

Oconee Nuclear Station, Units 1, 2, and 3, Subsequent License Renewal Application (SLRA)

Breakout Audit Questions
TRP 027: Fire Water System

#	SLRA Section	SLRA Page	Question / Issue	Why are we asking?
1	3.3	3-726	<p>SLRA Table 3.3.2-4 cites AMR item VII.G.AP-197, 3.3.1-064 for managing loss of material and flow blockage of the copper alloy greater than 15 percent zinc valve body exposed internally to raw water by the Fire Water System program. Industry standard Note B is cited. However, this AMR item is for copper alloy piping and piping components exposed to raw water.</p> <p>Please discuss use of industry standard Note B.</p>	<p>The NRC staff is seeking clarification on the use of industry standard Note B.</p>
2	A2.16, A6.0, B2.1.16, 3.3	A-17, A-82, B-123, 3-725	<p>Table XI.M27-1 of NUREG-2191 recommends that the exterior inspections of water storage tanks follow NFPA 25 Section 9.2.5.5. Section 9.2.5.5 of NFPA 25 requires the exterior surfaces of water storage tanks and supporting structure be “inspected <u>annually</u> for signs of degradation.” Note 10 to Table XI.M27-1 states that the “testing and inspections can be conducted on a refueling outage interval if plant-specific OE has shown no loss of intended function of the in-scope SSC due to aging effects being managed for the specific component (e.g., loss of material, flow blockage due to fouling).”</p> <p>Enhancement 7 states, “Perform external visual inspections of the elevated water</p>	<p>The NRC staff is seeking clarification on the frequency of the exterior inspections of the water storage tank.</p>

			<p>storage tank consistent with Section 9.2.5.5 of NFPA 25, 2011 Edition at least once every <u>two years</u>.”</p> <p>Please discuss the basis for the 2-year frequency of the external visual inspections of the elevated water storage tank.</p>	
3	A2.16, A6.0, B2.1.16	A-17, A-82, B-123	<p>Table XI.M27-1 of NUREG-2191, Volume 2, recommends that main drain tests follow Section 13.2.5 of NFPA 25. Note 10 to Table XI.M27-1 of NUREG-2191, Volume 2, states, “...testing and inspections can be conducted on a refueling outage interval if plant-specific OE has shown no loss of intended function of the in-scope SSC due to aging effects being managed for the specific component (e.g., loss of material, flow blockage due to fouling).” Section 13.2.5 of NFPA 25 requires “main drain tests to be conducted <u>annually</u> at each water-based fire protection system riser to determine whether there has been a change in the condition of the water supply piping and control valves.” It also states, “When there is a 10 percent reduction in full flow pressure when compared to the <u>original acceptance test or previously performed tests</u>, the cause of the reduction shall be identified and corrected if necessary.”</p> <p>Enhancement 9 states, in part, “Perform main drain testing of the deluge system risers <u>at least once every two years</u>. Main drain testing of deluge systems will be performed consistent with the procedure described in Sections 13.2.5 and A.13.2.5 of</p>	<p>The NRC staff is seeking clarification on the frequency of the main drain testing and the additional tests performed when acceptance criteria not met. The staff is seeking clarification on whether the test-to-test pressure monitoring associated with the periodic main drain testing will be compared to the original acceptance test (or comparable test result) or will only use the immediately prior test results. In addition, the staff is seeking clarification on the basis for not currently performing main drain testing.</p>

		<p>NFPA 25, 2011 Edition. When there is a ten percent reduction in full flow pressure when compared to <u>the original acceptance test or previously performed tests</u>, the cause of the reduction shall be identified and corrected if necessary.” It also states, “If acceptance criteria are not met, at least two additional tests shall be performed <u>within two years</u>.” The NRC staff notes that AMP XI.M27 in GALL-SLR states, “The additional inspections are completed within the interval (i.e., 5 years, annual) in which the original tests were conducted.”</p> <p>It is unclear whether the 10 percent pressure reduction criteria for the test-to-test pressure monitoring will be compared to the original acceptance test (or comparable test results) as provided in NFPA 25. The NRC staff notes that if the test-to-test pressure monitoring only uses the immediately prior test result, significant degradation of the fire water system supply over several years would not be identified while still being less than a 10 percent reduction from the previous test.</p> <p>Section 4.4 of Revision 1 of SLR-ONS-AMPR-XI.M27 states, “Main drain testing consistent with Section 13.2.5 of NFPA 25, 2011 Edition is not currently performed at Oconee.”</p> <p>Please discuss the basis for the 2-year frequency of the main drain testing and the additional tests performed when acceptance</p>	
--	--	--	--

			<p>criteria are not met. Please clarify whether the test-to-test pressure monitoring associated with the periodic main drain testing will be compared to the original acceptance test (or comparable test result) or will only use the immediately prior test results. In addition, please discuss the basis for not currently performing main drain testing.</p>	
4	A2.16, B2.1.16	A-17, B-123	<p>AMP XI.M42 of GALL-SLR, "Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks," states when the fire water storage tank internals are coated, the Fire Water System program and the FSAR Summary Description of the Fire Water System program should be enhanced to include recommendations from XI.M42 on training and qualification of personnel and the "corrective actions" and "acceptance criteria" program elements.</p> <p>SLRA Section A2.16 is the UFSAR Summary Description of the Fire Water System program. Enhancement 10 states that the acceptance criteria and corrective actions for internal inspections of the elevated water storage tank will be in accordance with AMP XI.M42. However, SLRA Section A2.16 does not appear to include the recommendations on training and qualification of personnel. In addition, the NRC staff notes that SLRA Section B2.1.16 and Revision 1 of SLR-ONS-AMPR-XI.M27 do not appear to include the</p>	<p>The NRC staff is seeking clarification on whether the Fire Water System program will include the recommendations on training and qualification of personnel from XI.M42 with regards to managing loss of coating integrity of the internal coating of the elevated water storage tank.</p>

			<p>recommendations on training and qualification of personnel.</p> <p>Please confirm that the Fire Water System program will include the recommendations on training and qualification of personnel from XI.M42 with regards to managing loss of coating integrity of the internal coating of the elevated water storage tank.</p>	
5	A6.0	A-82	<p>The implementation schedule for the Fire Water System program in Table XI-01 of GALL-SLR states, "Program is implemented and inspections or tests begin <u>5 years before the subsequent period of extended operation</u>. Inspections or tests 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."</p> <p>SLRA Table A6.0-1 states, "Program enhancements for SLR will be implemented <u>6 months prior to the SPEO</u>. Inspections or tests that are to be completed prior to SPEO are completed 6 months prior to the SPEO or no later than the last refueling outage prior to the SPEO."</p> <p>Please discuss the basis for implementing the program enhancements 6 months prior to SPEO rather than implementing the program and beginning inspections and tests 5 years before the SPEO.</p>	<p>The NRC staff is seeking clarification on the implementation schedule for the Fire Water System program commitments.</p>

6	B2.1.16	B-123	<p>AMP XI.M27 in GALL-SLR states that results of flow testing, flushes, and wall thickness measurements are monitored and trended.</p> <p>SLRA Section B2.1.16 states, "Flow testing results are reviewed and trended to identify degrading trends prior to loss of system function." Revision 1 of SLR-ONS-AMPR-XI.M27 states that results of flow testing and ultrasonic testing are provided to engineering for evaluation and trending. However, the NRC staff did not identify information related to trending results of flushes.</p> <p>The staff also noted that Section 4.5 in Revision 1 of SLR-ONS-AMPR-XI.M27 states, in part, "Unacceptable results are documented in the Corrective Action for trending..." Given this is different from statements related to trending of flow testing and ultrasonic testing results, it is unclear to the NRC staff if trending of inspection results is performed outside of the corrective action program for instances where results are not entered into the corrective action program.</p> <p>Please clarify whether results of flushes are trended. In addition, please clarify whether inspection results not entered into the corrective action program are trended.</p>	<p>The NRC staff is seeking clarification on whether results of flushes are trended and whether inspection results not entered into the corrective action program are trended.</p>
7	3.3	3-715, 3-736	<p>SLRA Tables 3.3.2-24 and 3.3.2-26 cite AMR items for managing aging effects of fire hydrants exposed to raw water, soil, and air.</p>	<p>The NRC staff is seeking clarification on the applicable environments the fire hydrants are exposed to.</p>

			Please confirm that the fire hydrants in the High Pressure Service Water System and the Keowee Fire Detection/Protection System are not exposed to concrete.	
8	B2.1.16	B-127	<p>Table XI.M27-1 of NUREG-2191, Volume 2, recommends that interior inspections of water storage tanks follow Sections 9.2.6 and 9.2.7 of NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems." Note 4 to Table XI.M27-1 of NUREG-2191, Volume 2, states, "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." However, Enhancement 10 does not state whether vacuum box testing will be conducted.</p> <p>Please clarify whether the elevated water storage tank requires vacuum box testing when pitting, cracks, or loss of material is detected in the immediate vicinity of welds.</p>	The NRC staff is seeking clarification on vacuum box testing of the elevated water storage tank.
9	B2.1.16	B-124	<p>SLRA Section B2.1.16 includes Exception 1 to the "detection of aging effects," related to allowing flow testing at hose connections other than the hydraulically most remote location. Enhancements 1 and 6 are related to flow testing at the hydraulically most remote hose station.</p> <p>Based on the description of Exception 1 and Enhancements 1 and 6, it appears that the intent of the Fire Water System program is to normally perform flow testing of the hydraulically most remote hose connection.</p>	The NRC staff is seeking clarification on when flow testing of other than the hydraulically most remote hose station would be performed.

			If the NRC staff's understanding of the intent is correct, then discuss when flow testing of other than the hydraulically most remote hose station would be performed.	
10	B2.1.16	B-126	<p>Enhancement 3 in SLRA Section B2.1.16 states, "Perform a one-time volumetric wall thickness inspection on a representative sample deluge system supply piping that is periodically subjected to flow during functional testing." The NRC staff did not identify additional details related to the one-time volumetric wall thickness inspection, such as sample size, acceptance criteria, corrective actions, etc. In addition, the staff notes that this one-time volumetric wall thickness inspection is not addressed in the Oconee One-Time Inspection program (SLRA Section B2.1.20).</p> <p>Consistent with AMP XI.M32 in the GALL-SLR, SLRA Section B2.1.20 states that the Oconee One-Time Inspection program includes determination of sample sizes; identification of inspection locations; determination of examination technique, including acceptance criteria; and evaluation of the need for follow-up examinations.</p> <p>The staff is seeking clarification on whether the protocols established in the One-Time Inspection program will be applicable to the one-time volumetric wall thickness inspection on a representative sample deluge system supply piping that is periodically subjected to flow during functional testing.</p>	The NRC staff is seeking clarification on whether the protocols established in the One-Time Inspection program will be applicable to the one-time volumetric wall thickness inspection on a representative sample deluge system supply piping that is periodically subjected to flow during functional testing.

11	2.3.3.4.3	2-148	<p>SLRA Section 2.3.3.4.3 states that the Keowee Fire Detection/Protection System includes hose racks, however, they are not included in SLRA Tables 2.3.3.4-3 and 3.3.2-26. Note 3 to Table 3.1-1, "High Pressure Service Water System," and Note 2 to Table 3.3-1, "Keowee Fire Detection/Protection System," of SLR-ONS-IPAR-M304 points to SLR-ONS-IPAR-S509 for evaluation of hose racks. The NRC staff notes that the SLRA does not indicate whether the High Pressure Service Water System includes hose racks. SLR-ONS-IPAR-S509 does not appear to explicitly address hose racks.</p> <p>Section 3.2.23 of OSS0254.00.00-1002 states hose reels are used at Oconee. However, the SLRA does not include discussion of hose reels.</p> <p>Please clarify whether the High Pressure Service Water System includes hose racks. Please clarify what material(s) the hose racks are and where they are addressed in the SLRA? In addition, discuss whether hose reels are used at Oconee, including what material(s) they are and where they are addressed in the SLRA.</p>	<p>The NRC staff is seeking clarification on hose racks and hose reels.</p>
12	B2.1.16	B-126	<p>SLRA Section B2.1.16 includes 10 enhancements to the Fire Water System. Only Enhancement 5 notes that inspection procedures are being revised.</p> <p>Please clarify existing procedures will be revised or new procedures developed to</p>	<p>The NRC staff is seeking clarification on revised or new procedures related to the enhancements.</p>

			incorporate the enhancements into the program.	
--	--	--	--	--