result in piping segment lateral offset.
  8. Review structural integrity evaluations of welds with postulated or actual flaws.
  9. Review configuration of buried piping components that supports the position that 360 degree circumferential through-wall cracks will not result in piping segment lateral offset.
  10. Discuss applicant's proposed changes to the AMP and updated Final Safety Analysis Report Supplement description.
  11. Establish acceptable criteria for parts of the evaluation that are not fully complete.
  12. Based on the results of the audit, resolve what information will need to be submitted on the docket subsequent to the audit.
  13. Exit meeting and wrap-up.

#### **4. Information and Other Material Necessary for the Regulatory Audit**

The project team will review the available information and supporting documentation, as well as the license renewal application (LRA) and other AMP-related basis documents, as appropriate. The project team needs at least one hard-copy set of the information requested in Section 3 above, and associated references and background materials needed to support the above audit topics, including but not limited to condition reports related to degradation of the aluminum bronze welds, documents on repair/replacement of the subject welds, flaw evaluation reports, and all other supporting background documentation such as calculations, engineering evaluations, 10 CFR 50.59 evaluations, and so on to be available in the team's work room.

#### **5. Special Requests**

The staff emphasizes that, for a successful outcome, the applicant should make every effort to have available at the audit site: (a) copies of relevant materials; (b) management; and (c) technical personnel with expertise in site aluminum bronze issues.

#### **6. Team Assignments**

NRC Staff participation is projected as follows (some deletions, additions or substitutions may occur on an as-needed basis). Site access is requested; however unescorted access is not expected to be necessary as long as the meeting place is outside of the protected area fence.

<b>Area of Review</b>	<b>Assigned Auditor</b>
Project Manager	Lois M. James
Technical Lead	William Holston
Technical Reviewer	Margaret Audrain
Technical Reviewer	Christopher Hovanec
Technical Reviewer	Matthew Homiack

## **7. Logistics**

The audit will be conducted on location at the STPNOC site, with rooms and space to be supplied by STPNOC.

Work space and team support logistics:

- Audit timeframe: 7:00 AM – 6:00 PM.
- One general team work area with seating and laptop space for up to five people.
- One or more break-out rooms for question/answer/small group sessions and meetings, so that work in the main room is not disrupted.
- Telephone access for outside business-related calls. The break-out rooms should also have speaker phone capability for conference calls. External internet access as applicable.
- Internet access if possible (external only, no access needed to applicant's site/business internets)
- Access to printers for printing out files, drafts, draft requests for additional information (RAIs), review comments, schedules, and so on.
- Access to a copier for making duplicates for team use, meeting agendas.
- Lunch arrangement-information is requested; staff members normally pay for any lunches or meals in accordance with NRC policies.

## **8. Deliverables**

RAI(s) may be issued as deemed necessary by the staff.

An audit summary report will be issued to the applicant, normally within 90 days from the end of the audit. Final evaluation of the Aluminum Bronze AMP as applied to the pipe-to-pipe welds and related issues will be presented in the staff's SER for the STP LRA.