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

February 28, 2012

Mr. D. W. Rencurrel
Sr. Vice President, Technical
Support and Oversight
STP Nuclear Operating Company
P.O. Box 289
Wadsworth, TX 77483

SUBJECT: 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)

Dear Mr. Rencurrel:

By letter dated October 25, 2010, STP Nuclear Operating Company (STPNOC or the applicant) 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 or the staff). The 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.

These requests for additional information were discussed with Arden Aldridge, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-3873 or by e-mail at john.daily@nrc.gov.

Sincerely,

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 w/encl: Listserv

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)

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 license renewal application (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 aging management review (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.

RAI B2.1.9-2a

Background
RAI B2.1.9-2 addressed plant-specific operating experience at STP which resulted in managing the loss of material due to cavitation erosion in the ECW system. The applicant's response to RAI B2.1.9-2 stated that erosion/corrosion is being managed by the Open-Cycle Cooling Water System program; however, it did not address the individual program elements affected by this enhancement to the AMP. Although certain aspects of the affected program elements may be

inferred from the response, the staff is not certain which program elements the applicant considers as being affected and in what specific manner.

With respect to extent of condition reviews performed for components in other systems, the response to RAI B2.1.9-2 stated "[l]ocations in other systems were not evaluated [for erosion corrosion] because the unique material/environment combination of the ECW system is not found in the other systems and erosion has not been found in other systems." The staff noted that loss of material from cavitation erosion can occur in many different environments for many different materials. The staff also noted that, in its response to RAI 3.4.2.6-1, the applicant stated that it had identified six systems subject to wall thinning due to erosion-corrosion that are being managed by the Flow-Accelerated Corrosion program, and it was not clear to the staff what distinction was being drawn by the applicant for the term erosion corrosion between the two RAI responses.

Issue
The applicant is managing loss of material due to cavitation erosion through the Open-Cycle Cooling Water System program, but did not provide information in the response to RAI B2.1.9-2 as to which specific program elements are affected by this enhancement and in what specific manner. In addition, the applicant appears to be using different definitions of the term erosion corrosion in its responses to RAI B2.1.9-2 and RAI 3.4.2.6-1.

Request
Describe the specific enhancement to the Open-Cycle Cooling Water System program, including the program elements affected, that has been implemented as a result of the loss of material identified in plant-specific operating experience discussed above. Also, clarify why the response to RAI B2.1.9-2 stated that erosion has not been found in other systems, when erosion was identified in six systems in the response to RAI 3.4.2.6-1.

RAI B2.1.9-3a

Background
RAI B2.1.9-3 addressed the potential problem associated with reduction in heat transfer in the ECW system caused by the degradation of the coatings used to mitigate loss of material. The RAI asked for information to show that the size and amount of debris, which could result from protective coating failures, will not affect intended function of the downstream components.

The response to RAI B2.1.9-3 stated that inspections of protective coatings are conducted during general system inspections and during various preventive maintenance activities. The response also stated that the heat exchangers cooled by ECW are either periodically performance tested or are periodically inspected and cleaned if required. The response discussed instances where material from degraded coatings had been found in several ECW heat exchangers, but stated no sheeting-type coating failures had been observed. The response noted these coating failures had no impact on the heat exchangers' performance and concluded by stating that continued implementation of the Open-Cycle Cooling Water System program and the tracking of plant operating experience provides reasonable assurance that any fouling caused by protective coating failures will be adequately managed.

Issue
Although STP has not experienced sheeting-type coating failures, on multiple occasions the coating failures have resulted in material of sufficient size to block various heat exchanger tubes. While these occasions to date have not adversely affected the intended functions of downstream components, these situations appear to be related to the amount of debris resulting from coating breakdowns as opposed to the inability of the debris from coating breakdowns to affect the intended function.

Request
Provide past corrective actions that have either resulted in enhancements to the Open-Cycle Cooling Water System program or have resulted in changes to the coatings used in the ECW system to support the conclusion that the effects of aging will be adequately managed to maintain intended functions of downstream components.

RAI B2.1.9-4a

Background
RAI B2.1.9-4 asked for the technical bases to show that, without protective coatings, the loss of material due to worst case cavitation erosion will be adequately managed. The staff noted that the AMP basis document stated that coatings are not credited in aging management to protect metal surfaces. The response to RAI B2.1.9-4 states that it is acceptable if coatings erode away between inspections because the piping inspections ensure that the piping is repaired or replaced before it reaches the minimum allowable wall thickness. The response also stated that the wear rate is calculated from the measurement of wear and the previous inspection results, which is then used with conservatisms to calculate the lifetime of the component.

Issue
Since the applicant states that it is acceptable for coatings to erode away between inspections, it is not clear to the staff how the lifetime of the component can be calculated because the amount of time that the coating has protected the component appears to be unknown. As a result, the staff would expect that the "conservatism" noted above in the applicant's response would assume the worst case loss of material which could occur between inspections without any coating. The applicant did not define the conservatisms used to calculate the lifetime of the component and how those conservatisms were established.

Request
For each location where coatings are used in the ECW system, provide information relative to the conservatisms used in the calculation that establishes the lifetime of the component to demonstrate that the coatings are not credited in aging management to protect metal surfaces.

Heat Exchangers (085)

RAI 3.3.2.4-2

Background
SRP-LR Table 2.1-3 states that both the pressure boundary and heat transfer functions for heat exchangers should be considered because heat transfer may be a primary safety function of these components. The staff noted that the NRC provided this clarification of the SRP-LR to the industry by letter dated November 19, 1999 (see ADAMS Accession No. ML993350072). In

addition, the GALL Report, Section IX.F, "Aging Mechanisms," states that fouling can be categorized as particulate fouling from dust and that fouling can result in a reduction of heat transfer

In RAI 3.3.2.4-1, the staff noted that heat exchangers with an intended function of heat transfer in various air environments were not being managed for reduction of heat transfer, and that these heat exchangers may be adversely affected by fouling due to dust. The staff requested STP to provide the technical bases demonstrating that reduction of heat transfer does not need to be managed for these components. In its response dated November 21, 2011, STP stated that the heat exchanger components exposed to the environments of "plant indoor air" and "ventilation atmosphere" are located inside buildings that are subject to a clean air environment, since the outside air is filtered prior to entry into the associated buildings. The response concluded that the building air environment is not considered conducive to heat exchanger fouling and accumulation of dust on heat exchanger surfaces.

Issue
Although outside air may be filtered prior to entry into the buildings, from a practical perspective, the air within the associated buildings cannot be considered a "clean air environment," because dust and debris are also generated inside the buildings during normal plant activities. If, however, the heat exchanger surfaces (like a room cooler) have air filters just prior to the component, that are periodically maintained, then the component could be considered to be exposed to a clear air environment. Otherwise, if the room air is circulated past heat exchanger surfaces without a filter that is periodically maintained, then the determination that this aging effect is not expected to occur would need to be confirmed. As noted in GALL AMP XI.M32, One-Time Inspection, "situations in which additional confirmation is appropriate include (a) an aging effect is not expected to occur, but data are insufficient to rule it out with reasonable confidence, or (b) an aging effect is expected to progress very slowly in the specified environment, but the local environment may be more adverse than generally expected."

Request
For heat exchanger-related AMR items in the LRA that list an intended function of heat transfer in an environment of "plant indoor air," or "ventilation atmosphere," but do not consider reduction of heat transfer as an aging effect requiring management, either (a) provide information demonstrating that each item has an air filter that is periodically maintained reasonably close to the heat exchanger surfaces, (b) provide information from past inspections of components, which have never been cleaned, showing that fouling of heat exchanger surfaces in these environments is not occurring or is occurring so slowly that this aging effect does not require management, or (c) provide an appropriate program to manage reduction of heat transfer for the subject heat exchanger-related AMR items with a heat transfer function.

One-Time Inspection of ASME Code Class 1 Small-Bore Piping (036)

RAI B2.1.19-4

Background
In its RAI response dated January 18, 2012, the applicant indicated that its amendment, dated June 16, 2011, to the LRA provided sections with changes but did not provide the complete LRA Section B2.1.19 for the One-Time Inspection of ASME Code Class 1 Small-Bore Piping

program. The applicant further stated that the most recent revision to LRA Section B2.1.19 was provided in its letter dated November 17, 2011, which includes an exception to GALL AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping."

The program exception states that the applicant's risk-informed inservice inspection (RI-ISI) is based on EPRI TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," which incorporated EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)." The exception also states that the applicant uses its RI-ISI, instead of MRP-24, to manage thermal fatigue in reactor coolant system branch lines. It further states that the recommended inspection locations in MRP-24 are identical to those for inspection of thermal fatigue in its RI-ISI.

Issue

The staff noted that MRP-24 was superseded in 2005 by revised guidance, "Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines (MRP-146)." The staff further noted that MRP-146 and its supplement contain many improvements, including inspection locations, in managing thermal fatigue in reactor coolant system branch lines. GALL Report, Revision 2, recommends and references the revised guidance, MRP-146.

Given the different submittals provided by the applicant regarding this program, the staff needs clarification regarding the applicant's latest proposed One-Time Inspection of ASME Code Class 1 Small-Bore Piping program, specifically regarding whether the applicant intended to credit the previously proposed exception to GALL AMP XI.M35. As indicated above, the staff also does not find such exception acceptable as it does not provide a technical justification as to why use of the RI-ISI is sufficient when compared to the latest recommendation in GALL Report, Revision 2 (i.e., MRP-146).

Request

Provide or confirm the latest revision to the LRA with respect to the One-Time Inspection of ASME Code Class 1 Small-Bore Piping program.

As part of this submittal provide the technical basis to justify why the RI-ISI and its comparison to the outdated guidance in MRP-24 is adequate in managing thermal fatigue in reactor coolant system branch lines.

February 28, 2012

Mr. D. W. Rencurrel
Sr. Vice President, Technical
Support and Oversight
STP Nuclear Operating Company
P.O. Box 289
Wadsworth, TX 77483

SUBJECT: 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)

Dear Mr. Rencurrel:

By letter dated October 25, 2010, STP Nuclear Operating Company (STPNOC or the applicant) 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 or the staff). The 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.

These requests for additional information were discussed with Arden Aldridge, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me 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 w/encl: Listserv

DISTRIBUTION:
See next page

ADAMS Accession No. ML12053a430

OFFICE	LA: DLR/RPB1	PM: DLR/RPB1	BC: DLR/RPB1	PM: DLR/RPB1
NAME	YEdmonds	JDaily	DMorey	JDaily
DATE	02/27/12	02/28/12	02/27/12	02/28/12

OFFICIAL RECORD COPY

Letter to D. W. Rencurrel from John W. Daily dated February 28, 2012

SUBJECT: 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)

DISTRIBUTION:

E-MAIL:
PUBLIC
RidsNrrDlr Resource
RidsNrrDlrRpb1 Resource
RidsNrrDlrRpb2 Resource
RidsNrrDlrRerb Resource
RidsNrrDlrRpob Resource
RidsNrrDraApla Resource
RidsOgcMailCenter

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