From: Sayoc, Emmanuel
To: Paul Aitken; Eric A Blocher
Cc: Wu, Angela
Subject: Draft RAIs on Internal Coatings
Date: Wednesday, May 08, 2019 12:59:00 PM
Attachments: 015 Surry Internal Coatings RAIs Allik Holston_ERO V2.docx

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We will schedule a call soon.

Standby

Thanks

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Surry TRP 015 Internal Coatings RAIs - Allik

Regulatory Basis

10 CFR 54.21(a)(3) requires an applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation. One of the findings that the staff must make to issue a renewed license (10 CFR 54.29(a)) is that actions have been identified and have been or will be taken with respect to managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under 10 CFR 54.21, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis. In order to complete its review and enable making a finding under 10 CFR 54.29(a), the staff requires additional information in regard to the matters described below.

RAI B2.1.28-1

Background:

SLRA Section B2.1.28, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," states "[t]he Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program is an existing program that, following enhancement, will be consistent, with exception, to NUREG-2191, Section XI.M42, Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks."

GALL-SLR Report AMP XI.M42, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," states the scope of the program includes components exposed to closed-cycle cooling water, raw water, treated water, treated borated water, waste water, fuel oil, and lubricating oil. The scope of the program does not include environments with elevated temperatures.

SLRA Table 3.1.2-3, "Reactor Vessel, Internals, and Reactor Coolant System - Reactor Coolant - Aging Management Evaluation," states that loss of coating integrity will be managed for the internally coated carbon steel pressurizer relief tank by the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program.

Updated Final Safety Analysis Report (UFSAR) Table 4.1-3, "Pressurizer and Pressurizer Relief Tank Design Data," states that the pressurizer relief tank has a normal water temperature of 120 degrees F and a design temperature of 340 degrees F. In addition, UFSAR Section 4.2.2.5, "Pressurizer Relief Tank," states the following:

> Steam discharged from the power-operated relief valves or from the safety valves passes to the pressurizer relief tank, which is partially filled with water at or near containment ambient temperature, under a predominantly nitrogen atmosphere. Steam is discharged under the water level to condense and cool by mixing with the water. The tank is equipped with a spray, and a drain to the vent and drain system (Section 9.7), which is operated to cool the tank following a discharge.

Issue:

The SLRA or UFSAR does not contain information in regard to what the internal coatings are constructed of and the maximum temperature rating of the coatings. In addition, the SLRA or

UFSAR does not include a description of the operational controls that would limit the time that the coatings would be exposed to an elevated temperature.

Request:

a) State the coating material type and if possible manufacturer, and the coatings maximum design rating.

b) Describe any operational controls that would minimize the exposure time to higher temperatures.

RAI B2.1.28-2 (regarding carbon fiber reinforced polymer (CFRP)) is covered in a separate file titled “XXX Surry CFRP RAI Allik Gavula Holston.docx.”

RAI B2.1.28-3

Background:

As amended by letter dated April 2, 2019, the “program description” section, Exception No. 2, and Enhancement No. 1 of SLRA Section B2.1.28 state that for piping, all accessible surfaces are inspected.

GALL-SLR Report AMP XI.M42 states for piping, either inspect a representative sample of seventy-three 1-foot axial length circumferential segments of piping or 50 percent of the total length of each coating/lining material and environment combination, whichever is less at each unit.

Issue:

The SLRA lacked specificity on how much inaccessible piping will not be inspected for each coating/lining material and environment combination (i.e., population). The staff seeks confirmation on whether the minimum inspection sample size for piping will be consistent with GALL-SLR Report AMP XI.M42 recommendations.

Request:

Provide clarification regarding how much inaccessible piping will not be inspected for each population. Provide justification if based on the amount of inaccessible piping, minimum inspection sample size for any population will not be consistent with GALL-SLR Report AMP XI.M42 recommendations.

RAI B2.1.28-4

Background:

As amended by letter dated April 2, 2019, SLRA Section B2.1.28, Exception No. 2, states “[a]n exception is taken to performance of baseline inspections during each inspection interval.”

SLRA Table A4.0-1, “Subsequent License Renewal Commitments,” Item 28, “Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program,” states “[i]nspections that are to be completed prior to the subsequent period of extended operation are completed 6 months prior to the subsequent period of extended operation or no later than the last refueling outage prior to the subsequent period of extended operation.”

GALL-SLR Report AMP XI.M42 states the following:

> If a baseline has not been previously established, baseline coating/lining inspections occur in the 10-year period prior to the subsequent period of extended operation. Subsequent inspections are based on an evaluation of the effect of a coating/lining failure on the in-scope component's intended function, potential problems identified during prior inspections, and known service life history. Subsequent inspection intervals are established by a coating specialist qualified in accordance with an ASTM International standard endorsed in Regulatory Guide (RG) 1.54. However, inspection intervals should not exceed those in Table XI.M42-1, "Inspection Intervals for Internal Coatings/Linings for Tanks, Piping, Piping Components, and Heat Exchangers."

Issue:

For internally coated piping, piping components, heat exchangers, and tanks not covered by Exception Nos. 1 and 3, the staff seeks confirmation regarding if baseline inspections, qualifications of the individuals establishing subsequent inspections intervals, and maximum inspection interval length will be consistent with GALL-SLR Report AMP XI.M42. Specifically, the staff notes the following:

a) The revised SLRA Section B2.1.28 states that baseline inspections will not occur in each interval; however, SLRA Table A4.0-1 states that baseline inspection may occur prior to the subsequent period of operation (SPEO). The staff seeks confirmation regarding if and when baseline inspections will occur.

b) The revised SLRA Section B2.1.28 does not include a statement that subsequent inspection intervals are established by a coating specialist qualified in accordance with an ASTM International standard endorsed in RG 1.54.

c) The revised SLRA Section B2.1.28 does not include a statement that inspection intervals will not exceed those specified in GALL-SLR Report Table XI.M42-1.

Request:

For internally coated piping, piping components, heat exchangers, and tanks not covered by Exception Nos. 1 and 3, clarify if: (a) baseline inspections will be performed consistent with GALL-SLR Report AMP XI.M42; (b) subsequent inspection intervals will be established by a coating specialist qualified in accordance with an ASTM International standard endorsed in RG 1.54; and (c) inspection intervals will not exceed those specified in GALL-SLR Report Table XI.M42-1. Provide technical justification if (a), (b), or (c) will not be consistent with GALL-SLR Report AMP XI.M42 recommendations.

RAI B2.1.28-5

Background:

As amended by letter dated April 2, 2019, SLRA Section B2.1.28, Enhancement No. 1 provides a list of components, including tanks, which will be inspected as part of the program. This list did not include the security diesel fuel oil tank, which is being managed for loss of material using the Fuel Oil Chemistry program.

As amended by letter dated April 2, 2019, SLRA Section B2.1.18, "Fuel Oil Chemistry," Exception No. 1 states the following regarding the security diesel fuel oil tank: "[t]he wall of the interior tank is provided with a solvent-based rust preventive film (not considered a coating)."

The “scope of program” program element of GALL-SLR Report XI.M42 recommends that internally coated tanks exposed to fuel oil, where loss of coating or lining integrity could prevent satisfactory accomplishment of any of the component’s or downstream component’s current licensing basis (CLB) intended functions, are included within the scope of the program.

Issue:

From information provided in the SLRA, it appears that if the “solvent-based rust preventative film” were to degrade due to age-related mechanisms, it might impact the intended function of the security diesel fuel oil tank, or downstream components (e.g., diesel injectors). Due to this, it appears that the “solvent-based rust preventative” should be included in the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program as per the recommendations of GALL-SLR Report AMP XI.M42.

The SLRA does not provide information on potential age-related failure modes for the “solvent-based rust preventative.” The staff is unable to determine how it might degrade, and if this might impact the intended function of in-scope components. Different degradation mechanisms might impact the intended function of different components depending on if the film degrades into large sheets, small particles, etc.

Request:

1. Based on potential age-related failure modes that could impact the intended function of the security diesel fuel oil tank, or downstream components, provide a basis for why the “solvent-based rust preventative film” was not included in the scope of the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program.
2. Additionally, describe any potential age-related failure modes of the “solvent-based rust preventative film,” that might impact the intended function of the security diesel fuel oil tank, or downstream components.

RAI B2.1.28-6

Background:

As amended by letter dated April 2, 2019, SLRA Section B2.1.28, Enhancement No. 7 states “[p]rocedures will be revised to require a pre-inspection review of the previous "two" condition assessment reports, when available, be performed, to review the results of inspections and any subsequent repair activities.”

In addition to the statement above, GALL-SLR Report AMP XI.M42 states the following:

> A coatings specialist prepares the post-inspection report to include: a list and location of all areas evidencing deterioration, a prioritization of the repair areas into areas that must be repaired before returning the system to service and areas where repair can be postponed to the next refueling outage, and where possible, photographic documentation indexed to inspection locations.

Issue:

The staff seeks clarification for why Enhancement No. 7 does not include the GALL-SLR Report AMP XI.M42 recommendation regarding preparation of a post-inspection report by a coatings specialist.

Request:

State the basis for why Enhancement No. 7 does not include the GALL-SLR Report AMP XI.M42 recommendation regarding preparation of a post-inspection report by a coatings specialist.

RAI B2.1.28-7

Background:

SLRA Section B2.1.2.28 states that the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program will be consistent with GALL-SLR Report AMP XI.M42 with exception (not related to this RAI).

As amended by letter dated April 2, 2019, the "operating experience (OE) summary" section of SLRA Section B2.1.28 states, "[t]he component cooling heat exchanger channel heads are epoxy-coated carbon steel exposed to raw water (service water). Inspections are performed yearly, which allows early detection of degradation of coatings and underlying metal." The OE summary also states that an inspection of the 1B component cooling water heat exchanger inlet and outlet endbells in 2016 revealed 25 areas requiring coating repair and 3 locations requiring weld repair.

GALL-SLR Report Table XI.M42-1 recommends that internal coatings/lining for piping, piping components, heat exchangers, and tanks are inspected every 4 or 6 years based on the inspection category.

Issue:

It appears that based on the plant-specific OE, the component cooling heat exchangers are inspected more frequently than the guidance provided in GALL-SLR Report Table XI.M42-1, "Inspection Intervals for Internal Coatings/Linings for Tanks, Piping, Piping Components, and Heat Exchangers. Given that the Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program will be consistent with GALL-SLR Report AMP XI.M42, the frequency of inspections of the component cooling heat exchangers could exceed the annual inspection interval because the frequency of inspections is not reflected in the current licensing basis. There is no basis for why the annual inspections of the component cooling heat exchangers is not reflected in the current licensing basis for the SPEO.

Request:

State the basis for why the annual inspections of the component cooling heat exchangers is not reflected in the current licensing basis for the SPEO.