



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

July 12, 2012

Mr. D. W. Rencurrel  
Chief Nuclear Officer  
STP Nuclear Operating Company  
P.O. Box 289  
Wadsworth, TX 77483

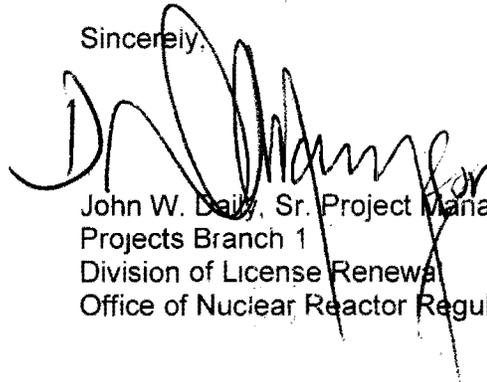
SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION – AGING MANAGEMENT, SET 22 (TAC NOS. ME4936 AND ME4937)

Dear Mr. Rencurrel:

By letter dated October 25, 2010, STP Nuclear Operating Company, submitted an application pursuant to Title 10 of the *Code of Federal Regulation* 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](mailto:john.daily@nrc.gov).

Sincerely,



John W. Daily, 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

cc w/encl: Listserv

SOUTH TEXAS PROJECT, UNITS 1 AND 2,  
REQUEST FOR ADDITIONAL INFORMATION  
AGING MANAGEMENT, SET 22  
(TAC NOS. ME4936 AND ME4937)

**RAI B2.1.9-3c (021)**

Background:

During a telephone conference call on April 24, 2012, NRC staff and South Texas Project Nuclear Operating Company (the applicant) discussed Draft RAI B2.1.9-3b, which addressed aging management activities associated with internal coatings where intended functions of downstream components could be affected by coating failures. The draft RAI cited the applicant's previous responses to RAI B2.1.9-3 that noted operating experience from CR 07-16847, and stated that a) foreign material was found in one of the intercoolers, b) the engineering evaluation determined that some of the foreign material was consistent with erosion of the coating material used for the intercooler ribs, and c) the majority of the particles were smaller than the 3/8-inch tube diameter. The draft RAI also cited the applicant's previous response to RAI B2.1.9-3 that noted operating experience from CR 11-1218, and stated that pieces of coatings were found in the ends of some tubes in the reactor containment building chiller 11B.

The draft RAI also noted recent industry operating experience that revealed some internal linings or coatings are considered limited-life installations with a service life of less than 20 years, and noted that as the end of service life is approached, past performance of the coating may not accurately predict the coating's future behavior. Further, the draft RAI discussed inspection techniques in addition to visual inspections to detect delamination, such as some form of physical manipulation, and increasing the frequency of inspections as the service life of the coating is approached. After discussions during the telephone conference, the applicant and the staff agreed that the draft RAI was not needed, and by letter dated May 10, 2012, the applicant subsequently supplemented its previous responses to RAI B2.1.9-3.

The May 10, 2012, response provides the aging management review (AMR) items that are used to manage the heat exchangers exposed to raw water which have a potential for macroscopic fouling due to coating degradation. These include component cooling water (CCW) heat exchangers, the CCW pump room heat exchangers, the air handling unit (AHU) condenser heat exchangers, and the three heat exchangers associated with each standby diesel generator, all of which are managed for reduction of heat transfer.

The response states that the vendor's application data sheets do not specify the use of a physical-mechanical contact type of test for cure or adhesion verification, and that although testing, such as a pull-off adhesion test, can be used to prove that the coating has not lost any adhesive or cohesive properties, such testing results in destruction of the coating. Regarding the need to increase the frequency of inspections as the service life of a coating is approached, the response does not specifically address whether the coatings are considered limited-life installations, but in summarizing, it refers to them as "permanent coatings" applied at South Texas Project. The response states that the coatings are not expected to delaminate in large flakes or sheets between inspection intervals and that operating experience demonstrates that the effects of aging are being adequately managed by the Open Cycle Cooling Water System program.

ENCLOSURE

Based on the staff's review of plant-specific operating experience, coatings have degraded and released material into the system. Although the applicant does not believe coatings will delaminate in large flakes, plant-specific operating experience exists which indicates that some coatings have broken off in pieces that apparently were too large to pass through the downstream heat exchanger tubes. The staff acknowledges that, to date, the amount of material has not adversely affected heat exchanger intended function.

Issue:

The staff has identified three issues:

- 1) The inspection frequency of the coatings should consider the service life of the installed coating as well as the trending of ongoing coating inspections. As the end of service life approaches, past performance of the coating may not accurately predict the coating's future behavior. Recent industry operating experience reviews indicate that coating failures were caused by operation of the coatings beyond their qualified service life without appropriate justification. In that regard, the service life, as described in EPRI 1019157, "Guideline on Safety-Related Coatings," should initially be identified from the process that installed the coating, and if, during the period of extended operation, the coatings will be operated beyond the qualified service life, then an appropriate justification should be provided. Since the applicant's response refers to the coatings as "permanent coatings," the applicant should document what that expected life is (e.g., whether for 10 years, 20 years, the remaining life of the unit, etc.). Furthermore, if the coatings in question have a finite life (otherwise known as a service life), it is not clear to the staff how operation that approaches or exceeds the service life will be adequately managed during the period of extended operation.
- 2) Although visual examination of coatings can identify degradation indicative of delamination, EPRI 1019157, states that "*lightly tapping the exposed coating may indicate disbondment that may not be evident with visual inspection.*" In addition, with regard to adhesion testing, ASTM D4541, "Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers," which is discussed in EPRI 1019157, indicates that the testing determines **either** the force that a surface area can bear before a plug of material is detached **or** whether the surface remains intact at a prescribed force. As such, adhesion testing does not necessarily result in the destruction of the coating as stated in the applicant's response. Since the vendor's application data sheets did not specify the use of a physical-mechanical contact type of test for adhesion verification, it is not clear to the staff how adhesion degradation will be adequately identified, other than being revealed after the fact.
- 3) For visual inspections of the coatings performed through this program, EPRI 1019157 states that Coatings Surveillance Personnel should meet applicable plant licensing commitments and be approved by the utility Nuclear Coating Specialist. The qualification recommendations of a Nuclear Coating Specialist are defined in ASTM D7108, "Standard Practice for Establishing Qualifications for a Nuclear Coating Specialist." It is not clear to the staff whether the personnel performing the coatings assessment visual inspections are properly qualified to industry recommendations.

Request:

For those locations where coating failures may adversely affect the safety function of downstream components, or result in an 10 CFR 54(a)(2) function not being met:

- 1) For each location, provide the service life as established by the coating vendor or by an engineering evaluation for the first installation of the coating, and for locations where the coating may be operated approaching or beyond the qualified service life during the period of extended operation, explain the actions that the current program contains to ensure downstream components are not adversely affected.
- 2) Since physical-mechanical testing was not initially performed to verify cure or adhesion of coatings and the current program does not include any physical-mechanical testing, provide information justifying why some type of physical test does not need to be periodically performed to verify coating adhesion, during the period of extended operation.
- 3) Provide information regarding the qualifications of individuals that will perform coatings assessment during the period of extended operation. In addition, state whether coatings in this program will be under the technical direction of a Nuclear Coating Specialist, with responsibilities and qualifications as described in EPRI 1019157, or provide technical bases describing why oversight by such an individual is not needed.

Letter to D. W. Rencurrel from John W. Daily dated July 12, 2012

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Sincerely,

**/RA DMOREY FOR /**

John W. Daily, 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

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