UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

March 7, 2022

Mr. Brad Berryman
Senior Vice President and Chief Nuclear Officer
Susquehanna Nuclear, LLC
769 Salem Blvd., NUCSB3
Berwick, PA 18603

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1 – POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL - PHASE 2 INSPECTION REPORT 05000387/2022011

Dear Mr. Berryman:

On January 27, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Susquehanna Steam Electric Station, Unit 1 and discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Melvin K. Gray
Digitally signed by Melvin K. Gray
Date: 2022.03.07 14:30:18 -05'00'

Mel Gray, Chief
Engineering Branch 1
Division of Operating Reactor Safety

Docket No. 05000387
License No. NPF-14

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1 – POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL - PHASE 2 INSPECTION REPORT 05000387/2022011 DATED MARCH 7, 2022

DISTRIBUTION:
JGreives, DORS
LCasey, DORS
EGarcia, DORS
CHighley, DORS, SRI
MRossi, DORS, RI
DHochmuth, DORS, AA
LHowell, RI OEDO
RidsNrrPMSusquehanna Resource
RidsNrrDorlLpl1 Resource

DOCUMENT NAME: https://usnrc.sharepoint.com/teams/Region-I-EB1/Inspections/SQ1 License Renewal Phase 2/SQ1 License Renewal Ph 2 IR 2022-011.docx
ADAMS ACCESSION NUMBER: ML22066B013

X SUNSI Review		X Non-Sensitive ☐ Sensitive		X Publicly Available ☐ Non-Publicly Available	
OFFICE	RI/DORS	RI/DORS	RI/DORS		
NAME	NFloyd	JGreives	MGray		
DATE	3/3/22	3/7/22	3/7/22		

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000387
License Number:	NPF-14
Report Number:	05000387/2022011
Enterprise Identifier:	I-2022-011-0010
Licensee:	Susquehanna Nuclear, LLC
Facility:	Susquehanna Steam Electric Station, Unit 1
Location:	769 Salem Blvd., Berwick, PA
Inspection Dates:	January 10, 2022 to January 27, 2022
Inspectors:	N. Floyd, Senior Reactor Inspector J. Kulp, Senior Reactor Inspector N. Mentzer, Reactor Inspector M. Patel, Senior Reactor Inspector J. Schoppy, Senior Reactor Inspector
Approved By:	Mel Gray, Chief Engineering Branch 1 Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a Post-Approval Site Inspection for License Renewal - Phase 2 at Susquehanna Steam Electric Station, Unit 1, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

71003 - Post-Approval Site Inspection for License Renewal

From January 10 to January 27, 2022, the NRC conducted a Post-Approval Site Inspection for License Renewal - Phase 2 at the Susquehanna Steam Electric Station, Unit 1, in accordance with the license renewal inspection program. This inspection took place prior to the period of extended operation (PEO) for Unit 1, which will begin on July 18, 2022. Per IMC 2516, the license renewal inspection program is the process used by NRC staff to verify the adequacy of aging management programs (AMPs), Time Limited Aging Analyses (TLAAs), and other activities associated with an applicant's request to renew an operating license of a commercial nuclear power plant beyond the initial licensing period under 10 CFR Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants."

Post-Approval Site Inspection for License Renewal (4 Samples)

(1) License Conditions and Commitments for License Renewal, Implementation of Aging Management Programs and Time-Limited Aging Analyses

There are a total of 60 regulatory commitments linked to the renewed operating license for Susquehanna Steam Electric Station, Unit 1, issued in November 2009, which include the following: 15 commitments to enhance existing AMPs; 19 commitments to implement new AMPs; 17 commitments to implement existing AMPs; 4 commitments for TLAA activities; and 5 standalone commitments (not associated with an AMP or TLAA). During the inspection, the team reviewed 45 of these commitments (greater than 70%) in order to assess the adequacy and effectiveness of the license renewal program. For each commitment selected, the inspectors reviewed the applicable license renewal program documents, a sample of implementing procedures and records, conducted interviews with licensee staff, and performed walkdowns of structures, systems, and components (SSCs) to verify that the licensee completed the actions necessary to comply with the conditions listed in the renewed facility operating license. For those license renewal action items that were not completed at the time of this inspection, the team verified that there was reasonable assurance that such action items were on track for completion prior to the PEO or in accordance with an established implementation schedule consistent with the license renewal application, the NRC Safety Evaluation Report, and the Updated Final Safety Analysis Report (UFSAR) supplement.

The regulatory commitments selected for the inspection sample are listed below along with the completion status of the item at the time of the inspection. The full description of each commitment is available in the UFSAR supplement for license renewal, as revised, and Appendix A of the NRC Safety Evaluation Report issued as NUREG-1931.

Commitments (by number):

- Commitment #6: Enhance existing BWR CRD Return Line Nozzle Program. Status: Complete.

- Commitment #9: Enhance existing BWR Vessel Internals Program. Status: Complete.

- Commitment #10: Develop and implement new Thermal Aging and Neutron Embrittlement of Cast Austenitic Stainless Steel Program. Status: Complete.

- Commitment #11: Implement existing Flow-Accelerated Corrosion Program. Status: Complete.

- Commitment #12: Enhance existing Bolting Integrity Program. Status: Complete.

- Commitment #13: Enhance existing Piping Corrosion Program. Status: Complete.

- Commitment #16: Develop and implement a new Buried Piping Surveillance Program. Status: Complete.

- Commitment #17: Develop and implement a new one-time Condensate and Refueling Water Storage Tanks Inspection. Status: Complete. The licensee completed the one-time inspections of the tanks within the scope of the program, including ultrasonic testing of one representative tank bottom; however, the NRC inspectors identified instances of cracking and missing grout at the base of the two tanks where they interfaced with their concrete pedestal. The inspectors reviewed past inspection reports and determined these deficiencies were not documented. The inspectors determined this issue was minor because the grout degradation was limited in nature with no signs of adjacent corrosion, the tank pads were designed with a bed of oiled sand to help mitigate corrosion, and the licensee would have likely identified the grout degradation before water intrusion adversely impacted tank integrity using the established walkdown procedures. The issue was entered into the licensee's corrective action program as CR-2022-01517. The inspectors determined the licensee met Commitment 17 and had administrative controls in place to address the issue.

- Commitment #18: Enhance existing Reactor Vessel Surveillance Program. Status: Complete.

- Commitment #19: Develop and implement a new one-time Chemistry Program Effectiveness Inspection. Status: Complete.

- Commitment #20: Develop and implement a new one-time Cooling Units Inspection. Status: Complete.

- Commitment #21: Develop and implement a new one-time Heat Exchanger Inspection. Status: Incomplete, some license renewal action items remained to be completed. Specifically, the control structure chilled water chiller oil cooler and chiller evaporator cooler tubes are scheduled to be cleaned and examined during the week of March 7, 2022 (Work Orders 2282164, 2283839, 2286950 and 2286951). Based on the review of licensee actions completed at the time of this inspection and the administrative controls in place to track the pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment 21.

- Commitment #23: Develop and implement a new one-time Monitoring and Collection System Inspection. Status: Complete.

- Commitment #24: Develop and implement a new one-time Supplemental Piping and Tank Inspection. Status: Incomplete, some license renewal action items remained to be completed. Specifically, the licensee scheduled inspections of five Unit 1 downcomers to be completed during the Spring 2022 refueling outage by April 4, 2022 (Work Order 2283942). Based on the review of licensee actions completed at the time of this inspection and the administrative controls in place to track the pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment 24.

- Commitment #25: Develop and implement a new one-time Selective Leaching Inspection. Status: Incomplete, some license renewal action items remain to be completed. Specifically, the licensee scheduled inspections of the reactor building chilled water lube oil cooler 1S256A for April 22, 2022 (Work Order 2344302) and inspection of the evaporator circulation pump 1P217A for May 4, 2022 (Work Order 2295466) for indications of selective leaching. The inspectors noted the one-time inspections performed to date have identified the presence of selective leaching in plant components categorized at a moderate level, but the licensee did not establish a program or actions to monitor the condition into the PEO. The inspectors observed the licensee plans to review industry guidance on a two-year interval under AR-2021-15992 to determine whether additional actions are needed with a review planned in February 2022. Therefore, Commitment 25 will remain open, is subject to further NRC inspection, and is presented as an observation in the inspection results section of this report.

- Commitment #26: Develop and implement a new Buried Piping and Tanks Inspection Program. Status: Complete.

- Commitment #27: Develop and implement a new one-time Small-Bore Class 1 Piping Inspection. Status: Complete.

- Commitment #28: Enhance existing System Walkdown Program. Status: Complete.

- Commitment #33: Enhance existing Masonry Wall Program. Status: Complete.

- Commitment #34: Enhance the existing Structures Monitoring Program. Status: Incomplete, some license renewal action items remain to be completed. Specifically, the licensee is tracking an action under AR-2022-00621 to complete documentation of license renewal inspections of structures' roofs scheduled to be completed prior to the start of the PEO. Separately, the inspectors determined that an enhancement to the program was not adequately implemented to provide direction for quantifying, monitoring, trending, applying acceptance criteria, and documenting evaluation results. Therefore, Commitment Item 34 will remain open, is subject to further NRC inspection, and is presented as an observation in the inspection results section of this report.

- Commitment #35: Enhance existing RG 1.127 Water-Control Structures Inspection. Status: Incomplete, the inspectors determined that two license renewal enhancements were not adequately implemented related to examining submerged portions of concrete structures and application of acceptance criteria. Therefore, Commitment 35 will remain open, is subject to further NRC inspection, and is presented as an observation in the inspection results section of this report.

- Commitment #36: Develop and implement a new Non-EQ Electrical Cables and Connections Visual Inspection Program. Status: Complete. The licensee completed inspections of the applicable cables and identified eight potential "Adverse Localized Environments" conditions affecting insulated cables. The licensee entered identified issues into their corrective action program; however, the inspectors noted that suggested corrective actions to clean the surface contamination on the cable jackets have not been planned or completed. Currently, one work order is scheduled for June 7, 2022. The inspectors also noted that for the conditions identified, the licensee did not follow the guidance in their procedure NSEP-QA-1130B, Revision 0, to perform the stipulated engineering evaluations. The inspectors determined that the anomalies identified did not have an impact on the cable's insulation or conductor that could have led to a loss of the intended safety function. Both issues were entered into the licensee's corrective action program (CR-2022-00872 and CR-2022-01279). The inspectors determined the licensee met Commitment 36 and had administrative controls in place to address the identified issues.

- Commitment #37: Develop and implement a new Non-EQ Cables and Connections Used in Low-Current Instrumentation Circuits Program. Status: Complete.

- Commitment #38: Develop and implement a new Non-EQ Inaccessible Medium-Voltage Cables Program. Status: Complete.

- Commitment #39: Develop and implement a new Metal-Enclosed Bus Inspection Program. Status: Complete.

- Commitment #40: Develop and implement a new one-time, plant-specific Area-Based NSAS Inspection. Status: Complete.

- Commitment #41: Implement the existing plant-specific Leak Chase Channel Monitoring Activities. Status: Complete.

- Commitment #42: Enhance the existing plant-specific Preventive Maintenance Activities – RCIC/HPCI Turbine Casings. Status: Incomplete, two license renewal action items remain to be completed. Specifically, inspection of high pressure coolant injection turbine casing and evaluation of inspection results is scheduled for U122RIO in April 2022 (RTPM 2337378) and adding the inspection results to NSEP-QA-0446 and the license renewal closure package is scheduled by May 31, 2022 (AR-2022-01499). Based on the review of licensee actions completed at the time of this inspection and the administrative controls in place to track the pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment 42.

- Commitment #43: Enhance the existing Fatigue Monitoring Program. Status: Complete.

- Commitment #44: Enhance the existing Environmental Qualification Program. Status: Complete.

- Commitment #46: Enhance the existing Fire Water System Program. Status: Incomplete, some license renewal action items have not been completed. Specifically, program enhancements were discussed in the fire water system program basis document (NSEP-QA-0441, Revision 0) and the Station Engineering Desktop Guide #7 (NSE-DTG-007, Revision 1) related to completing a representative sample of fire water system piping inspections at a defined periodicity. This activity was to be implemented within the piping corrosion program (NEIM-00-1185, Revision 0). However, in reviewing the piping corrosion program document, the inspectors observed the periodicity of these inspections was not identified to ensure this enhancement was implemented as intended. The licensee entered this issue into their corrective action program as CR-2022-01525 and is scheduled to update the piping corrosion program procedure prior to the start of the PEO. Based on the review of licensee actions completed at the time of this inspection and the administrative controls in place to track the pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment 46.

- Commitment #48: Enhance the existing Lubricating Oil Analysis Program. Status: Complete.

- Commitment #49: Develop and implement a new one-time Lubricating Oil Inspection. Status: Complete.

- Commitment #50: Develop and implement a new Non-EQ Electrical Cable Connections Program. Status: Complete.

- Commitment #51: New P-T Curves (TLAA). Status: Complete.

- Commitment #52: Operating Experience Review at EPU Conditions. Status: Complete.

- Commitment #53: Incorporate FSAR Supplement. Status: Complete.

- Commitment #54: Re-apply for relief request for circumferential vessel shell weld volumetric examinations (TLAA). Status: Complete.

- Commitment #55: Core Plate Hold Down Bolts (TLAA). Status: Complete.

- Commitment #56: Address BWRVIP-76 (TLAA). Status: Complete.

- Commitment #57: Enhance the existing plant-specific Preventative Maintenance Activities – Main Turbine Casing. Status: Complete. Initial license renewal activities for the Unit 1 main turbine casing were completed during the refueling outage in 2020. This involved visual inspection of the accessible surfaces and an ultrasonic examination of selected locations for wall thickness. The inspectors noted that the frequency associated with the main turbine casing inspection activity was changed from 10 years to 14 years without an evaluation to justify this frequency consistent with the preventative maintenance process. The issue was entered into the licensee's corrective action program as CR-2022-01451. The inspectors determined the licensee met Commitment 57 and had administrative controls in place to address the frequency change.

- Commitment #58: Activities in Response to NRC Generic Letter 88-14. Status: Complete.

- Commitment #59: Develop and implement a new Fuse Holders Program. Status: Complete.

- Commitment #60: Activities in Response to NRC Concerns Regarding Fatigue Analyses. Status: Complete.

- Commitment #61: Continue Boral Coupon Testing. Status: Complete.

(2) Newly Identified Structures, Systems, and Components

The team discussed with the licensee's staff their evaluations of newly identified SSCs to determine on a sampling basis compliance with the provisions of 10 CFR 54.37(b). The team reviewed licensee evaluations performed for newly identified structures within the scope of license renewal to verify that the aging management

review was performed in accordance with 10 CFR 54.37. The team also reviewed a list of plant modifications performed from the time the license renewal application was submitted to the time the renewed operating license was issued, to identify any potentially new SSCs that would have been subject to aging management review at the time the NRC was reviewing the license renewal application. Additionally, the team reviewed a sample of licensee procedures to verify that adequate guidance was provided to ensure that SSCs within the scope of 10 CFR 54.37(b) were identified, evaluated, and reported.

(3) Description of Aging Management Programs in the UFSAR Supplement

As part of the review of implementation activities for the selected AMPs, the team reviewed the corresponding UFSAR sections to verify that the program descriptions were consistent with the license renewal application and the corresponding section of the NRC safety evaluation report. The team reviewed three versions of the UFSAR supplement for license renewal as follows:

- The team reviewed the UFSAR supplement submitted with the license renewal application, as revised, to identify the program attributes and future inspection activities that were originally relied upon for the approval of the renewed operating license.
- The team reviewed the revision of the UFSAR submitted to the NRC pursuant to the requirements in 10 CFR 50.71(e)(4) following the issuance of the renewed operating license to verify that the UFSAR supplement for license renewal was included with the UFSAR as required by the condition of the renewed operating license.
- The team reviewed the latest revision of the UFSAR supplement for license renewal (Revision 70) to verify that the program attributes and inspection activities were consistent with the AMPs as originally approved by the NRC and subsequent revisions performed under the provisions of 10 CFR 50.59. The team also verified that any changes caused by the inclusion of newly identified SSCs were included in the UFSAR supplement.

(4) Changes to license renewal commitments and the UFSAR supplement for license renewal

As part of the review of license renewal commitments, AMPs, and TLAAs described in this report, the inspectors reviewed license renewal commitment change documents to verify the licensee followed the guidance in NEI 99-04, “Guidelines for Managing NRC Commitment Changes,” for any change to the commitments, including their elimination. The team verified on a sampling basis that the licensee properly evaluated, reported, and approved where necessary, changes to license renewal commitments listed in the UFSAR in accordance with 10 CFR 50.59.

The team also reviewed the licensee’s procedures for commitment revisions to determine whether the procedure provided for implementing guidance in NEI 99-04 in evaluating, reporting, and approving changes to license renewal commitments listed in the UFSAR in meet the requirements of 10 CFR 50.59.

The renewed operating license for Susquehanna Steam Electric Station, Unit 1, Condition 2.J, states in part that the information in the UFSAR supplement submitted with the license renewal application shall be incorporated into the UFSAR which will

be updated in accordance to 10 CFR 50.71(e). Following incorporation into the UFSAR, the need for prior NRC approval of any changes will be governed by 10 CFR 50.59. The team verified on a sampling basis that the licensee made changes to the UFSAR in accordance with 10 CFR 50.59.

INSPECTION RESULTS

Observation: Selective leaching one-time inspection results (Commitment 25)	71003

The Selective Leaching Inspection Program is a new one-time inspection to detect and characterize the conditions on internal and external surfaces of susceptible components including piping, valve bodies, pump casings, heat exchanger components, hydrants, level gauges, and orifices. The inspection provides direct evidence through a combination of visual examination and hardness testing of whether, and to what extent, a loss of material due to selective leaching has occurred or is likely to occur that could result in a loss of intended function. The components within the scope of this program are located in 26 different plant systems and are constructed from cast iron, brass, bronze, and copper alloy materials.

The inspectors determined the licensee completed 107 of 111 planned one-time inspections between 2018 and 2021 and scheduled the four remaining inspections to be completed in April and May 2022. Most of these inspections consisted of non-destructive visual inspections of the surface condition using picking and hardness tests, and three components were sent to an independent laboratory for destructive testing. Selective leaching was identified in 12 cast iron components (10 in the fire protection system exposed to raw water and 2 in the reactor building chilled water system exposed to river water environment). Each of these components was evaluated by licensee staff for the relative impact of the selective leaching and was determined to not affect the function through the PEO. The licensee concluded that an ongoing program was not needed to monitor this aging mechanism into the PEO. The licensee established an action under AR-2021-15992 to periodically re-evaluate the need for a selective leaching program based on a review of regulatory initiatives, industry best practices, operating experience, and advances in selective leaching identification through advances in non-destructive testing technologies. This periodic re-evaluation was established to be conducted on a two-year frequency with a current due date of February 18, 2022.

The NRC inspectors reviewed the one-time inspection program basis (NSEP-AD-0447, Revision 3) and inspection results from a variety of material and environment combinations. The inspectors noted that all the components with selective leaching were identified through internal surface examinations (except for one component that was only destructively tested) and that the scope of internal examinations for cast iron components was limited compared to the total population of completed examinations. The inspectors also noted that only two cast iron components were destructively tested. Both components were identified as having selective leaching present with one having a degradation rate doubled in comparison to the estimated rate using non-destructive inspection techniques. Given this limited internal examination sampling, the inspectors concluded there is uncertainty regarding the condition of similar age cast iron components exposed to the same environment. The inspectors noted the licensee plans to review industry and regulatory guidance on a two-year frequency to determine whether additional actions are needed; however, the inspectors determined this action to consider additional actions did not address this degradation mechanism identified as active at the plant. Therefore, Commitment 25 will remain open and is subject to further NRC inspection to verify the regulatory commitment is implemented as described in the safety evaluation report for license renewal.

Observation: Implementation of the Structures Monitoring Program (Commitment 34)	71003

The Structures Monitoring Program is an existing program intended to ensure that age-related degradation of plant structures and structural components is managed so that each structure or structural component retains the ability to perform its intended safety function. Commitment 34 credited the existing program with nine enhancements to be implemented prior to the PEO. One enhancement stated, in part, to include additional direction for quantifying, monitoring, and trending of inspection results as well as documenting those inspection results. The enhancement further required specifying acceptance criteria to monitor degradation and to trigger the initiation of corrective actions.

This enhancement was part of an amendment to the License Renewal Application that was submitted to the NRC in letter PLA-6427, dated September 23, 2008 (ADAMS Accession Number ML083030165), to address program deficiencies identified by NRC staff. As documented in the NRC license renewal inspection report 2008-007 (ML090580211, pages 11-13), the NRC staff identified that the existing program did not meet the guidance in Generic Aging Lessons Learned Report (NUREG-1801, Revision 1), Section XI.S6, Structures Monitoring Program, in the elements of monitoring and trending, acceptance criteria, and detection of aging effects. An example of one program deficiency was that the acceptability of the observed condition was left to individual judgment of the inspector/examiner and creating potentially inconsistent observation/judgment by different inspectors/examiners at different times.

The NRC inspectors reviewed the Structures Monitoring Program procedure (NDAP-QA-1163, Revision 8) and a sample of structure specific procedures and inspection results to verify the implementation of the enhancements for Commitment 34. Specifically, the inspectors reviewed the procedures and inspection results for the following:

- Condensate and Refueling Water Storage Tank Retention Basin (NEPM-QA-1208, Revision 1 and EC-STRU-2075, Revision 4)
- ESSW Pumphouse/Spraypond (NEPM-QA-1205, Revision 1; EC-STRU-2031, Revision 3; and EC-STRU-2076, Revision 3)
- Diesel Generator Buildings A-D (NEPM-QA-1203, Revision 0 and EC-STRU-2018, Revision 4)

The inspectors noted that the Structures Monitoring Program procedures relied specifically on the responsible program engineer to determine the level of inspection, documentation, monitoring, trending, and corrective actions. The inspectors also noted that the inspection results reviewed did not include quantitative data or evaluations which could be used for monitoring and trending issues or to justify continued acceptability of conditions to the next scheduled structural examination. Based on this sample of procedures and inspection results, the inspectors determined that the licensee did not complete the enhancement under the license renewal commitment. Therefore, Commitment 34 will remain open and is subject to further NRC inspection to verify the regulatory commitment is implemented as described in the safety evaluation report for license renewal.

Observation: Implementation of the Water Control Structures Program (Commitment 35)	71003

The RG 1.127 Water-Control Structures Inspection is an existing program consisting of inspection and surveillance activities to detect age-related degradation of the spraypond, engineered safeguards service water (ESSW) pumphouse, and the earthen embankments

along the spraypond. Commitment 35 credited the existing program with three enhancements to be implemented prior to the PEO. The three enhancements are:

1. Add the spraypond (including concrete liner, emergency spillway, riser encasements and earthen embankments) to its scope for inspection.
2. Include RG 1.127, Revision 1, Section C.2 inspection elements and degradation mechanisms for water-control structure inspection.
3. Include acceptance criteria as delineated in NUREG-1801, Revision 1, Section XI.S7 for water-control structures. Evaluation criteria provided in Chapter 5 of ACI 349.3R-96 provides acceptance criteria (including quantitative criteria) for determining the adequacy of observed aging effects and specifies criteria for further evaluation.

The NRC inspectors reviewed the implementation of this commitment as incorporated in the structure-specific procedure NEPM-QA-1205, ESSW Pumphouse/Spraypond – Structures Monitoring Program, Revision 1, and reviewed a sample of structural inspection results for the water-control structures. The inspectors observed the following program deficiencies:

- While the spraypond was added to the scope of the program, the licensee did not perform inspections of the submerged portions of the concrete liner. Procedure NEPM-QA-1205, Section 5 states to "perform a visual inspection of accessible areas during periodic inspections" but does not provide a definition of accessible. Inspection results are then recorded in calculations EC-STRU-2076, "Structural Monitoring Program Inspections of Spray Pond," and EC-STRU-2031, "Structural Monitoring Program Inspections of ESSW Pumphouse." The inspectors reviewed EC-STRU-2076, Revision 3, and noted that in the documentation of the 2010, 2015, and 2020 inspections, areas of the spraypond concrete liner submerged by more than one foot of water were obscured and not inspected. During interviews with engineering staff, the licensee stated that they had traditionally considered the concrete liner submerged with greater than one foot of water as being inaccessible for the purposes of the Structures Monitoring Program. The inspectors observed the 2010 and 2015 inspections referenced condition reports generated by divers performing unrelated annual mollusk inspections which identified concrete conditions involving spalling or cracks underwater incidentally observed during their activities. The inspectors also observed the licensee completed periodic underwater assessment of pond sediment.

- The inspectors reviewed EC-STRU-2031, Revision 3, and noted that in the documentation for the 2011 and 2016 inspections, the submerged pump intake and weir discharge chambers were not inspected. The pump intake and weir discharge chambers are designated "Critical Structural Components" in NEPM-QA-1205, Attachment 3 and are the submerged portions of the ESSW pumphouse structure.

- The inspectors determined the enhancement to include specific acceptance and evaluation criteria was not implemented. Procedure, NEPM-QA-1205, Section 5.1.1(b)(i) provided the direction for monitoring, reporting, collecting data, and documenting structural degradation observed during periodic inspections. This step referred to NDAP-QA-1163, Structures Monitoring Program, Attachment C, "Component/Commodity Aging Effect Guidelines," for acceptance criteria and NEPM-QA-1205, Attachment F, "ACI 349.3R-13 Section 5," for further guidance when dispositioning structural degradation. The NRC inspectors reviewed these implementing procedures and noted that the acceptance criteria in Attachment C of NDAP-QA-1163 were identified for "guidance only" and that the responsible program engineer made the decision on whether a structural deficiency was documented, re-

inspected, and/or repaired. This differed from the enhancement to include the evaluation and acceptance criteria from ACI-349.3R which provides specific criteria for dispositioning conditions observed during an inspection. The inspectors also performed independent walkdowns of the water control structures and compared the conditions to the results from licensee's periodic inspections. The inspectors noted that the licensee did not document in detail nor provide an evaluation for instances of observed, above water liner spalling or cracks that appeared to exceed applicable criteria. Notwithstanding, these conditions did not appear to have a structural impact.

Based on the review of the procedures and inspection results, the inspectors determined that the licensee did not complete two of the enhancements under the license renewal commitment. Therefore, Commitment 35 will remain open and is subject to further NRC inspection to verify the regulatory commitment is implemented as described in the safety evaluation report for license renewal.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On January 27, 2022, the inspectors presented the Post-Approval Site Inspection for License Renewal - Phase 2 results to Mr. Brad Berryman and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71003	Calculations	EC-062-2101	Unit 1 Fatigue Monitoring Update for Startup through 3/31/2020	Revision 0
	Corrective Action Documents	AR-2017-20465 AR-2018-01861 AR-2021-13042 CR-1609310 CR-1635348 CR-1636187 CR-1664285 CR-2014-18945 CR-2016-24554 CR-2016-24683 CR-2017-10847 CR-2018-08579 CR-2018-15602 CR-2019-01063 CR-2019-06944 CR-2019-12410 CR-2019-12457 CR-2019-13788 CR-2019-14074 CR-2019-14537 CR-2020-06133 CR-2020-07733 CR-2020-10994 CR-2020-13246 CR-2021-00406 CR-2021-01475 CR-2021-04756 CR-2021-17784		
	Corrective Action Documents	AR-2022-00621 AR-2022-00876		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Resulting from Inspection	AR-2022-01489 AR-2022-01515 CR-2022-00761 CR-2022-00810 CR-2022-00839 CR-2022-00856 CR-2022-00879 CR-2022-00937 CR-2022-00959 CR-2022-01145 CR-2022-01184 CR-2022-01267 CR-2022-01520 CR-2022-01527 CR-2022-01551 CR-2022-01594 CR-2022-01935 CR-2022-01936 CR-2022-01937 CR-2022-01938		
	Drawings	C-1008	Refueling and Unit 1 Condensate Tanks - Plan	Revision 8
		HBD-3028-1	Isometric - ESSW Pumphouse Emergency Service Water	Revision 2
		SPHHBD3030-1	Drains from 30" HBD3028 3029 & 3030	Revision 2
	Engineering Changes	EC-2182962	Delete the Loop B ESW Guard Pipe Drain VLV 011018 and Repair Penetration X-56-1-40	Revision 0
	Engineering Evaluations	EC 2352522	ESW & RHRSW Pump Bolting	Revision 0
		LDCN 5484	License Renewal, Newly Identified Aging Management SSC, Backup Fire Protection System	09/23/2019
		LDCN 5560	Change to License Renewal Regulatory Commitment 55 and other editorial changes	07/23/2020
		LDCN 5593	Changes due to ASME Boiler and Pressure Code, Section XI, Division 1 changes	12/02/2020
		LDCN 5594	Change to License Renewal Regulatory Commitment 48	12/10/2020
		LDCN 5649	Revise FSAR Section 3.14.2.50 to Remove Excessive Detail	08/11/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous	C1034	Nuclear Engineering Specification for Structural Excavation	Revision 6
		License Renewal Closure Package (LRCP)-06	AMP 06 – BWR CRD Return Line Nozzle Program	06/22/2020
		LRCP-09	AMP 09 – BWR Vessel Internals Program	04/16/2020
		LRCP-10	AMP 10 – Thermal Aging and Neutron Embrittlement of CASS Program	10/01/2020
		LRCP-11	AMP 11 – Flow-Accelerated Corrosion Program	02/04/2020
		LRCP-12	AMP 12 – Bolting integrity Program	05/19/2020
		LRCP-13	AMP 13 – Piping Corrosion Program	10/20/2020
		LRCP-16	AMP 16 – Buried Piping Surveillance Program	07/23/2020
		LRCP-17	AMP 17 – Condensate and Refueling Water Storage Tanks Inspection	02/19/2020
		LRCP-18	AMP 18 – Reactor Vessel Surveillance Program	09/08/2020
		LRCP-19	AMP 19 – Chemistry Program Effectiveness Inspection	08/20/2020
		LRCP-20	AMP 20 – Cooling Units Inspection	05/11/2021
		LRCP-21	AMP 21 – Heat Exchanger Inspection	Draft
		LRCP-23	AMP 23 – Monitoring and Collection System Inspection	04/22/2020
		LRCP-24	AMP 24 – Supplemental Piping/Tank Inspection	Draft
		LRCP-25	AMP 25 – Selective Leaching Inspection	Draft
		LRCP-26	AMP 26 – Buried Piping and Tanks Inspection Program	08/19/2020
		LRCP-27	AMP 27 – Small Bore Class 1 Piping Inspection	01/31/2020
		LRCP-28	AMP 28 – System Walkdown Program	10/20/2020
		LRCP-33	AMP 33 – Masonry Wall Program	01/10/2022
		LRCP-34	AMP 34 – Structures Monitoring Program	10/25/2021
		LRCP-35	AMP 35 – RG 1.127 Water-Control Structures Inspection	09/09/2021
		LRCP-36	AMP 36 – Non-EQ Electrical Cables /Connections Visual Inspection Program	07/16/2020
		LRCP-37	AMP 37 – Non-EQ Cables & Connections Used in Low-Current Instrumentation Circuits Program	07/29/2020
		LRCP-38	AMP 38 – Non-EQ Inaccessible Medium-Voltage Cables Program	01/25/2021
		LRCP-39	AMP 39 – Metal-Enclosed Bus Inspection Program	07/20/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		LRCP-40	AMP 40 – Area-Based NSAS Inspection	05/20/2020
		LRCP-41	AMP 41 – Leak Chase Channel Monitoring Activities	03/24/2020
		LRCP-42	AMP 42 – Preventive Maintenance Activities - RCIC/HPCI Turbine Casings	Draft
		LRCP-43 & 60	AMP 43 – Fatigue Monitoring Program and AMP 60 – Activities in Response to NRC Concerns Regarding Fatigue Analyses	06/03/2021
		LRCP-44	AMP 44 – Environmental Qualification (EQ) Program	03/17/2020
		LRCP-46	AMP 46 – Fire Water System Program	04/28/2020
		LRCP-48	AMP 48 – Lubricating Oil Analysis Program	01/04/2021
		LRCP-49	AMP 49 – Lubricating Oil Inspection	08/16/2021
		LRCP-50	AMP 50 – Non-EQ Electrical Cables and Connections Program	11/02/2021
		LRCP-51	AMP 51 – New P-T Curves	08/26/2020
		LRCP-52	AMP 52 – OE Review at EPU Conditions	02/12/2020
		LRCP-55	AMP 55 – Core Plate Hold Down Bolts	09/09/2020
		LRCP-56	AMP 56 – BWRVIP-76	05/04/2020
		LRCP-57	AMP 57 – Preventive Maintenance Activities - Main Turbine Casings	12/20/2021
		LRCP-58	AMP 58 – Activities in Response to NRC Generic Letter 88-14	07/20/2020
		LRCP-59	AMP 59 – Fuse Holders Program	05/18/2020
		LRCP-61	AMP 61 – Boral Coupon Testing	05/05/2020
	Procedures	CH-TP-021	SOER 88-01 Instrument Air Sampling	Revision 7
		LS-115	Operating Experience Program	Revision 3
		LS-125	Corrective Action Program	Revision 13
		MI-AD-046	Predictive Maintenance (PDM) Process	Revision 6
		MI-PD-002	Thermography Program	Revision 9
		MI-PD-003	Lube Oil Analysis Program	Revision 10
		MT-GE-009	Insulation Resistance Testing	Revision 27
		MT-GM-015	Torquing Guidelines	Revision 36
		NDAP-QA-0411	License Renewal Program Implementation	Revision 2
		NDAP-QA-0750	Regulatory Commitment Management	Revision 11

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		NSE-DTG-002	Station Engineering Desktop Guide #2, System Walkdowns and Documentation	Revision 6
		NSEP-QA-0002	License Renewal System Walkdown Program	Revision 0
		OPS-1	Operational Quality Assurance Program	Revision 17
		SH-179-003	24 Month Radiation Source Check of the Containment Monitoring System Channels 15720A and 15720B	Revision 17
	Self-Assessments	DI-2019-07234	NRC IP71003 Pre-PEO License Renewal Inspection Focused Area Self-Assessment	11/07/2019
		DI-2021-01284	Readiness for NRC License Renewal Inspection	07/19/2021
	Work Orders	1320738 1515161 1620111 1660585 1734382 1759375 1791189 1855709 1887245 1905456 1915922 1922789 1934512 1964792 1966940 2005473 2018886 2036768 2038333 2038970 2058330 2071051 2090298 2091051 2093734		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		2093944 2097200 2104082 2128103 2128104 2133022 2146955 2161797 2163686 2167663 2179139 2180611 2180612 2180613 2180614 2182689 2200672 2201097 2201098 2213855 2213858 2216769 2216771 2265692 2265930 2267552 2268692 2268733 2274517 2278661 2278884 2287104 2318387 2329179		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		2339139 2381634 2382417 2394030 2401992		