



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

August 11, 2020

Mr. Bryan C. Hanson
Senior VP, Exelon Generation Company, LLC
President and CNO, Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

**SUBJECT: QUAD CITIES NUCLEAR POWER STATION – INTEGRATED INSPECTION
REPORT 05000254/2020002 AND 05000265/2020002**

Dear Mr. Hanson:

On June 30, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Quad Cities Nuclear Power Station. On July 7, 2020, the NRC inspectors discussed the results of this inspection with Mr. K. Ohr, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

One Severity Level IV violation without an associated finding is documented in this report. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

No NRC-identified or self-revealing findings were identified during this inspection.

A licensee-identified violation which was determined to be of very low safety significance is documented in this report. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at Quad Cities Nuclear Power Station.

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,

/RA/

Kenneth R. Riemer, Chief
Branch 1
Division of Reactor Projects

Docket Nos. 05000254 and 05000265
License Nos. DPR-29 and DPR-30

Enclosure:
As stated

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Letter to Bryan Hanson from Kenneth Riemer dated August 11, 2020.

SUBJECT: QUAD CITIES NUCLEAR POWER STATION – INTEGRATED INSPECTION REPORT 05000254/2020002 AND 05000265/2020002

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

Docket Numbers: 05000254 and 05000265

License Numbers: DPR-29 and DPR-30

Report Numbers: 05000254/2020002 and 05000265/2020002

Enterprise Identifier: I-2020-002-0037

Licensee: Exelon Generation Company, LLC

Facility: Quad Cities Nuclear Power Station

Location: Cordova, IL

Inspection Dates: April 01, 2020 to June 30, 2020

Inspectors: J. Cassidy, Senior Health Physicist
N. Feliz Adorno, Branch Chief
C. Matthews, Illinois Emergency Management Agency
R. Murray, Senior Resident Inspector
J. Park, Reactor Inspector
E. Sanchez Santiago, Senior Reactor Inspector
D. Tesar, Resident Inspector

Approved By: Kenneth R. Riemer, Chief
Branch 1
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Quad Cities Nuclear Power Station, 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

Inadequate Design Change Control Resulted in Unplanned Unavailability of the Safety-Related Train of the Control Room Emergency Ventilation System			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000254,05000265/2020002-01 Open/Closed	None (NPP)	71153
The licensee identified a Green finding and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," when the licensee failed to incorporate design changes into controlled documents per Engineering Change 387649, "Refrigeration Condensing Unit (RCU) 0-9400-102 (B CREV) Circuit Breaker At 1-7800-18-4-D1 is Nuisance Tripping," resulting in unplanned unavailability/inoperability of the safety-related train of the control room emergency ventilation system (CREVS).			

Violation of Technical Specification 3.5.1.H for Inoperable Automatic Depressurization System Valve			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Not Applicable	NCV 05000265/2020002-02 Open/Closed	Not Applicable	71153
A self-revealed Severity Level (SL) IV non-cited violation of Technical Specification (TS) 3.5.1, <i>Emergency Core Cooling System - Operating</i> , was identified when it was discovered, following shutdown for a scheduled refueling outage, that during performance of them TS Surveillance Requirement (SR) 3.5.1.10, the 2-0203-3D electromatic relief valve (ERV) failed to actuate. The licensee determined the 3D automatic depressurizing system (ADS) valve was inoperable for the entire cycle, which was a violation of Limiting Condition for Operation (LCO) 3.5.1, Condition H for one ADS valve inoperable, which required that the valve is restored to an operable condition within 14 days.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000265/2020-002-00	LER 2020-002-00 for Quad Cities Nuclear Power Station, Unit 2, Electromatic Relief Valve 3D Did Not Actuate Due to Out of Specification Plunger	71153	Closed
LER	05000254,05000265/2020-001-00	LER 2020-001-00 for Quad Cities, Unit 1, Control Room	71153	Closed

		Emergency Ventilation Air Conditioning System Inoperable Due to Incorrect Breaker Setting		
LER	05000265/2020-001-00	LER 2020-001-00 for Quad Cities Nuclear Power Station, Unit 2, Loss of Both Divisions of Residual Heat Removal Low Pressure Coolant Injection Due to Swing Bus Failure to Transfer	71153	Closed

PLANT STATUS

Unit 1

The unit began the inspection period at full-rated thermal power, where it remained for the entire inspection period, with the exception of planned power reductions for turbine testing, scram timing testing, control rod pattern adjustments, and other short-term power reductions as requested by the transmission system operator.

Unit 2

The unit began the inspection period shut down for Refueling Outage Q2R25. Startup on Unit 2 was commenced on April 13, 2020, and the unit was synchronized to the grid on April 15, 2020. The unit reached full-rated thermal power on April 17, 2020. There was an unplanned down power to 23 percent on April 21, 2020, for troubleshooting of a generator protective relay. Unit 2 returned to full-rated thermal power on April 22, 2020. On April 27, 2020, there was an unplanned down power to 85 percent rated thermal power to facilitate repairs to the 2B reactor feed pump drain line. Unit 2 returned to full-rated thermal power on April 28, 2020, where it remained for the duration of the inspection period, with the exception of planned power reductions for turbine testing, control rod pattern adjustments, and other short-term power reductions as requested by the transmission system operator.

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.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time the resident inspectors performed periodic site visits each week and during that time conducted plant status activities as described in IMC 2515, Appendix D; observed risk significant activities, and completed on-site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on-site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

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

- (1) The inspectors evaluated readiness for seasonal extreme weather (summer/hot weather) conditions prior to the onset of extreme temperatures for the following systems:
 - Unit 1/2 control room heating ventilation and air conditioning
 - Units 1 and 2 service water systems

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

- (1) The inspectors evaluated flood protection barriers, mitigation plans, procedures, and equipment for both Unit 1 and Unit 2 to verify they are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

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

- (1) Units 1 and 2 fuel pool cooling systems on April 8, 2020
- (2) Unit 2 4kV and 480V safety-related electrical plant lineup on April 8, 2020
- (3) Common Unit 1/2 'B' standby gas treatment on April 27, 2020

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the Unit 2 standby liquid control system on April 27, 2020.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 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) Fire Zone 1.1.1.5, reactor building, elevation 666'-6", [Unit 1 and Unit 2] stand-by liquid control 4th floor east/west on April 27, 2020
- (2) Fire Zone 1.1.2.5, reactor building, elevation 666'-6", [Unit 1 and Unit 2] stand-by gas treatment 4th floor east/west on April 27, 2020
- (3) Fire Zone 8.2.8.B and C, Unit 1 and Unit 2 turbine building, elevation 639'-0", Motor Generator Set 1A and 2B on April 30, 2020

- (4) Fire Zones 1.1.1.5A and 1.1.1.6A, Unit 1/2 turbine building, elevation 658'-0"/678'-0", reactor building vent floors, 4kV Swgr. 13-1/24-1, MG Sets 1A and 2B on April 30, 2020

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Units 1 and 2 service water internal flooding on May 4, 2020

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 the reactor coolant system boundary, reactor vessel internals, risk-significant piping system boundaries, and containment boundary were appropriately monitored for degradation and repairs and replacements were appropriately fabricated, examined and accepted by reviewing documentation for the following activities from March 31, 2020 to April 9, 2020:

03.01.a - Nondestructive Examination and Welding Activities.

1. Ultrasonic volumetric examination of vessel-to-nozzle weld N5A-NOZ, Category B-D, Item B3.90 using procedure GEH-UT-300
2. Ultrasonic volumetric examination of vessel nozzle inner radius N5A-IRS, Category B-D, Item B3.100 using procedure GEH-UT-311
3. Ultrasonic volumetric examination of weld 30B-S24, Category R-A, Item R1.20-4 using procedure GEH-PDI-UT-1
4. Ultrasonic volumetric examination of weld 1012A-1, Category R-A, Item R1.11-5 using procedure GEH-PDI-UT-1
5. Ultrasonic volumetric examination of weld 1012A-2, Category R-A, Item R1.11-5 using procedure GEH-PDI-UT-1
6. Magnetic particle surface examination of saddle-to-nozzle weld N8A-F2 RHRHX, Category C-B, Item C2.31 using procedure ER-AA-335-003
7. Magnetic particle surface examination of support-to-shell weld 1003A-W-201A, Category C-C, Item C3.10 using procedure ER-AA-335-003
8. Visual examination of pipe hanger support 2305-W-214, Category F-A, Item 1.20A using procedure ER-AA-335-016
9. Visual examination of IWE Interfaces of Drywell Head Bolting 2DWH-Bolting, Category E-G, Item E8.10 using procedure ER-AA-335-018
10. Report No. Q2R24-R-10, Component ID RPV-TTHF, Category B-A, Item B1.40 with relevant indications identified during prior outage accepted for continued service
11. Pressure boundary weld numbers 1 through 6 for Work Order 00783623-01

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (2 Samples)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during Unit 2 startup from Refueling Outage Q2R25 on April 13, 2020.
- (2) The inspectors observed and evaluated licensed operator performance in the control room during Unit 2 turbine-to-grid synchronization on April 15, 2020.

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

- (1) The inspectors observed and evaluated licensed operator regualification training in the simulator on June 8, 2020.

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 remain capable of performing their intended function:

- (1) service water system on June 2, 2020

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) E-2 Certification and Work Week Risk Evaluation for week of May 17, 2020
- (2) Work Week Risk for safe shutdown pump planned maintenance and 2A and 2B residual heat removal pumps planned maintenance during week of May 26, 2020
- (3) E-2 Certification and Work Week Risk Evaluation for week of June 22, 2020
- (4) E-2 Certification and Work Week Risk Evaluation for week of June 29, 2020
- (5) Work Week Risk assessment associated with impending severe weather (thunderstorms), hot weather readiness, reactor core isolation cooling work window and emergent scope, and 1/2 emergency diesel generator concurrent activities during the week of June 22, 2020

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

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

- (1) Issue Report 4323520, "[Unit 1] HPCI [high pressure coolant injection] FIC [flow indicating controller] Stuck at Max Flow," on March 4, 2020

- (2) Issue Report 4328207, "[Unit 1] LPCI [low pressure coolant injection] Loop Select," on March 20, 2020
- (3) Issue Report 4333200, "[Unit 2] Vibrations and Current Swings on #2 125 Vdc Charger," on April 7, 2020
- (4) Issue Report 4327393, "[Unit 1] LPCI Loop Select Operability Following QCOS 1000-03," on April 29, 2020
- (5) Issue Report 4347201 "EO [equipment operator] ID'd Excessive No Flow Time During [Unit 1] HPCI Venting," on June 1, 2020
- (6) Issue Report 4350782, "Unit 2 HPCI Room Temp High," on June 16, 2020

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post maintenance test activities to verify system operability and functionality:

- (1) total as-left local leak rate test results following outage work on April 13, 2020
- (2) QOS 6500-04, "Bus 23-1 Undervoltage Test," following UAT T-21 replacement on April 21, 2020
- (3) Unit 2, 2A standby liquid control pump flow test following pump overhaul on May 11, 2020
- (4) QCOS 1400-1, "Unit 2 Core Spray Pump Flow Rate Test," following cubicle inspection and relay testing on May 18, 2020
- (5) QCOS 1000-28, "[Unit 2] 2A Residual Heat Removal Service Water Pump Comprehensive/PerformanceTest," following pump outboard seal and wear ring replacement on May 23, 2020
- (6) Unit 1/2 safe shutdown makeup pump post-maintenance testing following planned maintenance on May 26, 2020

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Partial)

- (1) (Partial)
 The inspectors evaluated the Unit 2 Refuel Outage Q2R25 activities that continued into the second quarter (began on March 30, 2020 and completed on April 15, 2020). In accordance with the memo from Ho Nieh, Director of the Office of Nuclear Reactor Regulation, dated May 28, 2020 (ML 20141L66), this inspection was considered partially completed. Inspection Procedure 71111.20, "REFUELING AND OTHER OUTAGE ACTIVITIES," had 18 high level requirements to complete the IP. Section .03.02.d.2, "Containment Closure," requires, in part, that "If containment is opened, conduct a walkdown of containment just before closure." The inspectors were unable to perform a physical walkdown of containment due to the NRC's response to COVID-19. The inspectors performed a review of video footage of the licensee's complete walkdown of the containment prior to closure of the containment, just before the startup from Refueling Outage Q2R25. Inspection Manual Chapter 2515 states that "the inspector is to perform the inspection requirements most appropriate ... to the activity being inspected in order to declare an activity (sample) as being satisfactorily completed." Inspectors that do not complete a high-level requirement when it is available to be completed will need to document the IP as partially completed.

For IP 71111.20, there was no means to go back and complete the missed requirement. The inspectors determined that while the requirement was not completed (and considered "partial" or not complete), the objective of the walkdown was completed and the inspection procedure objective was completed.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (4 Samples)

- (1) QCOS 2300-05, "[Unit 2] HPCI Pump Operability Test," on April 14, 2020
- (2) QCOS 1000-20, "[Unit 2B] RHR [residual heat removal]/RHR Service Water Pump Breaker Local Control Test for Appendix R," on April 30, 2020
- (3) QCOS 6620-10, "[Unit 1] SBO [station blackout] DG [diesel generator] Endurance/Margin and Full Load Reject Test," on April 30, 2020
- (4) QCOS 6500-09, "Functional Test of Unit 1 Second Level Undervoltage," on June 24, 2020

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) QCOS 1000-6, "[Unit 2] RHR Pump/Loop Operability Test," on April 30, 2020

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

- (1) Unit 2 main steam isolation valve local leak rate test (continued from last quarter) on April 1, 2020

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

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

- (1) (Partial)
The inspectors evaluated radiological protection-related instructions to plant workers.

71124.04 - Occupational Dose Assessment

Source Term Characterization (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated licensee performance as it pertains to radioactive source term characterization.

External Dosimetry (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated licensee performance as it pertains to external dosimetry that is used to assign occupational dose.

Internal Dosimetry (IP Section 03.03) (1 Sample)

The inspectors evaluated the following internal dose assessments for actual internal exposures:

- (1) Dose assessment for an individual who alarmed a portal monitor after supporting main steam isolation valve work in the drywell on March 27, 2019 (Issue Report 4233376)

Special Dosimetric Situations (IP Section 03.04) (1 Sample)

The inspectors evaluated the following special dosimetric situations:

- (1) Dose assessment for one declared pregnant worker

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

- (1) Unit 1 (04/01/2019-03/31/2020)
- (2) Unit 2 (04/01/2019-03/31/2020)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

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

- (1) Issue Report 4129537, "Potential Single Point Vulnerability HPCI Aux Oil Pump PS," Action Item 04 completed on May 22, 2020

71153 - Followup of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01) (2 Samples)

- (1) The inspectors evaluated Issue Report 4335396, "Unit 2 Main Generator Negative Sequence," (also Issue Reports 4335468 and 4335834) and the licensee's response on April 15, 2020.
- (2) The inspectors evaluated Issue Report 4337161, "Received 902-8 A-11 U2 Main Generator Negative Sequence," (also Issue Report 4337157) and the licensee's response on April 22, 2020.

Event Report (IP Section 03.02) (3 Samples)

The inspectors evaluated the following licensee event reports (LERs):

- (1) Licensee Event Report 05000265/2020-001-00, Loss of Both Divisions of Residual Heat Removal Low Pressure Coolant Injection Due to Swing Bus Failure to Transfer (ADAMS Accession No. ML20140A093). The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER; therefore, no performance deficiency was identified. The inspectors did not identify a violation of NRC requirements.
- (2) Licensee Event Report 05000265/2020-002-00, Electromatic Relief Valve 3D Did Not Actuate Due to Out of Specification Plunger (ADAMS Accession No. ML20149K600). The inspection conclusions associated with this LER are documented in this report under Inspection Results Section 4OA3.
- (3) Licensee Event Report 2020-001-00 for Quad Cities, Unit 1, Control Room Emergency Ventilation Air Conditioning System Inoperable Due to Incorrect Breaker Setting (ADAMS Accession No. ML20163A145). The inspection conclusions associated with this LER are documented in this inspection report under Inspection Results Section 4OA3.

INSPECTION RESULTS

Observation: Review of High Pressure Core Injection Single Point Vulnerability Identified in Issue Report 4129537	71152
<p>The inspectors identified a corrective action item which was Action Item 04 under Issue Report 4129537 that was completed on May 22, 2020. Issue Report 4129537, "Potential Single Point Vulnerability for HPCI Logic," documented that a failed pressure switch in the HPCI start logic could prevent automatic HPCI initiation. On March 21, 2018, during Refueling Outage Q2R24, while performing a HPCI system logic functional test, the Unit 2 HPCI auxiliary oil pump failed to auto-start due to pressure switch 2-2341-4 contacts stuck in the open position as documented under Issue Report 4117639, "Unit 2 HPCI Logic Test Discrepancy." The licensee also reviewed the Unit 1 HPCI logic and pressure switch 1-2341-4 for extent of condition and noted the failure of pressure switch 1-2341-4 would prevent the Unit 1 HPCI auxiliary oil pump from auto-starting. For both units, HPCI would be able to be manually started by placing the associated auxiliary oil pump control switch to manual which would allow HPCI injection. The issue was reviewed by engineering for potential single-point vulnerability in that a failure of pressure switch 1(2)-2341-4 contacts to open would prevent the HPCI auxiliary oil pump from starting and prevent subsequent automatic actions for HPCI initiation from occurring as well (i.e. HPCI would not auto-start and inject into the reactor pressure vessel). Engineering determined that the current design of the logic circuit was acceptable, and planned follow-up actions for future outages to perform one-time inspections of the pressure switch contacts, wiring, and terminal connections. This one-time inspection was intended to verify the corrective actions from Issue Report 4117639 and the extent of condition on Unit 1. The inspectors verified the pressure switches used in this application were classified as safety-related in the licensee's Passport system. The inspectors did not identify any issues of concern.</p>	

Inadequate Design Change Control Resulted in Unplanned Unavailability of the Safety-Related Train of the Control Room Emergency Ventilation System			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000254,05000265/2020002-01 Open/Closed	None (NPP)	71153
<p>The licensee identified a Green finding and associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," when the licensee failed to incorporate design changes into controlled documents per Engineering Change 387649, "Refrigeration Condensing Unit (RCU) 0-9400-102 (B CREV) Circuit Breaker At 1-7800-18-4-D1 is Nuisance Tripping," resulting in unplanned unavailability/inoperability of the safety-related train of the control room emergency ventilation system (CREVS).</p> <p><u>Description:</u></p> <p>The licensee performed an equipment apparent cause evaluation (EACE) (AT 01322407-02) in February 2012, after a series of nuisance trips for the 'B' train CREVS RCU 0-9400-102 breaker. The findings of the EACE concluded that due to the type of equipment supported by the breaker and its cyclic operation, the breakers instantaneous thermal trip settings needed to be increased to the maximum manual setting (10) to avoid continued nuisance trips. The trip setting of 8.8 was acceptable, but due to the high importance of the system, the trip setting of 10 was recommended for additional margin to ensure continuity of service.</p> <p>The licensee approved, based on the findings of the EACE, Engineering Change 387643, "Refrigeration Condensing Unit (RCU) 0-9400-102 (B CREV) Circuit Breaker At 1-7800-18-4-D1 is Nuisance Tripping," on February 7, 2012, and under Work Order 1511315, "'B' Control Room HVAC [heating, ventilation, and air conditioning] RCU BKR Found Tripped," the breaker trip setting was set to 10 in order to prevent nuisance trips of the breaker.</p> <p>The licensee also created Engineering Change 387649, "Update The Passport Parameters Panel For 1-7800-18-4-1D," on February 7, 2012, for the purpose of updating the thermal trip settings of Motor Control Center (MCC) 18-4-1D in the Passport parameters panel for future work orders. This engineering change was not assigned to any individual to complete until February 25, 2013, over a year later.</p> <p>Design engineering assumed that the preventive maintenance (PM) for the breaker would be credited to the work done under troubleshooting Work Order 1511315, thus resetting the due date for the next PM performance to 8 years. However, the work performed under Work Order 1511315 did not include the full scope of the PM, and the only work performed was changing the trip setting dial. Therefore, maintenance did not take credit for completing the PM and the normal PM due date remained, with the next PM due 18 months after the trip setting was adjusted.</p> <p>In preparation for the normal 8Y PM of the breaker (PMID 33380-01), planners prepared Work Order 1503327-01 using the setting of 8.8 which was in the Passport parameters panel. This work order was set to ready on August 10, 2013. Design engineering implemented Engineering Change 387649 and the Passport parameters were updated on August 14, 2013, 4 days after the PM work order was set to ready.</p>			

During execution of Work Order 1503327-01, Section 4.3.2, on October 15, 2013, electrical maintenance personnel found the trip setting to be 10, which was unexpected. No issue report was written to document the unexpected "as found" condition. Standard PM process would have electrical maintenance contact the first-line supervisor who would look to the previous PM, verify those calculations were accurate, and test the trip settings from the previous PM. Since the EACE and Engineering Change 387643 were performed under a troubleshooting work order, this information would not be referenced during the PM. Electrical maintenance proceeded with the PM and set the breakers instantaneous thermal trip setting to 8.8. There was also no additional documentation of the "As-Found" condition of the breaker or what was done to resolve the difference.

On April 14, 2020, at 4:45 p.m., operations noticed that there was no indicating light for the 'B' train control room heating, ventilation, and air conditioning RCU 0-9400-102 on the main control room panel 912-5. At 5:00 p.m., an operator was dispatched and found that local indications also showed the RCU to have no power and that the breaker, MCC 18-4-1D, was in a tripped condition. Per the unit supervisor, at 5:05 p.m., the breaker was reset, and light indication was restored. Electrical maintenance personnel performed a breaker and cubicle inspection on April 16, 2020, and found that the thermal overload trip setting on the breaker was set at 8.8. A review of the breaker parameters showed that the trip setting should have been set at 10. Electrical maintenance department performed a post-maintenance test on the breaker and cubicle, under Work Order 5030410, setting the thermal trip setting to 10. The 'B' CREVS was run as part of the post-maintenance test (-02 task) from 03:45-04:49 on April 16, 2020, satisfactorily. The 'B' CREVS was run on April 19, 20, and 22, 2020, satisfactorily, satisfying the post-maintenance test requirements.

This instance of the MCC 18-4-1D breaker trip was a reportable event under 10 CFR 50.73(a)(2)(v)(D) – "Any event of condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident." This was also a Maintenance Rule Functional Failure: VC5795-02, 'B' train, provide temperature control.

Corrective Actions: Corrective actions included a corrective action program evaluation to determine cause, procedure revisions to specify initiation of an issue report if unexpected conditions are found during the performance of PM, and case studies to discuss verifying assumptions and the result and findings of Issue Report 4335536.

Corrective Action References: Issue Report 4335536, "Lost Light Indication for Control Room 'B' Train RCU," and Issue Report 1322407, "'B' Control Room HVAC RCU BKR Found Tripped"

Performance Assessment:

Performance Deficiency: The licensee failed to maintain proper design control for implementation of Engineering Change 387649 as required by 10 CFR 50 Appendix B, Criterion III, resulting in unplanned unavailability/inoperability of the safety-related train of the CREVS.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the Performance Deficiency was similar to

examples found in IMC 0612, Appendix A, Section 3, specifically 3b and 3i in that: The Performance Deficiency adversely affected the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to incorporate design changes into controlled documents resulted in the safety-related train of the CREVS becoming inoperable when the breaker to the 'B' CREVS RCU tripped inadvertently.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined the finding was Green using IMC 0609, Appendix A, Exhibit 2, Mitigating Systems Screening Questions, Section A, "Mitigating SSCs [structures, systems, and components] and PRA [probabilistic risk assessment] Functionality (except Reactivity Control Systems)," because the finding did not result in the loss of the probabilistic risk assessment function of a single train TS system for greater than its TS-allowed outage time.

Cross-Cutting Aspect: Not Present Performance. No cross cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: Title 10 CFR 50, Appendix B, Criterion III, Design Control, requires in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." And that, "Measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations. These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces." In addition, "Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design..."

Contrary to the above, on February 7, 2012, the licensee failed to control design interfaces and coordination among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces for a design change. Specifically, the licensee failed to ensure the review, approval, release, distribution, and revision to documents associated with Engineering Change 387649 which revised the thermal overload setpoint for the 'B' train control room HVAC RCU 0-9400-102 breaker.

Enforcement Action: This violation is being treated as an non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Violation of Technical Specification 3.5.1.H for Inoperable Automatic Depressurization System Valve			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000265/2020002-02 Open/Closed	Not Applicable	71153
<p>A self-revealed Severity Level (SL) IV non-cited violation of Technical Specification (TS) 3.5.1, <i>Emergency Core Cooling System - Operating</i>, was identified when it was discovered, following shutdown for a scheduled refueling outage, that during performance of the TS Surveillance Requirement (SR) 3.5.1.10, the 2-0203-3D electromatic relief valve (ERV) failed to actuate. The licensee determined the 3D automatic depressurizing system (ADS) valve was inoperable for the entire cycle, which was a violation of Limiting Condition for Operation (LCO) 3.5.1, Condition H for one ADS valve inoperable, which required that the valve is restored to an operable condition within 14 days.</p> <p><u>Description:</u></p> <p>On March 30, 2020, with Unit 2 in shutdown for Refueling Outage Q2R25, during performance of the TS SR 3.5.1.10, the 2-0203-3D ERV failed to actuate. Technical Specification SR 3.5.1.10 required each ADS valve actuator stroke when manually actuated. All other ADS valves on Unit 2 were found to stroke successfully. The licensee reported this issue in LER 05000265/2020-002, in accordance with 10 CFR 50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's TS. The licensee determined the 3D ADS valve was inoperable for the entire cycle.</p> <p>Technical Specification LCO 3.5.1 requires that each emergency core cooling system injection/spray subsystem and the ADS function of five relief valves shall be OPERABLE. Limiting Condition for Operation 3.5.1, Condition H for one ADS valve inoperable requires that the valve is restored to an operable condition within 14 days. Limiting Condition for Operation 3.5.1, Condition I states the required action and associated completion time for Condition H was not met, which requires the licensee to be in Mode 3 within 12 hours.</p> <p>The failed actuator for the 2-0203-3D ERV was originally installed in March 2018 after having been rebuilt in February 2018 in preparation for Refueling Outage Q2R24. The actuator was rebuilt in accordance with the site maintenance rebuild procedure. On April 5, 2018, during an auto blowdown functional test operating surveillance and post-maintenance test, the 2-0203-3D ERV did not initially actuate as expected with the ERV remaining in the closed position. Issue Report 4123272, "AO [Air Operated] 2-0203-3D ERV Solenoid Issue During Logic Test," was generated, and troubleshooting and maintenance were performed to smooth the actuator plunger sides to correct the actuator sticking. The valve was subsequently cycled three times successfully and was returned to service. The next test of the ERV was on March 30, 2020, when it failed during Refueling Outage Q2R25.</p> <p>Following the 2020 failure, the removed 2-0203-3D ERV actuator was disassembled and inspected to determine the cause of the failure. The initial observations and stroking of the actuator with the cover removed noted that the upper guide bracket was tilted down on the left end. As the actuator was stroked and returned to the standby state, the tilt of the upper guide bracket would vary from stroke to stroke, causing the sticking of the actuator to be intermittent. Observation of the plunger during testing noted that it would intermittently rub</p>			

with the lever arm on the left side. The plunger width was found to be different from the top to mid-length, indicating the legs were splaying. This plunger width was outside the manufacturer's tolerance for plunger width. The measured width of 2.592" is 0.027" larger than the manufacturer's tolerance for plunger width of 2.565". The plunger width was not a parameter that was measured during vendor dedication until 2019, after the rebuild of the actuator that occurred in 2018.

The inspectors determined that the licensee's actions in 2018 were appropriate; they attempted to implement corrective actions for the failed testing and performed three successful strokes of the valve as a post-maintenance test prior to returning the valve to service. The inspectors concluded that the issues that led to the failure in 2020 were not foreseeable and correctable by the licensee.

Corrective Actions: The 2-0203-3D actuator was replaced and stroked (10 times) successfully prior to completion of Refueling Outage Q2R25, restoring the system to operable. The additional number of valve strokes was one of the procedural corrective actions generated by the licensee.

Corrective Action References: Issue Report 4330737, "ERV 2-0203-3D Relief Valve Did Not Actuate"

Performance Assessment:

The NRC determined this violation was not reasonably foreseeable and preventable by the licensee and therefore is not a performance deficiency.

Enforcement:

Enforcement Policy Section 2.2.4 states that violations with no associated performance deficiency will be dispositioned using traditional enforcement. Therefore, operating reactor violations with no associated performance deficiencies should be assigned a severity level as long as the violation meets the criteria described in Section 2.3.2 of the Policy for disposition as a NCV.

Severity: Traditional Enforcement is being used to disposition this violation with no associated Reactor Oversight Process performance deficiency, per NRC Enforcement Manual, Revision 11, Section 3.10. The inspectors determined the severity of the violation using Section 6 of the NRC Enforcement Policy and determined this issue was a SL IV because it most represented the examples in Section 6.1.d. The failure to meet the TS LCO and Action Statement was unknown to the licensee until they performed the required surveillance test during Refueling Outage Q2R25, while the plant was no longer in the condition of applicability.

Violation: Technical Specification LCO 3.5.1 requires that each emergency core cooling system injection/spray subsystem and the ADS function of five relief valves shall be OPERABLE. Limiting Condition for Operation 3.5.1, Condition H for one ADS valve inoperable requires that the valve is restored to an operable condition within 14 days. Limiting Condition for Operation 3.5.1, Condition I states the required action and associated completion time for Condition H was not met, which requires the licensee to be in Mode 3 within 12 hours.

Contrary to the above, from March 2018 until March 2020, the Unit 2 3D ERV ADS function was inoperable, was not restored to an operable condition, and the licensee did not enter Mode 3 within 12 hours.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

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

- On July 7, 2020, the inspectors presented the integrated inspection results to Mr. K. Ohr, Site Vice President, and other members of the licensee staff.
- On April 9, 2020, the inspectors presented the inservice inspection results to Mr. K. Ohr, Site Vice President, and other members of the licensee staff.
- On April 16, 2020, the inspectors presented the radiation protection inspection results to Mr. W. K. Akre, Radiation Protection Manager, and other members of the licensee staff.
- On June 18, 2020, the inspectors presented the radiation protection inspection results to Mr. W. K. Akre, Radiation Protection Manager, and other members of the licensee staff.

THIRD PARTY REVIEWS

The resident inspectors reviewed the World Association of Nuclear Operators (WANO) report from the Peer Review evaluation that was completed in July 2019.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Drawings	FL-1	Flood Barriers Basement Floor	D
71111.01	Procedures	QCAP 0250-06	Control of In-Plant Flood Barriers and Watertight Submarine Doors	15
71111.01	Procedures	QCOA 0010-16	Flood Emergency Procedure	29
71111.04	Procedures	QCOP 1100-01	Standby Operation of Standby Liquid Control System	13
71111.04	Procedures	QCOP 7500-01	Standby Gas Treatment System (SBGTS) Standby Operation and Start Up	22
71111.04	Procedures	QOM 2-1100-01	Unit 2 SBLC Valve Checklist	8
71111.05	Fire Plans	Fire Zone 1.1.1.5	Fire Zone 1.1.1.5 RB 666'-6" Elev. Stand-by Liquid Control 4th Floor East/West	July 2009
71111.05	Fire Plans	Fire Zone 1.1.2.5	Fire Zone 1.1.2.5 RB 666'-6" Elev. Stand-by Gas Treatment 4th Floor East/West	July 2009
71111.08G	Corrective Action Documents	IR 4114472	Recordable Indication on ISI Hanger 2305-W-214 (M-1017D-256)	03/13/2018
71111.08G	Corrective Action Documents	IR 4121523	Q2R24 ISI RPV Closure Head Flange Weld UT Exam Results	03/31/2018
71111.08G	Procedures	ER-AA-335-003	Magnetic Particle (MT) Examination	9
71111.08G	Procedures	ER-AA-335-016	VT-3 Visual Examination of Component Supports, Attachments, and Interior of Reactor Vessels	12
71111.08G	Procedures	ER-AA-335-018	Visual Examination of ASME IWE Class MC and Metallic Liners of IWL Class CC Components	14
71111.08G	Procedures	GEH-PDI-UT-1	PDI Generic Procedure for the Ultrasonic Examination of Ferritic Welds	12
71111.08G	Procedures	GEH-UT-300	Procedure for Manual Examination of Reactor Vessel Assembly Welds In Accordance with PDI	12
71111.08G	Procedures	GEH-UT-311	Procedure for Manual Ultrasonic Examination of Nozzle Inner Radius, Bore and Selected Nozzle to Vessel Regions	19
71111.08G	Work Orders	WO 4761281-01	CM Replace Top Plate Anchors of 2305-W-214 (M-1017D-256)	04/03/2018
71111.08G	Work Orders	WO 783623-01	CM Replace 2-1001-1B RHRSW Valve	03/29/2018
71111.15	Corrective Action Documents	IR 4323520	HPCI FIC Stuck at Max Flow	03/03/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.15	Corrective Action Documents	IR 4328207	LPCI Loop Select	03/20/2020
71111.15	Corrective Action Documents	IR 4333200	Vibrations and Current Swings on #2 125VDC Charger	04/06/2020
71111.19	Corrective Action Documents	IR 4334613	During QOS 6500-4 One Recorder Point Failed due Blown Fuses	04/11/2020
71111.19	Procedures	QCOS 1000-28	RHR Service Water Pump Comprehensive/Performance Test	25
71111.19	Procedures	QCOS 1400-1	OP QCOS 1400-1 B Core Spray Pump Flow Rate GP B PMP Test	50
71111.19	Work Orders	WO 4762015	MM Overhaul 2A Standby Liquid Control Pump	05/07/2020
71111.19	Work Orders	WO 4775349	4 kV Undervoltage Functional Test	04/10/2020
71111.19	Work Orders	WO 4806048	ECCS Simul Auto Actuation and DG Auto Start	04/11/2020
71111.19	Work Orders	WO 5029567	EO ID: 2A RHRSW Pump High Pressure Outboard Seal Leak	02/23/2020
71111.20	Miscellaneous	NF-AA-330	Physical Inventory Report; Q2R25 Core Verification	04/09/2020
71111.20	Work Orders	WO 5004798	B Loop RHR LPCI Mode Flow Rate	04/30/2020
71111.22	Corrective Action Documents	IR 4330970	PSU Q2R25 Outbd MSIV 2-0203-2B Exceeded TS LLRT Limit	03/30/2020
71111.22	Corrective Action Documents	IR 4330975	PSU Q2R25 Outbd MSIV 2-0203-2C Admin Warning Limit for LLRT	03/30/2020
71111.22	Procedures	QCOS 1000-6	RHR Pump / Loop Operability Test	63
71111.22	Work Orders	WO 5004802	RHR D Pump Flow Rate (IST)	04/30/2020
71111.22	Work Orders	WO 5004803	RHR C Pump Flow Rate (IST)	04/30/2020
71124.01	ALARA Plans	QC-02-20-00508, Task 1	DW Nuclear Instrumentation Activities	03/26/2020
71124.01	ALARA Plans	QC-02-20-00508, Task 2	DW Nuclear Instrumentation IRM/SRM Removal (Q2R25)	03/26/2020
71124.01	ALARA Plans	QC-02-20-00513, Task 1	DW Control Rod Drive Exchange	03/26/2020
71124.01	ALARA Plans	QC-02-20-00513, Task 2	Control Rod Drive Bullpen Support	03/25/2020
71124.01	ALARA Plans	QC-02-20-00513, Task 3	DW Undervessel Prep and Restore Activities	03/25/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71124.01	ALARA Plans	QC-02-20-00701, Task 1	Torus Diving (Q2R25)	03/23/2020
71124.01	ALARA Plans	QC-02-20-00701, Task 2	Torus Dive RP and Tender Activities (Q2R25)	03/24/2020
71124.01	ALARA Plans	QC-02-20-00701, Task 3	Torus Filters (Q2R25)	03/24/2020
71124.01	Corrective Action Documents	IR 4332878	Planned Dose Rate Alarm >150%	04/05/2020
71124.01	Corrective Action Documents	IR 4334908	RP Discontinues Work on Refuel Floor	04/12/2020
71124.01	Radiation Work Permits (RWPs)	QC-02-20-00508	DW Nuclear Instrumentation System	01
71124.01	Radiation Work Permits (RWPs)	QC-02-20-00513	DW Control Rod Drive Exchange	00
71124.01	Radiation Work Permits (RWPs)	QC-02-20-00701	Torus Diving	01
71124.04	Calculations	RP-AA-220, Attachment 2	Intake Investigation Form	03/31/2019
71124.04	Corrective Action Documents	IR 4233376	Positive Whole Body Count	03/27/2019
71124.04	Corrective Action Documents	IR 4332878	Planned Dose Rate >150%	04/05/2020
71124.04	Miscellaneous		Dose Assessment for One Declared Pregnant Worker	03/25/2019
71124.04	Miscellaneous		Neutron Field Characterization Study of Dry Cask Storage ISFSI Campaign	02/01/2014
71124.04	Procedures	RP-AA-203	Exposure Control and Authorization	5
71124.04	Procedures	RP-AA-203-1001	Personnel Exposure Investigations	11
71124.04	Procedures	RP-AA-210	Dosimetry Issue, Usage, and Control	29
71124.04	Procedures	RP-AA-220	Bioassay Program	15
71124.04	Procedures	RP-AA-222	Methods for Estimating Internal Exposure from In Vivo and In Vitro Bioassay Data	6
71124.04	Procedures	RP-AA-270	Prenatal Radiation Exposure	9
71152	Corrective Action Documents	IR 4328189	Part 21 Notification Received for EMD Fuel Injectors	03/20/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152	Corrective Action Documents	IR 4341773	Unit Two Moisture Carryover Greater Than 0.1%	05/07/2020
71152	Corrective Action Documents	IR 4341995	Increased Moisture Carryover on U2	05/08/2020
71153	Corrective Action Documents	IR 4328207	LPCI Swing Bus (MCC 28/29-5) Did Not Transfer QCOS 6700-02	03/20/2020
71153	Engineering Evaluations	QDC-42228	Failure Analysis of Time Delay Relay	05/13/2020
71153	Miscellaneous	LER 20-001-00	Loss of Both Divisions of Residual Heat Removal Low Pressure Coolant Injection Due to Swing Bus Failure to Transfer	05/19/2020
71153	Procedures	QCAN 902-8 A-11	Unit 2 Main Generator Negative Sequence	04/22/2020