From: Sayoc, Emmanuel
To: "Paul Aitken"; "Eric A Blocher"
Cc: Wu, Angela
Subject: First Batch of Draft Surry RAIs
Date: Wednesday, April 03, 2019 9:33:50 PM
Attachments: 027 083 084 085 Surry AMR RAIs Holston Huynh.docx
027 Surry AMP FWS RAIs Holston Huynh.docx
030 Surry Fuel Oil Chemistry RAI Chereskin Gardner.docx
032 Surry OTI RAI - Johnson Gardner.docx
036 Surry External Surfaces RAI Johnson Gavula.docx
039 Surry Lubricating Oil Analysis RAI Gardner ANC.docx
Importance: High

Paul, Eric,

See attached. Our first batch of draft RAIs. Recommend we have a clarification call in about a week's time? Here is a summary.

Thanks,
Manny

Rai_ ID	RAI Pkg	TRP	RAI Number	Issue	Branch	Reviewer	Date Draft Sent To Applicant
1	1	27	3.2.2.1.1-1	Fire Water System	MCCB	Holston, Huynh	4/3/2019
2	1	27	3.2.2.1.1-2	Fire Water System	MCCB	Holston, Huynh	4/3/2019
3	1	27	B2.1.16-1	Fire Water System	MCCB	Holston, Huynh	4/3/2019
4	1	27	B2.1.16-2	Fire Water System	MCCB	Holston, Huynh	4/3/2019
5	1	27	B2.1.16-3	Fire Water System	MCCB	Holston, Huynh	4/3/2019
6	1	27	B2.1.16-4	Fire Water System	MCCB	Holston, Huynh	4/3/2019
7	1	27	B2.1.16-5	Fire Water System	MCCB	Holston, Huynh	4/3/2019
8	1	27	B2.1.16-6	Fire Water System	MCCB	Holston, Huynh	4/3/2019
9	1	27	B2.1.16-7	Fire Water System	MCCB	Holston, Huynh	4/3/2019
10	1	32	B2.1.20-1	One Time Inspection	MCCB	Johnson, Gardner	4/3/2019
11	1	36	B2.1.23-1	External Surfaces	MCCB	Johnson, Gavula	4/3/2019
12	1	39	B.2.1.26-1	Lubricating Oil Analysis	MCCB	Gardner	4/3/2019
13	1	30	B.2.1.18-1	Fuel Oil Chemistry	MCCB	Chereskin	4/3/2019

Surry TRP 027, 083, 084, & 085 AMR RAIs - Holston

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 3.2.2.1.~~¥~~1-1

Background: GALL-SLR Report item S-454 recommends that cracking be managed as an aging effect for copper alloy greater than 15 percent zinc components exposed to air or condensation.

There are many SLRA Table 2 items that state that copper alloy greater than 15 percent zinc components exposed to air-indoor uncontrolled have no aging effects. SLRA Change Notice No. 1, (ADAMS Accession No. ML19042A137) states:

- "[t]he air-indoor uncontrolled environment is assigned to components that are uninsulated, or not exposed to condensation."
- "[c]racking of copper alloy >15% Zn in air is not expected in the absence of wetting and ammonia contaminants, which are not present in the air-indoor uncontrolled environment."

Issue:

A basis has not been provided for why ammonia compounds are not present in the air-indoor uncontrolled environment. For example, if ammonia compounds are present in insulation installed on an in-scope pipe or one that is not in-scope and packing leakage or gasket leaks were to occur, ammonia compounds could be transported to the surface of in-scope components constructed from copper alloy greater than 15 percent zinc. Depending on the concentration of the ammonia compounds, this could result in cracking. This is consistent with NUREG-2221, which states:

> Based on a review of ASM Handbook, Volume 13B, "Corrosion: Materials, Corrosion of Copper and Copper Alloys," ASM International, 2006, pages 129–133, the staff concluded that copper alloy (>15% Zn or >8% Al) is susceptible to cracking due to SCC in air or condensation environments depending on the presence of ammonia-based compounds. In addition to being present in the outdoor air environment, they could be conveyed to the surface of a copper alloy (>15% Zn or >8% Al) component via leakage through the insulation from bolted connections (e.g., flange joints, valve packing).

Request:

State the basis for why there are no more than trace amounts of ammonia compounds in the vicinity of in-scope components. If there are more than trace amounts of ammonia compounds in the vicinity of in-scope piping, state the basis for why cracking is not considered an applicable aging effect for components constructed from copper alloy greater than 15 percent zinc and exposed to air-indoor uncontrolled.

RAI 3.2.2.1.~~¥~~1-2

Background: During its review of some aging management items that were cited as being not applicable to the Surry units, the staff noted the following:

a) SLRA Table 3.3-1, item 3.3.1-178, states that there are no in-scope fiberglass piping and piping components exposed to concrete in the Auxiliary Systems. However, UFSAR Section 9.10.4.18 states that there is fiberglass piping in mechanical equipment room number 4 (MER-4).

b) SLRA Table 3.3-1, item 3.3.1-184, states that there are no in-scope PVC piping, piping components or tanks exposed to concrete in the auxiliary systems. However, UFSAR Table 11.2-1, Waste Processing System Design Data," states that some portions of the liquid waste reverse osmosis unit are constructed of PVC. SLRA Section 2.3.3.23, states that some portions of the liquid waste system are in-scope.

c) SLRA Table 3.1-1, item 3.1.1-105, states that loss of material of steel with an external environment of concrete is not applicable to components in the reactor coolant system. SLRA Section 3.1.2.2.15 states that the steel neutron shield tanks are the only steel components exposed to concrete in the reactor coolant system. SLRA Table 3.1-1, item 3.1.1-115, states that there are no stainless steel components exposed to concrete in the reactor coolant system. However, UFSAR Section 4.1.2.9, "Reactor Coolant Pressure Boundary Surveillance," states, "[t]he reactor arrangement within the containment provides sufficient space for inspection of the external surfaces of the reactor coolant piping, except for the area of pipe within the primary shielding concrete."

d) SLRA Section 3.2.2.2.9 states, "[t]he concrete exposed stainless steel piping aligned to [item 3.2.1-091] is embedded within interior concrete at the containment sump and is not potentially exposed to groundwater. There are no aging effects identified that require aging management." SLRA Table 3.2.2-4 plant specific note 8 states, "[s]uction piping embedded in concrete from the containment sump is not exposed to groundwater, and has no aging effects requiring management." However, UFSAR Table 6.3-3 states that there is an outside recirculation spray pump (cited in SLRA Table 3.2-2) set in concrete. SLRA Table 3.2.2-2 includes the recirculation spray pump casing but does not cite concrete as an applicable environment.

e) SLRA Table 3.2.1, item 3.3.1-146, states that there are no in-scope stainless steel underground piping, piping components, and tanks in the auxiliary systems. However, UFSAR Section 9.10.2.3.2 states that the technical support center charcoal filter units are located in a service building vault. In addition, UFSAR Section 9.10.4.3 states that there are containment penetration vaults and UFSAR 9.10.4.7 states that there are outside containment penetration vaults.

Issue:

a) While UFSAR Section 9.10.4.18 does not conflict with item 3.3.1-178, it could be possible that the fiberglass piping in MER-4 penetrates the concrete floor.

b) While UFSAR Table 11.2-1 does not conflict with item 3.3.1-184, it could be possible that there could be PVC piping that penetrates the concrete floor

c) While UFSAR Section 4.1.2.9 does not conflict with items 3.1.1-105 and 3.1.1-115, it could be possible that there are other steel components and stainless steel components exposed to concrete in the vicinity of the primary shielding concrete.

d) While UFSAR Table 6.3-3 does not conflict with SLRA Section 3.2.2.2.9 or Table 3.2.2-2, it could be possible that the recirculation spray pump casing is exposed to concrete. In addition, given the pump's location, it is possible that the concrete could be exposed to ground water.

e) While the UFSAR Chapter 9 references do not conflict with item 3.3.1-146, it is possible that there could be stainless steel piping, piping components, or tanks located in vaults meeting the criteria for the underground environment in the auxiliary systems.

Request:

a) Confirm that there are no in-scope fiberglass piping and piping components exposed to concrete in the auxiliary systems.

b) Confirm that there are no in-scope PVC piping and piping components exposed to concrete in the auxiliary systems.

c) Confirm that there are no steel components other than the neutron shield tanks nor stainless steel components exposed to concrete in the reactor coolant system.

d) State whether the recirculation spray pump casing is exposed to concrete. If it is exposed to concrete, state whether the concrete could be exposed to ground water.

e) Confirm that there are no in-scope stainless steel underground piping, piping components, and tanks in the auxiliary systems.

Surry TRP 027 AMP RAIs - Holston

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 B2.1.16-1

> **I am reserving this number for an RAI associated with Exception No. 1, fire protection/domestic water storage tank inspection intervals**. This RAI will be developed subsequent to the on-site audit and wall thickness inspections on both tanks that are expected to be conducted prior to the on-site audit. The RAI will be related to tank wall thickness inspection intervals during the SPEO. (AMP Breakout Questions (BQ) BQ-3, BQ-13, and BQ-14).

RAI B2.1.16-2

Background:

SLRA Section B2.1.16, Exception No. 2 states that 20 percent of the standpipes and risers will have main drains tests every refueling cycle. GALL-SLR Report AMP XI.M27, Table XI.M27-1, "Fire Water System Inspection and Testing Recommendations," recommends main drain tests at each water-based system riser to determine if there is a change in the condition of the water piping and control valves on an annual or refueling outage interval. Table XI.M27-1, footnote 10 states, "[w]here NFPA 25 or this table cite annual testing or inspections, testing and inspections can be conducted on a refueling outage interval if plant-specific OE [operating experience] has shown no loss of intended function of the in-scope SSC [system, structure, or component] due to aging effects being managed for the specific component (e.g., loss of material, flow blockage due to fouling)."

During the staff's review of plant-specific operating experience, several instances of clogged piping or strainers were noted as follows:

Condition Report Number	Year	Brief Description
380377	2010	The sensing line upstream of a main drain gauge isolation valve is clogged as evidenced by the static and dynamic pressure reading being the same.
393845	2010	A drain on unit 1 south side turbine building is clogged. A subsequent condition report, 398027 (10/06/2010), confirmed that blockage was not downstream of the drain valve.
398027	2010	Approximately one inch of rusty debris blocked line
463714	2012	Approximately one inch of rusty debris blocked line

Condition Report Number	Year	Brief Description
496837	2012	The strainer downstream of an inspector test valve is clogged with debris and damaged beyond repair.
1044047	2016	Clogged fire water line.

Issue:

The staff has accepted sampling-based testing of main drains in prior license renewal safety evaluation reports based on consistency (i.e., 20 percent of the items tested, maximum of 25 tests) with the recommendations within several sampling-based GALL-SLR AMPs (e.g., AMP XI.M38, “Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components”). However, the staff conducts a review of plant-specific operating experience to ensure that there are no trends that would indicate that potential clogging could be affecting the intended function of downstream components (e.g., sprinklers, deluge valves). Although only two of the above condition reports are associated with main drains (i.e., 380377, 496837), all are indicative of complete blockage of a portion of the fire water system.

Sufficient information for the staff to understand the consequences of these flow blockage incidents in relation to affecting the intended function of portions of the fire water system is not available.

Request:

State the basis for why all in-scope standpipes and risers main drain tests should not be conducted during the first inspection interval and, if applicable, the acceptance criteria that would be used to transition to a sampling-based program.

RAI B2.1.6-3

Background:

The Program Description for the Fire Water System program states:

> Portions of water-based fire protection system components that have been wetted, but are normally dry, such as dry-pipe or preaction sprinkler system piping and valves, were designed and installed with a configuration and pitch to allow draining. With the exception of two locations, Engineering walkdowns confirmed the as-built configuration that allows draining and does not allow water to collect. Corrective actions have been initiated for the two locations to verify a flow blockage condition does not exist and to restore the two locations to original configuration requirements that allow draining and do not allow water to collect. After corrective actions, portions of the water-based fire protection system that have been wetted, but are normally dry, will not be subjected to augmented testing and inspections beyond those required by NUREG-2191, AMP XI.M27, Table XI.M27-1.

SLRA Section B2.1.16, Enhancement No. 11 states that, “[t]he Unit 1 hydrogen seal oil system deluge sprinkler pipe and Unit 1 station main transformer ‘1A’ deluge sprinkler piping will be reconfigured to allow drainage.”

GALL-SLR Report AMP XI.M27 recommends that for portions of water-based fire protection system components that have been wetted but are normally dry that cannot be drained or piping segments that allow water to collect are subjected to augmented testing including periodic internal visual examinations or flushes and wall thickness measurements.

Issue;

The purpose of the augmented inspections for the periodically wetted piping that cannot be drained or that allow water to collect is to ensure that the more aggressive corrosion environment (i.e., due to the presence of moisture and oxygen) that occurs in these locations does not result in: (a) the buildup and transport of corrosion products that can result in downstream flow blockage; and (b) aggressive loss of material in the vicinity of the aggressive environment.

Although the actions being taken as a result of Enhancement No. 11 will eliminate the aggressive corrosion environment, the potential consequential buildup of corrosion products and piping wall loss could have occurred. In regard to the unit 1 main transformer 1A deluge sprinkler piping, the staff has concluded that there is reasonable assurance that corrosion products have not resulted in potential flow blockage because these deluge systems are periodically full flow tested. However, even though the unit 1 hydrogen seal oil system deluge sprinkler piping is tested with air, testing with air is not as sensitive for detecting flow blockage due to fouling. Both deluge system could have been subjected to aggressive loss of material in the vicinity of the periodically wetted piping that cannot be drained or that allow water to collect.

Request:

State the basis for why the unit 1 hydrogen seal oil system deluge sprinkler piping will not be visually inspected for corrosion products or full flow tested subsequent to installation of the associated modifications.

State the basis for why the unit 1 main transformer 1A and unit 1 hydrogen seal oil system deluge sprinkler piping will not be examined for wall thickness in the vicinity of the periodically wetted piping that cannot be drained or that allow water to collect subsequent to installation of the associated modifications.

RAI B2.1.6-4

Background: SLRA Section B2.1.6 states that the Fire Water System program will be consistent with GALL-SLR AMP XI.M27, with exceptions and enhancements. As described in RAI B2.1.16-2, GALL-SLR AMP Table XI.M27-1, footnote 10, would allow the visual sprinkler inspections to be conducted on a refueling outage interval in lieu of annual inspections if plant-specific OE has shown no loss of intended function of the sprinklers.

During the staff's review of plant-specific operating experience it was noted that several sprinklers have been found to be leaking, corroded, or failed as follows. The results of follow-on inspections or maintenance was obtained from portal documents.

Condition Report Number	Year	Brief Description
002099	2006	A sprinkler head at the west end of the unit 2 condenser was found to be leaking at 40 drops per minute (dpm). The work order was cancelled.
007510	2007	A sprinkler head in the laundry building was found to be spraying a fine mist. Closed to a work order.
485731	2012	Corrosion was detected on a sprinkler in the chemistry primary hot lab. No follow-on information was provided.
496505	2012	A sprinkler head in the turbine building was found to be leaking at 10 dpm. A subsequent condition report, 497330, stated that the leak had increased to 2 dps. A follow-on inspection noted that the fuse was missing.
497330	2012	A sprinkler head was found to be leaking in the unit 2 turbine building at 2 dps. A follow-on inspection noted that the fuse was missing.
503979	2013	A unit 2 turbine building sprinkler head was found to be spraying water. A follow-on inspection noted that the fuse was missing.
1080728	2017	A sprinkler head above the unit 2 air ejector failed. No follow-on information was provided.

Issue:

The above symptoms could be indicative of sprinklers that would not have met their intended function. The SLRA lacks sufficient information for the staff to conclude whether the intended functions of the sprinklers could have been met.

Request:

Respond to the following:

a) State whether any of the above instances of leaking, corrosion, or failure, or any other instances documented in the corrective action program, resulted in the inability of the sprinkler to meet its intended function.

b) If they met their intended function, state the basis for this conclusion.

c) If any sprinklers would not have met their intended function, state the basis for the periodicity of sprinkler visual inspections.

RAI B2.1.6-5

Background:

During the staff's review of plant-specific operating experience it was noted that there were several instances where surface water was detected in the vicinity of fire water piping, as follows.

Surry TRP 027 AMP RAIs - Holston

	Condition Report Number	Year	Brief Description
1	105806	2008	Surface water was detected near a fire hydrant adjacent to the training center parking lot. The follow-on actions noted that a tee was leaking. The tee is not in-scope.
2	474655	2012	Surface water was detected in the vicinity of post indicating valve 1-FP-1024. Piping was replaced. The piping is not in-scope.
3	504380	2013	Surface water was detected in the vicinity of 1-FP-1027. A hydrant and gate valve were replaced. Neither is in-scope.
4	556008	2014	Surface water was detected in the vicinity of 1-FP-535. Closed to a work order in planning. There is no in-scope piping in the vicinity.
5	580443	2015	Surface water was detected in the vicinity of 1-FP-542. Closed to a work order in planning. There is no in-scope piping in the vicinity.
6	1086752`	2017	Surface water was detected in the vicinity of 1-FP-379; by the training center. Closed to a work order in planning. The valve is not in-scope.
7	1019199	2015	Surface water was detected in the vicinity of 1-FP-321. Work order in planning. The cause appears to be a failure of the upper valve plate (on 1-FP-326) to isolate the drain ring. The valve is not in-scope.
8	329250	2009	Surface water was detected at the north east corner of a construction site laydown area within 100 feet of 1-FP-1046. The work order was closed because follow-on inspections did not detect a leak.
9	345000	2009	Surface water was detected in the vicinity of post indicating valve 01-FP-86. The work order was closed because follow-on inspections did not detect a leak.
10	477285	2012	Surface water was detected in the vicinity of hose house 29. A follow-on inspection could not recreate the conditions.
11	553533	2014	Surface water was detected in the vicinity of hose house 13. The work order was closed because follow-on inspections did not detect a leak.
12	1079710	2017	Surface water was detected in and around fire hose house 31; less than one gallon per hour. The work order was closed because follow-on inspections did not detect a leak.
13	330747	2009	Surface water was detected in the vicinity of the station training center. A concrete kicker moved, allowing the pipe to slide out of the tee.
14	456235	2011	Surface water was detected in the vicinity of fire hydrant 1-FP-708. The hydrant flange joint was leaking, not the pressure boundary. Retightened fittings and conducted a six hour leak check.

	Condition Report Number	Year	Brief Description
15	470098	2012	Surface water was detected in the vicinity of 1-FP-100. Closed to work order to repair a packing leak.
16	497754	2012	Surface water was detected in the vicinity of curb box valve 1-FP-1010. The cause was an out of position valve.
17	498946	2012	Surface water was detected in the vicinity of post indicating valve 1-FP-49. The leak was caused by a packing leak.
18	510828	2013	Surface water was detected in the vicinity of post indicating valve 1-FP-35. The stuffing flange was broken causing a packing leak.
19	538837	2014	Surface water was detected in the vicinity of the curb box near 1-FP-70. The leak was caused by a packing leak.
20	1087963	2018	Surface water was detected between 1-FP-124 and 1-FP-519. Leak was actually in the domestic water system, not fire water system. This portion of the domestic water system is not in-scope.

Issue:

While the condition reports were identified by the staff during the OE audit, the follow-on information was obtained from portal documents. Given that this information will in part be used in establishing a conclusion in the safety evaluation report, the staff requires that the information in the above table be confirmed by a submittal on the docket.

Although items 1 through 6 are outside the scope of license renewal. The provided information lacks sufficient detail to establish that similar failures would not occur in in-scope piping.

For item 7, the staff cannot complete its evaluation of whether the potential repair is associated in some way with the pressure boundary of the fire water piping.

Request:

a) Confirm or correct the information associated with potential fire water system leaks in the above table, items 1 – 20.

b) State the basis for why the causes of leakage for the not in-scope items discussed in items 1 through 6 would not also affect the pressure boundary function of in-scope fire water system components.

c) For item 7, provide a more thorough description of the degradation sufficient to demonstrate that it will not affect the pressure boundary of the component.

d) For the description of items 1 through 20 that are not correct, provide a basis for why the corrected information does not represent a challenge to the pressure boundary of in-scope fire water system components.

RAI B2.1.6-6

Background: **I am reserving this number for an RAI associated with OE.** The fire water pump testing has shown a decreasing performance trend. This RAI will be developed subsequent to additional pump testing they will be conducting sometime in the next two weeks The RAI will be related to pump testing intervals during the SPEO. (AMP Breakout Question 16)

Issue:

Request:

RAI B2.1.16-7

Background

SLRA Table 3.3.2-34 plant-specific note 4 states:

> The Fire Water System (B2.1.16) program is used instead of the Internal Coatings/Linings For In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.28) program to manage loss of material for internally coated carbon steel fire water storage tanks. The Fire Water System (B2.1.16) program manages degraded internal coatings consistent with NUREG-2191 Table XI.M27-1 note 4.

AMP XI.M27, Table X.M27-1, footnote 4 states:

> In regard to Sections 9.2.6.4 and 9.2.7: When degraded coatings are detected, the acceptance criteria and corrective action recommendations in GALL-SLR Report AMP XI.M42 are followed in lieu of Section 9.2.7 (1), (2), and (4). When interior pitting or general corrosion (beyond minor surface rust) is detected, tank wall thickness measurements are conducted as stated in Section 9.2.7 (3) in the vicinity of the loss of material. Vacuum box testing as stated in Section 9.2.7 (6) is conducted when pitting, cracks, or loss of material is detected in the immediate vicinity of welds.

SLRA Section B2.1.16 states, “[a]cceptance criteria, corrective action recommendations, and training/qualification of individuals involved in fire water storage tank internal coating inspections are implemented by the Internal Coatings/Linings For In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program (B2.1.28).”

SLRA Section A1.16 states, “[t]he Fire Water System program is an existing condition monitoring program that manages loss of material, flow blockage due to fouling, and loss of coating integrity for in-scope water-based fire protection systems.”

Issue:

The third paragraph in the above Background partially conflicts with the first in that some of the acceptance criteria and corrective actions associated with internal FWST coating inspections are contained in footnote 4 of Table XI.M27-1 in lieu of AMP XI.M42.

If cracking of copper alloy greater than 15 percent zinc fire water system components is an applicable aging effect as a result of the response to RAI 3.2.2.1.Y-1 and the Fire Water System program is used to manage this aging effect, the UFSAR supplement for the program does not reflect all of the potential aging effects.

Request:

a) State the basis for the conflicting statements between SLRA Table 3.3.2-34 and SLRA Section B2.1.16.

b) Update SLRA Section A1.16 as necessary based on the response to RAI 3.2.2.1.Y-1.

RAI B.2.1.18-1

Regulatory Basis

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 Section 54.29(a)) is that actions have been identified and have been or will be taken with respect to the 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 Section 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 (CLB). In order to complete its review and enable making a finding under 10 CFR Section 54.29(a), the staff requires additional information in regard to the matters described below.

Background:

In its SLRA, Section B2.1.18, “Fuel Oil Chemistry,” the applicant claimed consistency with the ”Monitoring and Trending” program element of Section XI.M30 of the GALL-SLR as it relates to testing for water and sediment in fuel oil. In its SLRA, the applicant stated that standard ASTM D1796-83, “Standard Test Method for Water and Sediment in Fuel Oil by the Centrifuge Method,” is used in the Fuel Oil Chemistry program to test fuel oil for water and sediment.

The GALL-SLR Report Section XI.M30, “Fuel Oil Chemistry,” recommends that the AMP monitor parameters such as water and sediment in diesel fuel oil. Additionally, the GALL-SLR Report references standard ASTM D975, “Standard Specification for Diesel Fuel Oils,” which provides guidance for determining the appropriate test methods to test for certain parameters, including water and sediment, in diesel fuel oil. This standard recommends the use of ASTM D2709, “Standard Test Method for Water and Sediment in Middle Distillate Fuels by Centrifuge,” for measuring water and sediment in Grade 2-D diesel fuel oil (the same grade that the Surry Power Station (SPS) uses). The standard recommends use of ASTM D1796, “Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure),” to test for water and sediment in Grade 4-D diesel fuel oil, which has different physical and chemical properties (e.g. higher viscosity) than Grade 2-D diesel fuel oil.

Issue:

In its SLRA that applicant states that it uses ASTM D1796-83 to test for water and sediment in its diesel fuel oil. However, this standard is recommended for use for different grade fuel oils than what is used at SPS.

Request:

Explain why the use of ASTM D1796-83 to test for water and sediment in Grade 2-D diesel fuel oil is appropriate given that the standard is specified for grade 4-D fuel oil (as per ASTM D975) which has different physical and chemical properties than the fuel oil used at Surry.

One-Time Inspection
Request for Additional Information

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 B2.1.20-1

Background

The GALL-SLR Report, AMP XI.M32, "One-Time Inspection," Element 3, "Parameters Monitored or Inspected," contains Table XI.M32-1, "Examples of Parameters Monitored or Inspected and Aging Effect for Specific Structure or Component," which recommends volumetric inspections to manage long-term loss of material. Note 1 to Table XI.M32-1, states:

> The examples provided in the table may not be appropriate for all relevant situations. If the applicant chooses to use an alternative to the recommendations in this table, a technical justification is provided as an exception to this AMP. This exception lists the aging management review line item component, examination technique, acceptance criteria, evaluation standard, and a description of the justification."

The Surry SLRA states that the One-Time Inspection program is a new program that will be consistent with the recommendations of the GALL-SLR Report, without any exceptions or enhancements to the program.

The NRC staff reviewed Surry's One-Time Inspection program Engineering Technical Evaluation (ETE-SLR-2018-1323, Rev. 1).

- Page 21, under the description of Element 3 "Parameters Monitored and Inspected," states, "If the piping diameter is too small to provide a meaningful volumetric examination, an internal visual examination will be performed."

- Page 27, under the description of Element 4 "Detection of Aging Effects," states, "Visual inspections will be performed if the component is opened for maintenance or if the piping diameter is too small to allow for a meaningful volumetric examination."

The visual inspections in Elements 3 and 4 are exceptions to the GALL-SLR and prevent the One-Time Inspection program from being consistent with the GALL-SLR.

Issue

A basis was not provided for the use of visual inspections in lieu of the volumetric inspections recommended in GALL-SLR AMP XI.M32.

One-Time Inspection
Request for Additional Information

Request

Provide a technical basis to support the proposed alternate inspection method in the One-Time Inspection program, for managing long-term loss of material.

RAI B2.1.23-1

Background

During a review of plant-specific operating experience, the staff noted that loss of material has occurred in the component cooling water system piping under pipe supports, which are exposed to an uncontrolled indoor air environment. After discovering the issue in 2014, one section of piping was replaced and monthly walkdowns of the component cooling water piping were implemented to visually check for leaks. In addition, ultrasonic testing has been performed annually to measure wall thickness of the component cooling water piping under pipe supports.

Issue

The actions indicate that the component cooling water piping under pipe supports is being monitored for age-related degradation; however, this plant-specific combination of component, material, and environment (specifically, corrosion under a pipe support) does not appear to have been included as a specific aging management review item that requires management during the subsequent period of extended operation.

Request

State the basis for not including this plant-specific combination of component, material, and environment as a specific aging management review item that requires management during the subsequent period of extended operation.

Alternately, describe the aging management program (plant-specific or otherwise) that will be used to monitor this plant-specific combination of component, material, and environment during the subsequent period of extended operation.

RAI B.2.1.26-1

Regulatory Basis

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 Section 54.29(a)) is that actions have been identified and have been or will be taken with respect to the 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 Section 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 (CLB). In order to complete its review and enable making a finding under 10 CFR Section 54.29(a), the staff requires additional information in regard to the matters described below.

Background:

In its SLRA, Section B2.1.26, "Lubricating Oil Analysis," the applicant stated that the Lubricating Oil Analysis program is an existing program that, will be consistent with NUREG-2191, Section XI.M39, Lubricating Oil Analysis program.

The GALL-SLR Report XI.M39 "Scope of Program," program element states that components within the scope of the program include piping, piping components; heat exchanger tubes; reactor coolant pump elements; and any other plant components subject to aging management review (AMR) that are exposed to an environment of lubricating oil.

Issue:

In applicant document ETE-SU-2015-1020, "Technical Basis for Equipment Oil Sampling Frequency," it states that obtaining oil samples from condensate motors, high pressure heater drain motors, low pressure heater drain motors, circulating water motors, component cooling pumps/motors, bearing cooling pumps/motors while the equipment is operating may place undue risk to the plant and personnel safety. It is not clear to the staff if these components are being sampled to detect contamination by moisture or excessive corrosion.

Request:

a) Clarify if the components mentioned above are being sampled to detect contamination by moisture or excessive corrosion using the Lubricating Oil Analysis program.
b) If the components mentioned above are not being sampled, state how the lubricating oil environment in the components mentioned above is maintained to the required quality to prevent or mitigate age-related degradation.
c) If the components mentioned above are sampled, state the frequency.