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

May 28, 2015

Mr. G. T. Powell, Vice President
Technical Support and Oversight
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION – SET 31 (TAC NOS. ME4936 AND ME4937)

Dear Mr. Powell:

By letter dated October 25, 2010, STP Nuclear Operating Company submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew operating licenses NPF-76 and NPF-80 for South Texas Project, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC) staff. The NRC staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

This request for additional information has been presented to Mr. Arden Aldridge of your staff, and we request your response within 60 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-3873 or by e-mail at john.daily@nrc.gov.

Sincerely,

/RA/

John W. Daily, Senior Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:
As stated

cc: Listserv

May 28, 2015

Mr. G. T. Powell, Vice President
Technical Support and Oversight
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION – SET 31 (TAC NOS. ME4936 AND ME4937)

Dear Mr. Powell:

By letter dated October 25, 2010, STP Nuclear Operating Company submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew operating licenses NPF-76 and NPF-80 for South Texas Project, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC) staff. The NRC staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

This request for additional information has been presented to Mr. Arden Aldridge of your staff, and we request your response within 60 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-3873 or by e-mail at john.daily@nrc.gov.

Sincerely,

/RA/

John W. Daily, Senior Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:
As stated

cc: Listserv

DISTRIBUTION:
See next page

ADAMS Accession No. ML15131A272 *concurrence via email

OFFICE	LA: DLR/RPB1	PM: DLR/RPB1	BC: DLR/RPB1	PM: DLR/RPB1
NAME	*YEdmonds	JDaily	YDiaz-Sanabria	JDaily
DATE	5/20/15	5/27/15	5/28/15	5/28/15

OFFICIAL RECORD COPY

SOUTH TEXAS PROJECT, UNITS 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION - SET 31
(TAC NOS. ME4936 AND ME4937)

RAI B.2.1.37-6-1, Monitoring and Trending, and Acceptance Criteria AMP Elements

Background

As amended by letter dated July 31, 2014, the "monitoring and trending" Aging Management Program (AMP) element of the Selective Leaching of Aluminum Bronze Program states that the degree of dealloying and cracking, ultimate strength, yield strength, and/or fracture toughness will be trended throughout the period of extended operation. The "acceptance criteria" program element of the Selective Leaching of Aluminum Bronze Program states an acceptance criterion for ASME Code structural factors, ultimate tensile strength, yield strength, and as-received fracture toughness. The following documents illustrate the use of various input parameters:

- AES-C-1964-1, "Calculation of Critical Bending Stress for Dealloyed Aluminum-Bronze Castings in the ECW System," uses as-received material properties (i.e., ultimate strength, yield strength, fracture toughness) to establish critical bending stresses for select sizes of piping.
- RC 9890, "Stress Summary for Large Bore ECW Piping (2-1/2-inch and above)," uses a 100 percent dealloyed ultimate strength to demonstrate that ASME Code components have adequate structural integrity.
- AES-C-1964-5, "Evaluation of the Significance of Dealloying and Subsurface Cracks on Flaw Evaluation Method," uses the percent average internal dealloying and 100 percent dealloyed ultimate strength and yield strength to conclude that average dealloying up to 60 percent through-wall, accompanied by a crack within a region of through-wall dealloying, will meet allowable stress limits. It also includes a correlation between the observed outside flaw length to project the average dealloyed angle in order to demonstrate that structural integrity is met when a through-wall leak is detected.

Issue

It is not clear to the staff that the currently proposed parameters to be monitored and trended are adequate because the percent of average internal dealloying and flaw size correlation are critical parameters used in AES-C-1964-1 and AES-C-1964-5 to demonstrate structural integrity when a through-wall leak is detected and they are not included in the list of parameters to be trended. It is not clear as to whether 100 percent dealloyed material properties used in these calculations will be monitored and trended because the program uses the term "and/or" for trending these parameters. In addition, it is not clear as to why there are no acceptance criteria for percent average dealloying and verification of the flaw size correlation to Figure 4-1 of AES-C-1964-5.

ENCLOSURE

Request

1. State the basis for not monitoring and trending the percent of average internal dealloying and data related to the flaw size correlation in Figure 4-1 of AES-C-1964-5. In addition, state whether 100 percent dealloyed material properties will be monitored and trended.

2. In light of the use of the term “and/or,” provide justification as to why there are no acceptance criteria for percent average dealloying and verification of the flaw size correlation in Figure 4-1 of AES-C-1964-5.

3. If a 100 percent dealloyed or other parameter that should be monitored and trended or have an acceptance criterion because it has been used as an input value (except as-received values) in analyses used to demonstrate structural integrity is not addressed in the above two requests, state the parameter and whether it will be monitored and trended and its acceptance criterion.

RAI B.2.1.37-6-2, Percent Average Dealloying Inspection Results

Background

The staff reviewed several reports that show average dealloying values that exceed the 60 percent input used in AES-C-1964-5 during the audit in March of 2015. These values range from approximately 64 to 74 percent, as documented in report numbers MT-3383, “Investigation of Leaks in Aluminum Bronze Flange from South Texas Project to Determine Extent of Dealloying,” MT-4907, “Mapping of Dealloying in Aluminum Bronze Pipe to Flange Weld Bend Test,” MT-3047-2, “Investigation of Dealloying in 6-Inch Aluminum Bronze Flange and Cracking of this Flange welded to Wrought Pipe at South Texas Project Unit 1,” and MT-3923, “Evaluation of [6-inch] Aluminum Bronze Flange from South Texas Project Unit 2 Essential Cooling Water System.”

Issue

The staff cannot conclude that the applicant’s existing structural integrity calculations remain valid when some inspections have revealed average dealloying values that exceed the 60 percent value used in the current analysis.

Request

Explain how structural integrity is demonstrated when inspections have revealed average dealloying values that exceed 60 percent.

RAI B.2.1.37-6-3, Inspection Results Demonstrating the Acceptability of the Flaw Size Correlation

Background

Figure 4-1 of AES-C-1964-5 contains a flaw-sizing curve which is used to relate the size of an indication found on the outside surface of a pipe to the amount of dealloying that has occurred on the inside of the pipe. This figure is based on data gathered in the 1990's from examinations of dealloyed pipes with through-wall cracks. During the audit the staff reviewed AES 13078445-2Q1, "Structural Testing of 3-inch, 8-inch and 10-inch Aluminum Bronze Flanges Removed from the Essential Cooling Water System." The staff independently confirmed that for the 10-inch flange, this test provides one more data point that supports the flaw size correlation.

Issue

During the audit, the staff found that other piping specimens that exhibited dealloying and through-wall cracks have since been tested; however, the new examination data from these tests has not been used to update or justify the continued use of Figure 4-1 of AES-C-1964-5.

Request

Plot the data for all of the more-recent tests of dealloyed specimens with through-wall cracks onto Figure 4-1 of AES-C-1964-5. Justify the continued use of this figure if the new data points fall outside the existing relationship established between crack angle and dealloying angle. Provide a list of all the data points referenced to their source document.

RAI B.2.1.37-6-4, Substantiation of 100 Percent Dealloyed Tensile Specimens

Background

Page 12 of Enclosure 1, dated July 31, 2014, states that the dimensional degree of dealloying for mechanical test specimens is determined by an optical analysis that digitalizes an image of the fractured surface. The digital image distinguishes between the as-received and dealloyed material conditions based on the appearance of the fractured surface and the ratios of the areas to calculate the percent of dimensional dealloying for mechanical test specimens. The inherent assumption in this analysis is that, on an engineering scale, the alloys susceptible to selective leaching only exist in two discrete conditions: (1) the as-received condition and (2) fully dealloyed. This same assumption, that the susceptible alloys only exist in two discrete conditions, was reinforced in discussions with plant and consultant staff during the supplemental audit of the Selective Leaching of Aluminum Bronze Program in March of 2015. This optical analysis method was used to determine the percent dealloyed for all the mechanical test data presented in Enclosure 1 of letter dated July 31, 2014, including the 100 percent dealloyed properties. The 100 percent dealloyed properties were then used in structural integrity calculations.

Page 14 of Enclosure 1, dated July 31, 2014, states that some mechanical test specimens were selected and elemental analysis was performed on the fractured surfaces. Qualitative elemental measurement, for Al, Fe, and Cu, were taken in a manner that traversed the fractured surface spanning areas of both as-received and dealloyed material. An example of one of those traverses taken on a fracture toughness specimen was provided on page 14 of Enclosure 1. The traverse shows a region of the fractured surface with a chemistry representative of as-received material and a region with reduced level of aluminum and iron.

Issue

The staff has not been provided with a technical basis to substantiate the assumption that alloys susceptible to selective leaching only exist in two discrete conditions. The staff cannot conclude that the susceptible material only exists in two discrete conditions or that the dealloying process has gone to completion in a region of reduced aluminum/iron based on a single traverse taken on a single specimen. The staff recognizes that material in the fully dealloyed condition will still have measureable amounts of aluminum and iron because not all of the phases present in the alloys are affected by the dealloying process. It is unclear to the staff if conclusions being drawn from Energy Dispersive Spectroscopy (EDS) traverses in dealloyed regions are based on elemental levels, degree of stability of the composition over a given length, or some other factor.

In addition, the elemental composition of the 100 percent dimensionally dealloyed tensile specimen (10x10x6 tee, piece number 3, Alloy CA952) has not been evaluated to determine if the dealloying process has gone to completion. This tensile specimen was used to produce the only yield strength value for 100 percent dimensionally dealloyed material measured to date, as shown in the plots on page 6 of Enclosure 1.

Request

1. Provide the technical basis used to substantiate the assumption that the alloys (C95400 and C95200) susceptible to selective leaching only exist in two discrete conditions; the as-received condition and fully dealloyed. Provide the technical references and experimental data used to support the technical basis, as applicable.

2. Demonstrate that the dealloying process has gone to completion in the tensile specimen (10x10x6 tee, piece number 3, Alloy CA952) used to produce the 100 percent dimensionally dealloyed yield strength value plotted on page 6 of Enclosure 1.

3. Provide, in tabular form, all the specimens that were tested in the 100 percent dealloyed condition. Provide a short description to identify each specimen including the component it was extracted from and alloy. Provide the mechanical properties that were measured from conducting the test. Provide the method used to establish that the specimen was 100 percent dealloyed. If neither the optical method discussed above nor direct elemental evaluation was used to establish that the test specimen was 100 percent dealloyed, provide a justification to substantiate the condition of the material.

RAI B.2.1.37-6-5, Strength vs. Percent Dealloyed Curves

Background

The staff has reviewed publically available tensile yield strength and ultimate tensile strength values for aluminum bronze alloys C95200 and C95400 [references 1-7, listed below]. The results of the staff's review are shown below in Table 1.

Table 1: Publically available strength data for alloys C95200 and C95400

	Minimum Values		Typical Values	
Alloy	Yield (Ksi)	Tensile (Ksi)	Yield (Ksi)	Tensile (Ksi)
C95200	25	65	27	80
C95400	30	75	35	85

The tensile yield strength and ultimate tensile strength values for the C95200 and C95400 alloys tested by STP are provided in RAI Response Set 26, Enclosure 1, dated July 31, 2014. The strength values are plotted on pages 5 and 6 of Enclosure 1. The yield strength values are plotted using both the standard 0.2 percent offset method and the 0.5 percent Extension-Under-Load (EUL) method.

A regression analysis of the strength data has been performed on each plot. The staff's estimate of the STP values plotted on pages 5 and 6 of the Enclosure are shown in Table 2 below.

Table 2: Estimate of strength values plotted on pages 5 & 6 of Enclosure 1, dated July 31, 2014

Alloy	Percent Dealloyed	Minimum Values		Typical Values	
		Yield (Ksi)	Tensile (Ksi)	Yield (Ksi)	Tensile (Ksi)
C95200	0%	~32	~65	---**	---**
	100%	~28	~29	---**	---**
C95400	0%	~26	~73	~35	~80
	100%	---**	~29	---**	---**
C954/2*	0%	~26	~65	~35	~80
	100%	~28	~29	---**	---**

* C954/2 denotes treating the C95200 and 95400 data sets as a single data set.
** Insufficient quantity of data for the staff to estimate a value.

The staff has made the following three observations based on their review of Tables 1 and 2:

- The range of strength values of the aluminum bronze alloys at STP are representative of the range of strength values expected from a sampling of the commercial industry for alloys C95200 and C95400. The STP values span the expected minimum to maximum range with the typical values being comparable to those reported by others.

- As-received (0 percent dealloyed) yield strength values bound the dealloyed yield strength values reported by STP. The lowest as-received yield strength value reported by STP is for alloy C95400 which is the stronger of the two alloys.

- Approximate decrease in ultimate tensile strength is 60 percent while the approximate decrease in tensile yield strength does not appear to be measureable.

References:

[1] ASME BPVC, Section IIB-2013, SB-148, Table 3

[2] ASTM B148-14, Standard Specification for Aluminum-Bronze Sand Castings

[3] ASTM B763/B763M-14, Standard Specification for Copper Alloy Sand Castings for Valve Applications

[4] QQ-C-390B, Federal Specification for Copper Alloys Castings

[5] Material Data Sheets at http://www.eriebronze.com/alloys/accessed on April 10, 2015

[6] Material Data Sheets at http://www.spba.net/accessed on April 10, 2015

[7] Copper Development Association Inc. at http://www.copper.org/resources/properties accessed on April 10, 2015

Issue:

(1) The plots on pages 5 and 6 of Enclosure 1 have multiple data sets for alloys C95200 and C95400. Each plot also has a single regression curve plotted. It is unclear to the staff if the data within each plot is being treated as a single data set or multiple data sets when determining strength values as a function of percent dealloying.

(2) It appears that linear regression analysis was used to determine the relationship between yield strength and percent dealloying while a nonlinear regression analysis was used to determine the relationship between ultimate tensile strength and percent dealloying. It is unclear to the staff why different types of regression analysis were used for the different data sets. The R-squared value for the curves has not been provided. It is also unclear to the staff if each data point is weighted equally in the analysis.

`

(3) It is unclear to the staff why the yield strength is being determined by both the 0.2 percent offset and the 0.5 percent EUL methods for all alloys and material

conditions. It is also unclear if the values determined by the two different methods are being used for two different purposes. Depending on what the yield strength values are being used for, the appropriateness of determining the tensile yield strength using the 0.5 percent EUL method is uncertain.

(4) Tensile testing of material in the zero percent dealloyed condition has produced lower yield strength values than the material tested in the 100 percent dealloyed condition. Also, material tested in the less than 10 percent dealloyed condition produced comparable yield strength values as the material tested in the 100 percent dealloyed condition. Given the degree of scatter and statistical uncertainty in the yield strength values plotted on page 6 of Enclosure 1, it is not clear to the staff that the single yield strength data point for the 100 percent dealloyed material bounds the lower limit which could exist for the susceptible components in operation.

Request:

Respond to the following requests to the extent applicable to the aging management, structural integrity, and operability of aluminum-bronze components. If the data is not being used to support these activities, state that it is not applicable and no further discussion is needed.

(1) Clarify if the data sets, within each plot on pages 5 and 6 of Enclosure 1, are being treated as a single data set or multiple data sets when determining strength values as a function of percent dealloying. If the data sets within each plot are treated as a single data set, state and justify how this ensures that the strength values are conservatively bounded given that: (a) there are values for two different alloys; (b) the data sets are comprised of more C95400 data points than the lower strength C95200 alloy; and (c) the only material condition where values are available for both alloys is the as-received condition.

(2) State and justify the basis for the type of regression analysis used to determine the relationship between strength and percent dealloying for each plot on pages 5 and 6 of Enclosure 1, addressing why different types were used. Clarify if any data points were excluded or weighed unequally in the analysis. Provide the R-squared value for each fit on pages 5 and 6 in Enclosure 1.

(3) Clarify if and how the different yield strength values, determined by the 0.2 percent offset method and the 0.5 percent EUL method, are being used. If the 0.5 percent EUL yield strength values are being used for structural integrity, provide and justify the ductility criteria used to establish when this method will be used. Provide the lowest percent elongation value measured for C95200 and C95400, at any level of dealloying. If the 0.5 percent EUL yield strength values are being used for structural integrity calculations to support operability evaluations state and justify the basis for using this method.

(4) Provide the lowest yield strength and ultimate tensile strength values measured to date, at any level of dealloying. Clarify what numerical yield strength value is being used for the 100 percent dealloyed material in the structural integrity calculations to support

operability evaluations. State and justify the basis used to conclude that the 100 percent dealloyed yield strength value being used for the structural integrity calculations to support operability evaluations is bounding for the susceptible components in operation.

RAI B.2.1.37-6-6, AMP Acceptance Criteria for Strength

Background

The "acceptance criteria" program element of the Selective Leaching of Aluminum Bronze Program states that 30 ksi is the acceptance criteria for both ultimate tensile strength and yield strength. RAI Response Set 26, dated July 31, 2014, has three strength vs. percent dealloyed plots on pages 5 and 6 of Enclosure 1. The three plots all have strength values below 30 ksi.

Issue

It is unclear to the staff how acceptance criteria of 30 ksi can be established for ultimate tensile strength and yield strength properties when current plant-specific data shows values below the acceptance criteria.

Request

State the basis and justify how the 30 ksi acceptance criteria can be established for ultimate tensile strength and yield strength properties when current test data shows values below the acceptance criteria. If 30 ksi is not the appropriate acceptance criteria for yield strength and ultimate tensile strength, state the revised acceptance criteria and basis used to establish the values. If the acceptance criterion for yield strength or ultimate tensile strength is revised, provide a summary of the results of each structural integrity calculation to reflect lower acceptance criteria.

RAI B.2.1.37-6-7, Basis for Use of the Average Dealloying Angle in Structural Integrity Analyses

Background

The response to RAI B.2.1.37-5, part f, dated July 31, 2014, cites Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," and ASME Code Section XI, Appendix H, "Evaluation of Procedures for Flaws in Piping Based on Use of a Failure Analysis Diagram," as the basis for use of the average through-wall dealloying angle instead of the inside wall dimension in AES-C-1964-5.

Issue

The staff cannot conclude that ASME Code Section XI, Appendix H (a methodology used to evaluate partial through-wall indications) provides a basis for use of an average through-wall dealloying angle because it lacks specificity to demonstrate acceptance of an average flaw size. Generic Letter 90-05 cites a flaw length, 2a, which is based on the dimensions of the flaw at the minimum pipe wall thickness. However, Generic Letter 90-05 is based on a process where the flaw can be characterized by volumetric measurements. In the case of selective leaching of castings, it is unlikely that volumetric characterization of the flaw would be possible, and if it were possible, the flaw-sizing correlation from Figure 4-1 of AES-C-1964-5 would not be necessary. A sufficient basis for use of the average dealloying angle has not been provided.

Request

State and justify the basis for use of an average through-wall dealloying angle as the output of the flaw-sizing correlation in Figure 4-1 of AES-C-1964-5.

RAI B.2.1.37-6-8, Implementing Procedures Related to System Walkdowns and Design Verification of As-Found Conditions

Background

During the supplemental audit of the Selective Leaching of Aluminum Bronze Program the staff reviewed PMWO SEM-1-9100041 and PMWO SEM-2-9100045, "ECW and ECW Screen Wash System – Visual Inspection System Piping."

UFSAR Appendix 9A states:

> Leaks that are detected are treated as non-conforming to the ASME Code, Section XI, i.e., as temporary non-code conditions in accordance with Generic Letter 90-05. Relief Requests are submitted to the NRC for such leaks (except for repairs in accordance with Code completed during LCO conditions, or leaks detected and repaired during an outage, or leaks in lines 1 inch or under which are exempt from ASME Code Section XI replacement rules).

During the supplemental audit, the staff reviewed 0PGP04-ZA-0148, "Aluminum Bronze Dealloying Management Program." Section 5.5.1, "Relief Request," states that based on the use of Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," components with flaws a short distance from the weld do not require a relief request. The staff also reviewed the 50.59 screen, 33915401, dated May 22, 2014, performed for this procedure change.

During the supplemental audit, the staff reviewed calculation 14-EW-003, "Flood and Leak Rate Analysis for a Circumferential Crack in Aboveground ECW Piping," dated March 11, 2014. This calculation supports the closure of Commitment No. 46 which states, "[le]ak rates that could occur upstream of any individual component supplied by the ECW system will be determined to validate the maximum size flaw for which piping can still perform its intended function." The calculation yielded results of crack sizes that would limit the leakage rate to below administrative limits ranging from 7.9 inches for 30-inch components to 6.0 inches for 3-inch components.

Issue

1. Based on its review of PMWO SEM-1-9100041 and PMWO SEM-2-9100045 and an interview with a system engineer who has conducted system walk downs to detect potential leaking susceptible aluminum bronze components, it is not clear that all susceptible components are listed in the PMWO.

2. The staff cannot conclude that the change to 0PGP04-ZA-0148 to allow the use of ASME Code Section XI Code Case N513-3 is acceptable. Code Case N-513-3, states, "[t]he flaw geometry shall be characterized by volumetric inspection methods or by physical measurement. The full pipe circumference at the flaw location shall be inspected to characterize the length and depth of all flaws in the pipe section." In most if not all cases, the internal flaw size cannot be characterized by volumetric or physical measurements.

3. It is not clear to the staff that the range of crack sizes that would limit the leakage rate to below administrative limits have been determined to be less restrictive than allowable flaw sizes that are determined meet structural integrity using AES-C-1964-1. In addition, 0PGP04-ZA-0148 has not been updated to reflect this potential further limit on allowable flaw size.

<u>Request</u>

1. State whether all susceptible components or description of components are listed in PMWO SEM-1-9100041 and PMWO SEM-2-9100045. If not, explain why all of the susceptible components are not identified in these inspection tasks.

2. State and justify the basis for use of Code Case N-513-3 to determine the acceptability of components exhibiting through-wall flaws.

3. State whether there are any flaw sizes that would be acceptable from a structural integrity basis but not acceptable to ensure that the leakage rate from a degraded component is below administrative limits. If this is the case, state how the leakage rate flaw size acceptance criteria will be incorporated into the program.

RAI B.2.1.37-6-9, Scope Expansion Criteria

<u>Background</u>

RAI B.2.1.37-5 Request (e), dated December 18, 2012, postulates a series of six degraded conditions and requests the specific actions to be taken in response to these conditions and the basis for those actions. The response includes a series of decision trees and extent of condition testing that would be conducted based on the severity of the degraded condition.

The staff reviewed the RAI response presented in RAI Response Set 26 dated July 31, 2014, and discussed the examples with station staff during the supplemental audit of the Selective Leaching of Aluminum Bronze Program. The staff recognizes that in several of the scenarios, the severity of the degraded condition will not be known until the degraded component has been replaced and subjected to subsequent profile examinations and analysis confirmation testing. In that case, the specific nonconforming component will no longer be in service. However, the purpose of extent of condition testing is to determine whether there are any other components in the system that are in an equally degraded condition. For example Generic Letter 90-05 contains recommendations for augmented inspections.

The staff concluded that differentiating the number of extent of condition tests depending on the severity of the degraded condition is a good practice. For example, discovery of a component that is inoperable either based on the size of the outside diameter evidence of through-wall leakage or as a result of follow-on testing should result in a larger extent of condition population than discovering that some aspect of the analytical methodology used to demonstrate structural integrity is not bounded, but the components can be demonstrated to be operable after revising the calculations.

Issue

With respect to the “corrective actions” program element, SRP-LR Section A.1.2.3.7 states that actions to be taken when the acceptance criteria are not met should be described in appropriate detail or referenced to source documents. However, the “corrective actions” program element of the Selective Leaching of Aluminum Bronze Program does not describe the extent of condition testing that will be conducted when degraded components are detected.

Request

State how the number of additional PEs and/or ACTs that will be conducted (beyond those stated in the “detection of aging effects” program element) when indications of through-wall leakage are discovered in susceptible aluminum bronze components will be addressed in the Selective Leaching of Aluminum Bronze Program and licensing basis.

RAI B.2.1.37-6-10, Clarification of Licensing Basis Related to Use of Partially Dealloyed Material Properties

Background

Pages 5 through 7 of Enclosure 1 of RAI Response Set 26 dated July 31, 2014, show material property data for ultimate tensile strength, yield strength, and fracture toughness for various amounts of dimensional dealloying.

Issue

As a result of the staff’s review of these plots and interviews with the applicant’s personnel, the staff lacks sufficient information to validate the accuracy of the partially dealloyed mechanical properties. The staff notes that no partially dealloyed material properties have been used in the calculations that support the technical basis for the Selective Leaching of Aluminum Bronze Program, including AES-C-1964-5 and RC 9890. However, it is not clear whether partially dealloyed material properties might be used in the future.

If partially dealloyed materials were to be used the staff will require additional information to determine the validity of partially dimensionally dealloyed toughness values and the statistical significance of the partially dimensionally dealloyed strength values if they will be used to demonstrate structural integrity.

Request

Clarify whether partially dimensionally dealloyed mechanical properties (i.e., ultimate tensile strength, yield strength, and fracture toughness) will be used during the period of extended operation to demonstrate the structural integrity of aluminum-bronze components. If partially dealloyed material properties will not be used during the period of extended operation, state how this will be addressed in the licensing basis.

Letter to G. Powell from J. Daily dated May 28, 2015

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION – SET 31 (TAC NOS. ME4936 AND ME4937)

DISTRIBUTION:

E-MAIL:
PUBLIC
RidsNrrDlr Resource
RidsNrrDlrRpb1 Resource
RidsNrrDlrRpb2 Resource
RidsNrrPMSTP Resource
RidsOgcMailCenter

JDaily
TTran
DMcIntyre, OPA
LRegner, DORL
WWalker, RIV
JDixon, RIV
BTharakan, RIV
WMaier, RIV
VDricks, RIV
NOKeefe, RIV
AVegel, RIV
GPick, RIV