



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
475 ALLENDALE RD, STE 102
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

August 1, 2022

Mr. David P. Rhoades
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer (CNO)
Constellation Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – INTEGRATED
INSPECTION REPORT 05000352/2022002 AND 05000353/2022002

Dear David Rhoades:

On June 30, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Limerick Generating Station, Units 1 and 2. On July 26, 2022, the NRC inspectors discussed the results of this inspection with Matthew Bonanno, Plant Manager, 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,

Jonathan E. Greives, Chief
Projects Branch 4
Division of Operating Reactor Safety

Docket Nos. 05000352 and 05000353
License Nos. NPF-39 and NPF-85

Enclosure:
As stated

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SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 – INTEGRATED
 INSPECTION REPORT 05000352/2022002 AND 05000353/2022002 DATED
 AUGUST 1, 2022

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000352 and 05000353

License Numbers: NPF-39 and NPF-85

Report Numbers: 05000352/2022002 and 05000353/2022002

Enterprise Identifier: I-2022-002-0035

Licensee: Constellation Energy Generation, LLC

Facility: Limerick Generating Station, Units 1 and 2

Location: Sanatoga, PA 19464

Inspection Dates: April 1, 2022 to June 30, 2022

Inspectors: D. Beacon, Senior Resident Inspector
N. Floyd, Senior Reactor Inspector
E. Garcia, Resident Inspector
L. Grimes, Resident Inspector
M. Henrion, Senior Health Physicist
A. Ziedonis, Senior Resident Inspector

Approved By: Jonathan E. Greives, Chief
Projects Branch 4
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Limerick Generating Station, Units 1 and 2, 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.

PLANT STATUS

Unit 1 began the inspection period at rated thermal power. On April 3, 2022, the unit was shutdown for a planned refueling outage. The unit was returned to full power on April 24, 2022. On April 27, 2022, power was reduced to approximately 18 percent rated thermal power due to turbine control valve oscillations. The unit was returned to full power on April 30, 2022. On May 13, 2022, the unit was shutdown for a maintenance outage to replace the 'B' recirculation pump seal after station personnel identified a degrading trend in second stage recirculation pump seal pressure. The unit was returned to full power on May 18, 2022, and remained at or near rated thermal power for the remainder of the inspection period.

Unit 2 began the inspection period at rated thermal power and remained at or near rated thermal power for the entire inspection period.

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 performed activities described in IMC 2515, Appendix D, "Plant Status," observed risk significant activities, and completed on-site portions of IPs. 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.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated Constellation's readiness for seasonal extreme hot weather conditions during the week of June 6, 2022

External Flooding Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment were consistent with Constellation's design requirements and risk analysis assumptions for coping with external flooding during the week of June 6, 2022

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 1 main steam line during and following drywell entry during refueling outage on April 12, 2022
- (2) Unit 1 circulating water system following extent of condition pipe repairs inside the condenser bay on April 15 and 28, 2022
- (3) Unit 1 'C' residual heat removal (RHR) subsystem during and following venting activities on April 25 and May 2, 2022
- (4) Unit 2 D22, D23, and D24 emergency diesel generators (EDGs) during D21 EDG planned system outage window on June 10 and 13, 2022

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the Unit common 'B' emergency service water (ESW) system following a maintenance window the week of June 27, 2022

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 2 fire area 54, Unit 2 'A' and 'C' RHR heat exchanger and pump rooms 173 and 280 on May 12, 2022
- (2) Unit 2 fire area 23, Unit 2 cable spreading room on May 24, 2022
- (3) Unit 1 fire area 20, Unit 1 static inverter room 452 on May 25, 2022
- (4) Unit 2 fire area 18, Unit 2 D23 emergency 4KV switchgear room 428 on June 7, 2022
- (5) Unit 2 fire area 85, Unit 2 D22 EDG and fuel oil-lube oil tank room, rooms 315B and 316B on June 10, 2022

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the onsite fire brigade training and performance during an unannounced fire drill on May 23, 2022

71111.08G - Inservice Inspection Activities (BWR)

BWR Inservice Inspection Activities Sample - Nondestructive Examination and Welding Activities (IP Section 03.01) (1 Sample)

- (1) The inspectors verified that the reactor coolant system boundary, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation and that repairs and replacements were appropriately fabricated, examined and accepted by reviewing the following activities from April 11 to April 22, 2022:

03.01.a - Nondestructive Examination and Welding Activities

- Manual phased array ultrasonic testing of the N1A reactor recirculation nozzle to safe-end dissimilar metal weld, VRR-1RS-1A (NDE Report Li1R19-VEN-

- 003). This examination was performed in accordance with BWRVIP-75-A, "Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules"
- Automated ultrasonic testing of the reactor core shroud horizontal and vertical welds, H1 – H7 and V7–8/15–18/25–26 (NDE Reports CNF-SHRD-02 through -05). This examination was performed in accordance with BWRVIP-76, Revision 1-A, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines"
 - Manual ultrasonic testing of the RHR system pipe to elbow weld, RHA 005 (NDE Report Li1R19-UT-032)
 - General visual examinations of the containment, including accessible portions of the drywell and suppression pool surfaces (Work Orders (WOs) 05170336 and 05145218)
 - Visual examinations of the in-vessel visual inspections, including a sample of the jet pumps, core spray (CS) and feedwater piping and spargers, and top guides (WO 05178061)
 - Welding activities associated with the replacement of the 'C' RHR pump suction pressure relief valve, PSV-051-1F030C, under WO 05075540. This included liquid penetrant testing of four welds, W303, W401, W701, and W1001 (NDE Report BOP-PT-22-013)
 - Flaw evaluation of the embedded reflector identified during the Spring 2020 refueling outage (1R18) using automated phased array ultrasonic testing on the N5A CS injection nozzle to safe-end dissimilar metal weld (NDE Report LIM-1-601990). The flaw was determined to be acceptable for continued serviced. Planned successive examination requirements were discussed between Constellation and NRC staff in a meeting available for public observation on March 31, 2022 (ML22086A006)

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during a Unit 1 reactor cavity drain-down on April 19, 2022, and reactor startup on April 22, 2022

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a licensed operator annual requalification exam scenario in the simulator on June 27, 2022

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Unit 1 main steam isolation valve (MSIV) maintenance effectiveness in response to leak rate testing failures on April 6, 7, 8, and 16, 2022

Quality Control (IP Section 03.02) (1 Sample)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

- (1) Unit 1 'B' recirculation pump seal replacement following second stage degradation and monitoring on May 5, 6, and 14, 2022

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Unit 1 risk assessment for inoperable equipment during mode changes pursuant to Technical Specification (TS) 3.0.4b on April 22, 23, and 25, 2022
- (2) Unit 1 risk informed completion time implementation associated with inoperable instrumentation channels during turbine control valve #1 closure on April 27, 2022
- (3) Unit 1 'C' RHR emergent work in response to receipt of high discharge pressure and low-pressure coolant injection (LPCI) differential pressure permissive alarms on May 5, 6, and 11, 2022
- (4) Unit 1 bypass valve #1 emergent work in response to a leak on May 15 and 16, 2022
- (5) Unit 2 during planned maintenance on the '2B' CS system and the 'B' ESW system on June 21 and 22, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Unit 1 'B' outboard MSIV following leak rate testing on April 5, 2022
- (2) Unit common RHR service water and ESW 'A' return piping to the spray pond following the identification of low wall thickness on April 15, 2022
- (3) Unit 1 safety relief valve (SRV) tailpipe temperature data monitoring during plant heat-up during the week of April 25, 2022
- (4) Unit 1 'D' SRV lowering pilot stage temperature on June 2 and 3, 2022
- (5) Unit 2 average power range monitor 4 following aborted surveillance test after peak voltage and frequency found out of tolerance on June 15 and 22, 2022

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 1 'C' RHR outboard LPCI valve engineering change to support manually increasing the seating thrust on May 18 and 19, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (7 Samples)

The inspectors evaluated the following post-maintenance testing activities to verify system operability and/or functionality:

- (1) Unit 1 'B' and 'D' in-board MSIV local leak rate tests following corrective maintenance on April 14, 2022
- (2) Unit 1 'A' in-board, 'B' out-board, and 'C' out-board MSIV stroke timing following corrective maintenance on April 14 and 19, 2022
- (3) Unit 1 'C' RHR system minimum flow valve hand switch following replacement on April 27, 2022
- (4) Unit 2 hardened containment vent system battery cells following replacement on May 6 and 18, 2022
- (5) Unit 1 reactor core isolation cooling (RCIC) pump inboard discharge valve stroke on May 16 and 17, 2022
- (6) Unit 1 LPCI outboard injection valve stroke on May 16 and 17, 2022
- (7) Unit 1 bypass valve #1 valve stroke on May 17, 2022

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (2 Samples)

- (1) The inspectors evaluated Unit 1 refueling outage (1R19) activities from April 4, 2022, through April 23, 2022
- (2) The inspectors evaluated Unit 1 maintenance outage (1M58) activities from May 14, 2022, through May 18, 2022

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance testing activities to verify system operability and/or functionality:

Surveillance Tests (other) (IP Section 03.01) (5 Samples)

- (1) ST-6-041-202-1, Unit 1 MSIV cold shutdown valve testing on April 4, 2022
- (2) ST-6-092-115-1, Unit 1 D11 EDG loss-of-coolant-accident / loss-of-off-site-power testing on April 15, 2022
- (3) ST-4-041-210-1, Unit 1 main steam relief valve test on April 28 and 29, 2022

- (4) ST-6-049-200-1, Unit 1 RCIC valve test on June 16 and 17, 2022
- (5) ST-6-092-318-2, Unit 2 D24 EDG fast start test run on June 21, 2022

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) ST-6-055-230-1, Unit 1 high-pressure coolant injection quarterly pump, valve and flow in-service testing on May 3, 2022

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) ST-4-LLR-031/041/051/061-1, Unit 1 main steam line A/B/C/D local leak rate testing on April 5, 2022

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated a simulator training drill on June 13, 2022

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated how the licensee identifies the magnitude and extent of radiation levels and the concentrations and quantities of radioactive materials and how the licensee assesses radiological hazards

Instructions to Workers (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated how the licensee instructs workers on plant-related radiological hazards and the radiation protection requirements intended to protect workers from those hazards

Contamination and Radioactive Material Control (IP Section 03.03) (3 Samples)

The inspectors observed/evaluated the following licensee processes for monitoring and controlling contamination and radioactive material:

- (1) Licensee surveys of potentially contaminated material leaving the Unit 1 drywell during a refueling outage
- (2) Observed worker protective clothing practices for Unit 1 drywell, suppression pool, and refueling floor entry and exit during refueling outage
- (3) Observed surveying of potentially contaminated material leaving the radiological controlled area through small article monitors and frisking by hand

Radiological Hazards Control and Work Coverage (IP Section 03.04) (5 Samples)

The inspectors evaluated the licensee's control of radiological hazards for the following radiological work:

- (1) Radiation Work Permit LG-0-22-00502
- (2) Radiation Work Permit LG-0-22-00512
- (3) Radiation Work Permit LG-0-22-00711
- (4) Radiation Work Permit LG-0-22-00901
- (5) Radiation Work Permit LG-0-22-00902

High Radiation Area and Very High Radiation Area Controls (IP Section 03.05) (5 Samples)

The inspectors evaluated licensee controls of the following High Radiation Areas and Very High Radiation Areas:

- (1) Unit 1 Suppression Pool Leakage Tank Room
- (2) Unit 1 Drywell
- (3) Unit 1 Control Rod Drive Repair and Storage Area - 253' Elevation Room 403
- (4) Under Unit 1 Reactor Pressure Vessel Head on Common Refuel Floor - 352' Elevation
- (5) Unit 1 Suppression Pool Water from Floating Step-off Diver Platform

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 03.06) (1 Sample)

- (1) The inspectors evaluated radiation worker and radiation protection technician performance as it pertains to radiation protection requirements

71124.08 - Radioactive Solid Waste Processing & Radioactive Material Handling, Storage, & Transportation

Shipment Preparation (IP Section 03.04) (1 Sample)

- (1) The inspectors observed the preparation of radioactive shipment MM-22-034.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

- (1) Unit 1 SSFFs for the period of April 1, 2021 through March 31, 2022
- (2) Unit 2 SSFFs for the period of April 1, 2021 through March 31, 2022

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

- (1) Unit 1 emergency alternating current power systems for the period of April 1, 2021 through March 31, 2022

- (2) Unit 2 emergency alternating current power systems for the period of April 1, 2021 through March 31, 2022

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program (CAP) related to the following issues:

- (1) Evaluation and corrective actions associated with Unit 2 RCIC system trip latch identified by the NRC with minimal engagement, and associated work group evaluation (WGE) 4472545-04 on May 12, 26, and 27, 2022
- (2) Evaluation and corrective actions associated with a below allowable minimum wall thickness condition identified on the 'A' RHR and ESW return piping header to the spray pond on May 11, 25, and 26, 2022

71152S - Semiannual Trend Problem Identification and Resolution

Semiannual Trend Review (Section 03.02) (1 Sample)

- (1) The inspectors reviewed the licensee's CAP for potential adverse trends in reactor building floor drain blockage that might be indicative of a more significant safety issue.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

71003 - Post-Approval Site Inspection for License Renewal

Post-Approval Site Inspection for License Renewal (1 Sample)

- (1) The inspectors conducted a Phase 1 license renewal inspection at Unit 1 from April 11 to April 22, 2022. The following aging management programs and associated commitments were evaluated by the inspectors:
 - Open-Cycle Cooling Water System (Commitment 12)
 - Ultrasonic testing thickness examinations of service water piping on lines JBD-102 and JBD-124 (WO 05045408)
 - Remote visual examinations of coating condition inside the circulating water piping between the cooling tower and circulating water pumphouse (WO 05086797)
 - One Time Inspection (Commitment 22)
 - Ultrasonic testing shear wave examinations of feedwater piping on line DCD-109 in the condenser bay (WO 04171304)
 - ASME Section XI, Subsection IWE (Commitment 30)
 - Visual examinations of drywell and suppression pool liner condition (WOs 05029322 and 05145218)

- Corrosion monitoring using pit depth measurements and ultrasonic testing thickness exams of the suppression pool metal liner (WO 05075724)
- Protective Coating Monitoring and Maintenance Program (Commitment 37)
 - Recorded video of suppression pool diving activities, including recoating activities in underwater portions of the liner (WO 05145218)
- Fuse Holders (Commitment 42)
 - Fuse clip resistance measurements of the drywell unit cooler drain flow elements and transmitters (WO 05045639)

INSPECTION RESULTS

Minor Violation	71152A
<p>Minor Violation: Constellation maintenance procedure M-50-005, "RCIC Turbine Trip Throttle Valve Overhaul HV-50-112/212," Revision 3, step 5.3.34, directs verification of complete engagement of the latch-up lever and trip hook during trip throttle valve reassembly. On January 18, 2022, NRC inspectors identified the Unit 2 RCIC latch-up level and trip hook with minimal engagement, and questioned Constellation operators regarding RCIC operability. Constellation documented the condition in IR 4472545, completed an immediate determination of operability on January 18, successfully performed a RCIC surveillance test on January 19, and performed planned corrective maintenance on January 21 to restore full engagement. Constellation operators also inspected the extent of condition on the Unit 1 RCIC system and determined there was more engagement than on Unit 2, but less than complete, and wrote IR 4474396 to consider for future corrective maintenance. NRC inspectors also questioned operators on the procedure inspection criteria, and Constellation wrote IR 4472586 to consider procedure changes to clarify inspection criteria for proper system alignment following reset of a RCIC turbine trip by operations department personnel.</p> <p>Constellation performed a WGE under IR 4472545-04 to evaluate the cause of the as-found minimal engagement, and determined that there was unclear procedure guidance in M-050-005, with no measurable acceptance criteria for engagement during the reassembly phase. Constellation performed industry benchmarking and created WGE assignments to revise maintenance procedures and communicate the issue throughout the fleet. Constellation also created assignments in IR 4474396 to revise operations procedures to clarify inspection criteria following reset from a RCIC turbine trip.</p> <p>The inspectors observed the RCIC surveillance test on January 19, observed the entire corrective maintenance evolution on January 21, and reviewed the WGE. The inspectors discussed the corrective maintenance activities with the licensee's subject matter expert on January 21. The inspectors noted during corrective maintenance that Constellation identified the return spring nuts were excessively tightened at the turbine trip throttle valve location on the trip linkage assembly, thereby limiting the allowable travel of the trip hook and preventing complete engagement with the latch-up lever. Constellation documented the return spring adjustment under the corrective maintenance completion notes in WO 5223698-01. Additionally, the inspectors noted that following the RCIC surveillance test on January 19, operators tripped the RCIC turbine and performed a reset in accordance with the surveillance test procedure, and the engagement of the latch-up level and trip hook did not improve from prior to performance of the surveillance test. Although the inspectors did not disagree with</p>	

Constellation’s conclusion in WGE that the maintenance procedure warranted further clarity, the inspectors ultimately determined that procedure M-50-005, step 5.3.34, contained sufficient clarity to direct maintenance technicians to verify complete engagement of the latch-up lever and trip hook during trip throttle valve reassembly. Therefore, the inspectors ultimately determined that during performance of the previous trip throttle valve overhaul under WO 4260523 during refueling outage 2R16 in May of 2021, Constellation did not adequately perform step 5.3.34 of procedure M-050-005. Constellation captured this NRC-identified aspect under IR 4506446.

Screening: The inspectors determined the performance deficiency was minor. The inspectors screened this performance deficiency in accordance with IMC 0612, Appendix B, "Issue Screening Directions," effective date July 23, 2021, and determined it was minor, because there was no actual adverse impact on system operability, and therefore the issue could not be reasonably viewed as a precursor to a significant event, the issue would not reasonably have the potential to lead to a more significant safety concern, and there was no adverse effect to any cornerstone objective.

Enforcement: Limerick Generating Station, Unit 2, TS 6.8, “Procedures and Programs,” Section 6.8.1a, requires written procedures shall be established, implemented, and maintained covering the activities in Regulatory Guide 1.33, “Quality Assurance Program Requirements,” Revision 2. Regulatory Guide 1.33, Section 9.a, “Procedures for Performing Maintenance,” requires maintenance that can affect the performance of safety-related equipment be properly pre-planned and performed in accordance with written procedures. Constellation procedure M-50-005, “RCIC Turbine Trip Throttle Valve Overhaul HV-50-112/212,” Revision 3, step 5.3.34, requires verification of complete engagement of the latch-up lever and trip hook during trip throttle valve reassembly. Contrary to the above, on May 8, 2021, Constellation did not verify complete engagement of the latch-up lever and trip hook. Consequently, NRC inspectors identified the lack of complete engagement on January 18, 2022, and questioned Constellation operators regarding RCIC operability. Constellation completed an immediate determination of operability on January 18, successfully performed a RCIC surveillance test on January 19, and performed planned corrective maintenance on January 21 to restore compliance by establishing full engagement in accordance with the station procedure.

This failure to comply with TS 6.8 constitutes a minor violation that is not subject to enforcement action in accordance with the NRC’s Enforcement Policy.

Observation: Narrowly Focused Operability Determination for a Pipe Flaw Evaluation Using 50.69 Alternate Treatment	71152A
<p>The inspectors performed a review of Constellation's evaluation and corrective actions in response to a pipe flaw that Constellation identified below the allowable minimum wall thickness per American Society of Mechanical Engineers (ASME) Section XI code class III requirements, during ultrasonic testing (UT) of a 30-inch pipe header that returns the ‘A’ residual heat removal service water (RHRSW) and the ‘A’ ESW subsystems to the spray pond, which Constellation captured under IR 4490951. Specifically, one of the 48 grid locations was identified with a thickness of 0.098 inches, whereas the minimum allowable thickness was 0.169 inches and the nominal thickness was 0.375 inches. The UT was being performed in refueling outage 2R16 (spring 2022), in response to IR 4184952 from October 18, 2018, in which NRC inspectors identified exterior corrosion at the pipe wall penetration.</p>	

In response to the minimum wall pipe flaw, Constellation performed an immediate determination of operability, which cited no through-wall leaks, low operating pressures in each of the subsystems, and considerable station operating experience with localized external corrosion that has not challenged structural integrity of the associated piping. In addition, Constellation performed an engineering technical evaluation (TE) under IR4490951, assignment 2, to further support operation's immediate determination of operability, in accordance with (IAW) OP-LG-108-115-1000, attachment 1, "ASME Class 3, RISC-3 piping Categorized IAW 10 CFR 50.69." The inspectors noted the RISC-3 classification enabled the safety-related, low risk piping to be subjected to alternate treatment, thereby relieving the piping of ASME code class 3 requirements for pipe flaw evaluations. The inspectors reviewed TE 4490951-02 and noted that Constellation performed a thorough assessment of pipe header structural integrity for the existing minimum wall flaw. The inspectors also noted the TE assumed a reasonable external corrosion rate of 0.008 inches (i.e., eight mils) per year, and recommend repairs be performed within four years.

The inspectors determined that Constellation's TE 4490951-02 was narrowly focused on structural integrity of the piping and failed to consider the effects of wall thinning over the four-year period. Specifically, data was not obtained for five grid locations immediately adjacent to the minimum wall flaw location, due to external surface corrosion roughness. At these five locations, the wall thickness was assumed to be 0.034 inches, which represents the minimum thickness obtainable by the UT equipment. The inspectors determined the assumed thickness was reasonably conservative, however, also noted that the assumed corrosive loss rate of eight mils over four years would render the piping with two mils of thickness remaining, which could result in a localized through-wall flaw. The inspectors further noted that a through wall flaw spanning across the five grid locations could render a hole in the pipe that exceeded the allowable leak rate of each of the RHRSW and ESW subsystems.

Additionally, the inspectors noted that Constellation did not assign periodic follow-up inspections of the minimum wall flaw location until repairs would be performed. While the inspectors noted that follow-up inspections were not required on RISC-3 piping, the inspectors also noted that Constellation procedures discuss the performance of periodic inspections on pipe flaws. Specifically, OP-LG-108-115-1000, attachment 1, page 2 of 3, note 5 states that the flaw has to be capable of being monitored during operator rounds as one of the conditions to support operability; and Constellation procedure ER-AA-5400-1001, "Raw Water Pipe Integrity Management Guide," attachment 8, step 3.1.3, recommends multiple inspections over a known time interval, to validate assumed corrosion rates in raw water systems. Finally, the inspectors performed multiple walkdowns of the minimum wall flaw location and noted that Constellation had performed subsequent external coating of the piping, following identification of the minimum wall flaw, to protect against further external corrosion. The inspectors noted that Constellation did not take credit for the external coating in TE 4490951-02, nor in the operability determination under IR 4490951.

Constellation captured the inspectors' observations under IR 4506142, which included an assignment to evaluate the TE for any updates, including consideration for the performance of periodic inspections. The inspectors did not identify any performance deficiencies during performance of this inspection.

Observation: Semiannual Trend Review	71152S
The inspectors performed a semiannual review to identify trends that might indicate the existence of a more significant safety issue, including issues that may have been documented outside the normal CAP. Overall, the inspectors determined that Constellation	

was appropriately identifying, evaluating, and resolving adverse trends. However, the inspectors identified one adverse trend associated with repetitive clogging of various reactor building drains, for which the inspectors noted Constellation had not formally documented the presence of an adverse trend:

- Unit 2 refuel floor drainage clogging (IR 4502614)
- Unit 2 reactor building drain backed up (IR 4495516)
- Unit 2 reactor building drain clogging (IR 4495503)
- Unit 2 reactor building clogged floor drains (IR 4489922)
- Unit 2 reactor building drain degraded (IR 4478419)
- Unit 1 reactor building drain backed up (IR 4495513)
- Unit 1 reactor floor drains backed up (IR 4495149)
- Unit 1 reactor building drain flow backup multiple times (IR 4493309)
- Unit 1 reactor building drains backed up (IR 4477593)

Based on the overall results of the semiannual trend review, the inspectors determined that Constellation appropriately responded with actions commensurate with the safety significance of each issue, and therefore determined this adverse trend was not indicative of a more significant safety issue. Specifically, the inspectors walked down the areas associated with the clogged drains; reviewed various documents including drain piping isometric prints, the internal flood probabilistic risk analysis document, the Updated Final Safety Analysis Report, and high-energy and moderate-energy line break analyses; and discussed the issues with operators, technicians, and engineers. The inspectors noted that Constellation planned corrective maintenance activities under one master WO for each unit, which included hydrolazing clogged piping and cutting out sections of clogged drain piping to replace it. The inspectors did not identify any performance deficiencies associated with the semiannual trend review.

EXIT MEETINGS AND DEBRIEFS

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

- On July 26, 2022, the inspectors presented the integrated inspection results to Matthew Bonanno, Plant Manager, and other members of the licensee staff.
- On April 8, 2022, the inspectors presented the 71124.01 Radiological Hazard Assessment and Exposure Controls inspection results to Michael Gillin, Plant Manager, and other members of the licensee staff.
- On April 22, 2022, the inspectors presented the Unit 1 License Renewal Phase 1 inspection results to Frank Sturniolo, Site Vice President, and other members of the licensee staff.
- On April 22, 2022, the inspectors presented the Unit 1 Inservice Inspection results to Frank Sturniolo, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71003	Corrective Action Documents	IR 04491609		
		IR 04494706		
		IR 04495204		
	Corrective Action Documents Resulting from Inspection	IR 04493142		
		IR 04495061		
	Engineering Changes	EC 633382	Suppression Pool Coatings Commitment Acceptance Criteria Change	Revision 0
	Miscellaneous	LG-AMP-PBD-XI.E5	Program Basis Document for Fuse Holders	Revision 4
		LG-AMP-PBD-XI.M20	Program Basis Document for Open-Cycle Cooling Water System	Revision 6
		LG-AMP-PBD-XI.M32	Program Basis Document for One-Time Inspection	Revision 4
		LG-AMP-PBD-XI.S1	Program Basis Document for ASME Section XI, Subsection IWE	Revision 3
		LG-AMP-PBD-XI.S8	Program Basis Document for Protective Coating Monitoring and Maintenance Program	Revision 0
		NE-101	Specification for Coating, Inspection, and Coating Repair of the Suppression Chambers at Limerick Generating Station Units 1 and 2	Revision 8
		Procedures	ER-AA-330-008	Exelon Safety-Related (Service Level I) Protective Coatings
	ER-AA-5400		Buried Piping and Raw Water Integrity Management Programs Guide	Revision 13
	ER-AA-5400-1001		Raw Water Piping Integrity Management Guide	Revision 12
	ER-AA-700-301		License Renewal One-Time Inspection Program	Revision 1
	IC-11-00122		Cleaning, Examination, and Resistance Check of the Fluid Components Inc. Linear Flow Elements and Calibration of the Fluid Components Inc. Flow Transmitters	Revision 14
	MA-LG-793-001		Visual Examination of Containment Vessels and Internals	Revision 11

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.08G	Corrective Action Documents	IR 04493224		
		IR 04493717		
		IR 04494053		
	Corrective Action Documents Resulting from Inspection	IR 04494845		
	Engineering Changes	EC 631225	Evaluation of Unit 1 DCA-319-1 N5A Flaw Identified in IR 04332524	Revision 0
	Miscellaneous	ER-LG-330-1001	ISI Program Plan Fourth Ten-Year Inservice Inspection Interval	Revision 21
		ER-LG-330-1002	ISI Augmented Inspection Program	Revision 8
		ER-LG-330-1006	Risk Informed Inservice Inspection Evaluation	Revision 4
	Procedures	CC-AA-501-1025	Weld End Preparation and Joint Details	Revision 6
		EPRI-DMW-PA-1	Procedure for Manual Phased Array Ultrasonic Examination of Dissimilar Metal Welds	Revision 6
		ER-AA-335-018	Visual Examination of ASME IWE Class MC and Metallic Liners of Class CC Components	Revision 15
		ER-AA-335-031	Ultrasonic Examination of Austenitic Piping Welds	Revision 9