



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

November 17, 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: QUAD CITIES NUCLEAR POWER STATION – BIENNIAL PROBLEM
IDENTIFICATION AND RESOLUTION INSPECTION REPORT
05000254/2022013 AND 05000265/2022013

Dear Mr. Rhoades:

On October 7, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Quad Cities Nuclear Power Station and discussed the results of this inspection with Mr. B. Wake, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the station's problem identification and resolution program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for problem identification and resolution programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally, the team reviewed the station's programs to establish and maintain a safety-conscious work environment and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

Three findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) 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.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; 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,



Signed by Ruiz, Robert
on 11/17/22

Robert Ruiz, Chief
Reactor Projects Branch 1
Division of Operating Reactor Safety

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

Enclosure:
As stated

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Letter to David Rhoades from Robert Ruiz dated November 17, 2022.

SUBJECT: QUAD CITIES NUCLEAR POWER STATION – BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000254/2022013 AND 05000265/2022013

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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: 05000254/2022013 and 05000265/2022013

Enterprise Identifier: I-2022-013-0007

Licensee: Constellation Nuclear

Facility: Quad Cities Nuclear Power Station

Location: Cordova, IL

Inspection Dates: August 22, 2022 to November 21, 2022

Inspectors: Z. Coffman, Resident Inspector
T. Gardner, Physical Scientist
Z. Hollcraft, Senior Reactor Operations Engineer
C. Mathews, Illinois Emergency Management Agency
A. Nguyen, Senior Resident Inspector
A. Tran, Project Engineer

Approved By: Robert Ruiz, Chief
Reactor Projects 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 biennial problem identification and resolution 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

Failure to Incorporate Vendor Recommendations into Preventative Maintenance Procedures			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000265/2022013-01 Open/Closed	[P.4] - Trending	71152B
A self-revealed finding of very low safety significance (Green) was identified for multiple examples of the licensee failing to incorporate vendor recommendations into preventative maintenance procedures, resulting in the failure of multiple risk-significant components.			
Failure to Identify and Correct a Condition Adverse to Quality Resulting in Both Trains of Standby Gas Treatment being Rendered Inoperable and Non-Functional			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000254,05000265/2022013-02 Open/Closed	[P.4] - Trending	71152B
A self-revealed finding and associated non-cited violation (NCV) of very low safety significance (Green) was identified for the licensee's failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to take corrective actions to address identified drain line blockages and water accumulation in the main chimney, which eventually accumulated in the common discharge line of the standby gas treatment system to the point where both trains of the system could no longer fulfill their safety functions.			
Failure to Follow Operations Procedures for Lowering Reactor Vessel Water Level			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000265/2022013-03 Open/Closed	[H.9] - Training	71153
A self-revealed finding and associated non-cited violation (NCV) of very low safety significance (Green) was identified for the licensee's failure to follow operations procedures in response to lowering reactor water level due to the 2A feedwater regulating valve (FRV) failing shut. Specifically, the licensee's alarm response procedure and abnormal operations procedure directed operators to initiate an emergency power reduction in response to the lowering reactor water level; however, the operators took different actions to try to manually control the 2B FRV. As a result, operators were driven to initiate a manual scram prior to an automatic one due to the continued lowering reactor water level.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000265/2022-002-00	LER 2022-002-00 for Quad Cities Nuclear Power Station, Unit 2, Manual Scram Due to Feedwater Regulator Valve Failure Decreasing Reactor Water Level	71153	Closed
LER	05000254, 05000265/2022-003-00	LER 2022-003-00 for Quad Cities Nuclear Power Station, Unit 1 and 2, Both Trains of Standby Gas Treatment Inoperable due to Blockage in the Common Discharge Line	71153	Closed

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 – BASELINE

71152B - Problem Identification and Resolution

Biennial Team Inspection (IP Section 03.04) (1 Sample)

- (1) The inspectors performed a biennial assessment of the effectiveness of the licensee's problem identification and resolution program, use of operating experience, self-assessments and audits, and safety-conscious work environment.
 - Problem Identification and Resolution Effectiveness: The inspectors assessed the effectiveness of the licensee's problem identification and resolution program in identifying, prioritizing, evaluating, and correcting problems. The inspectors also conducted a 5-year review of the reactor core isolation cooling system.
 - Operating Experience: The inspectors assessed the effectiveness of the licensee's processes for use of operating experience.
 - Self-Assessments and Audits: The inspectors assessed the effectiveness of the licensee's identification and correction of problems identified through audits and self-assessments.
 - Safety-Conscious Work Environment: The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety-conscious work environment.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (2 Samples)

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

- (1) LER 05000265/2022-002-00, "Manual Scram Due to Feedwater Regulator Valve Failure Decreasing Reactor Water Level," ML22244A135. The inspection conclusions associated with this LER are documented in this report under Inspection Results Section 71153.
- (2) LER 05000265/2022-003-00, "Both Trains of Standby Gas Treatment Inoperable due to Blockage in the Common Discharge Line," ML22244A134. The inspection conclusions associated with this LER are documented in this report under Inspection Results Section 71152B.

INSPECTION RESULTS

Assessment	71152B
<p>Based on the samples reviewed, the team concluded that the licensee's implementation of the corrective action program (CAP) was generally effective and supported nuclear safety.</p> <p><u>Effectiveness of Problem Identification</u></p> <p>The inspectors reviewed a large sample of issue reports, causal evaluations, audits, and NRC-identified issues to assess the licensee's documentation of issues in the CAP. The inspectors ensured the issue reports were complete, accurate, and documented in a timely manner. The causal products were reviewed to ensure identification of root and contributing causes of the issues/events. The inspectors also evaluated the licensee's identification of negative trends associated with human performance or equipment performance that could potentially impact nuclear safety. Finally, the inspectors reviewed NRC-identified issues to determine if prior opportunities existed to identify the problems.</p> <p>Based on the samples reviewed, the team concluded that generally the licensee identified issues at a low threshold and entered these issues into the CAP. The team determined that the licensee usually entered problems into the CAP completely and accurately. However, the team noted in interviews that writing a condition report was not the default method for many when they raised safety concerns, and some individuals indicated that they had not or did not frequently write condition reports, opting to inform their supervisors instead. The team did not identify any examples of issues raised to supervision that were not captured in the CAP. Further, all individuals indicated that they would be willing to write condition reports, as needed. However, this gap in utilizing the corrective action program to enter issues could ultimately impact the effectiveness of the licensee's ability to evaluate, resolve, and trend issues, which could potentially lead to more significant concerns. The team also noted that in some audits and self-assessments performed internally and by external organizations, including the NRC, examples were identified where condition reports were not entered into the CAP for issues. These examples further supported the gap found by the inspectors during the interviews. The licensee has taken actions to evaluate the gap in AR initiation and conduct site-wide information sharing on the importance of the CAP and how to initiate issue reports.</p> <p>The inspectors determined that the station was generally effective at identifying negative trends that could potentially impact nuclear safety. However, through a review of CAP evaluations (CAPEs) and root cause evaluations for impactful equipment deficiencies and failures, the inspectors did note a potential negative trend in the licensee's incorporation of vendor recommendations into site maintenance procedures. The inspectors focused on issues that caused equipment failures and the identified causes of those failures. This issue is documented in this report as a Green finding.</p> <p>The team also performed a 5-year review of the reactor core isolation cooling (RCIC) system issues. As part of this review, the team interviewed engineers, reviewed the system health and maintenance rule information, and reviewed selected corrective actions and condition evaluation documents. The team concluded that issues with RCIC were identified and entered into the CAP at a low threshold and were resolved in a timely manner commensurate with their safety significance. Some equipment deficiencies/failures reviewed for this system contributed to the inspectors' identification of a potential negative trend in the licensee's incorporation of vendor recommendations into maintenance practices for the system as</p>	

described in the finding referenced above.

Effectiveness of Prioritization and Evaluation of Issues

The inspectors reviewed items in the CAP to ensure thorough and timely evaluation of identified issues, including disposition of operability and reportability issues. Causal products were evaluated for consideration of extent of condition and cause associated with identified root and contributing causes. These products were also reviewed for consideration of potential generic implications, common cause concerns, and evaluation of previous occurrences of issues.

Based on the samples reviewed, the team determined that licensee performance was generally effective at prioritizing and evaluating issues commensurate with the safety significance of the identified problem. The station ownership committee and the management review committee meetings were generally thorough and intrusive in reviewing issues and prioritizing actions. In addition, the team observed a healthy dialogue between the members of these committees and the members challenged each other when dispositioning issues.

In general, once a degraded or non-conforming condition was identified, the CAP directed that an equipment operability or functionality review be performed. As a result, most of the samples reviewed were evaluated appropriately and in a timely manner. However, the team did identify one example of a condition report that had a less than adequate evaluation of operability of an ASME code class valve with a pinhole leak. This issue has been determined to be a minor violation and is documented in this report.

Effectiveness of Corrective Actions

The inspectors reviewed issues in the CAP to ensure appropriate classification and prioritization of the problem's resolution commensurate with the safety significance of the issue. Corrective actions were assessed to ensure they were appropriately focused to correct the problem identified and to address the root and contributing causes of significant conditions adverse to quality and conditions adverse to quality. The inspectors reviewed completion of corrective actions to validate they were completed according to the action plan, in a timely manner, and were effective at addressing the issue and preventing future issues. For NRC-identified issues, the inspectors evaluated whether prior attempts by the licensee to remedy the problems were adequate.

Based on the samples reviewed, the team determined that the licensee was generally effective in corrective action implementation. Problems identified using a root cause or other cause methodologies were resolved in accordance with CAP requirements. However, the team identified several examples where corrective actions were not fully implemented to address identified deficiencies. Based on these examples, the inspectors emphasized the importance of timely resolution of issues per a prescribed plan. The inspectors identified one example of untimely identification and resolution of an issue associated with a failure of the standby gas treatment (SBGT) system and evaluated it to be of more than minor significance. It is documented in this report as a Green NCV. The inspectors also identified two other examples of less than adequate implementation of corrective actions for identified equipment deficiencies that are described in the minor performance deficiencies below:

(1) The inspectors identified a minor performance deficiency for the licensee's failure to follow work order steps for the station blackout (SBO) equipment walkdowns. Specifically, as a

result of a fire on the Unit 1 isolimiter in 2020, and based on operating experience from other sites that encountered similar failures, work order steps were added to periodic walkdowns of the SBO area to include recording decibel levels near the SBO isolimiters and inverters. This data could be then tracked and trended to identify potential degradation of the components prior to failure. From a review the inspectors conducted of the seven walkdown work orders performed between 2020 to 2022, only one set of decibel levels were recorded; even though all the work orders asked for recording decibel levels. Another fire and isolimiter failure occurred on Unit 2 in 2021. By not fully implementing the work order steps for data collection, the licensee did not effectively take corrective actions from the first failure to potentially prevent or mitigate a second failure. The licensee also did not appropriately implement those corrective actions after the second failure. The inspectors discussed this issue with the licensee and the licensee captured it in the CAP program as Action Request (AR) 4525573, "NRC PI&R ID: Walkdown Data not Recorded in Entirety." The inspectors determined it was a minor issue because the corrective actions were intended to proactively identify degradation of the isolimiter prior to failure; however, the actions on their own would not have prevented future failures. The risk consequence and impact of the SBO isolimiter failures were also very low.

(2) The inspectors identified a second minor performance deficiency for the licensee's failure to follow self-imposed standards in Constellation procedure, PI-AA-125, "Corrective Action Program." Specifically, corrective actions developed to address a hole in the 'B' CCST did not follow the SMARTER Criteria in the CAP procedure. The inspectors reviewed the causal evaluation for the issue and corrective action plan for addressing the identified causes. The inspectors then performed walk-downs of the CCST. It was observed that the tank caulking was cracking and missing at the interface of the tank and foundation. The inspectors questioned the licensee on the implementation of the corrective actions from the CAPE since the walkdown revealed deficiencies that should have been addressed as a result of those actions. The licensee had replaced caulking around the tank in certain areas but not as a holistic replacement in response to the event. From discussions with licensee staff, it was determined that the intent of the written corrective action plan was different than what was documented in the CAPE. Also, based on the inspectors' walkdown, the actions that were taken were not fully effective at identifying degradation of the tank caulking. The licensee captured this issue in AR 4524120, "NRC PI&R ID: Caulk Missing between 'B' CCST and Foundation," and AR 4524861, "NRC PI&R ID: Change Scope of PMRQs 166690-03 and 166691-03." The inspectors determined it was a minor issue because the identified caulking deficiencies did not have an impact to the overall structural integrity of the tank to foundation boundary.

Assessment	71152B
<p>The inspectors reviewed the licensee's operating experience program to ensure items are adequately evaluated for applicability, and applicable lessons learned are communicated to appropriate organizations and implemented as appropriate.</p> <p>Based on the samples reviewed, the team determined that licensee's performance in the use of operating experience was generally effective. The licensee screened industry and NRC operating experience information for applicability to the station. When applicable, actions were developed and implemented to prevent similar issues from occurring. Operating experience lessons learned were communicated and incorporated into plant operations. The team observed the information being used in daily activities, such as pre-job briefs, as well as issue reviews and investigations. The team did not identify any concerns in this area.</p>	

Assessment	71152B
<p>The inspectors reviewed a sample of completed self-assessments and audits conducted by licensee personnel, corporate personnel, the nuclear oversight group, and external organizations. The products reviewed included assessments of each of the cornerstone areas and CAP specific items.</p> <p>Based on the samples reviewed, the team determined that the licensee's performance of self-assessments and audits was generally effective. The licensee performed department self-assessments and nuclear oversight audits throughout the organization on a periodic basis. These self-assessments and audits were generally effective at identifying issues and enhancement opportunities at an appropriate threshold. The self-assessments and audits reviewed by the team identified issues that were not previously known, including issues within the CAP itself. The team did not identify any concerns in this area.</p>	

Assessment	71152B
<p>The team interviewed approximately 75 individuals that had varying roles and levels of responsibility within the organization. These interviews included a conversation with the site's employee concerns program manager. The team also observed the most recent nuclear safety culture review meeting and reviewed minutes from prior meetings. Finally, the team reviewed the results from the 2021 employee organizational health survey and internal audits/assessments of the site's safety culture. The team focused their questions on individual's willingness and ability to identify issues, freedom from potential retaliation for raising safety concerns, effectiveness of the CAP at resolving issues, and individual involvement and drive to ensure proper resolution of issues.</p> <p>The team did not identify any impediment to the establishment of a safety conscious work environment. Individuals felt free to raise safety concerns at all levels and through various avenues without fear of retaliation. If issues were not resolved appropriately, individuals would advocate for proper resolution as needed. The staff interviewed believed that operational issues and issues with high safety significance were being appropriately addressed in a timely manner.</p> <p>As mentioned in the Identification section of this report, the team noted in interviews that writing a condition report was not the default method for many when they raised safety concerns, in those cases opting to notify their supervisor instead. While some individuals indicated that they had not or did not frequently write condition reports, all individuals indicated that they would be willing to write condition reports, as needed. This gap in directly utilizing the corrective action program appeared to have roots in previous negative experiences in the CAP, a belief that issues could be resolved timelier and effectively outside of the process, and potentially a lack of support/advocacy for issues once they were outside of the individual's immediate realm of influence. This information was discussed with licensee management for further consideration in the site's efforts to address the identified gap in issue report initiation.</p>	

Failure to Incorporate Vendor Recommendations into Preventative Maintenance Procedures			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000265/2022013-01 Open/Closed	[P.4] - Trending	71152B
<p>A self-revealed finding of very low safety significance (Green) was identified for multiple examples of the licensee failing to incorporate vendor recommendations into preventative maintenance procedures, resulting in the failure of multiple risk-significant components.</p> <p><u>Description:</u></p> <p>During the 2022 Problem Identification and Resolution biennial team inspection, inspectors reviewed three examples of equipment failures and assessments that determined causes of the issues were a failure to ensure vendor recommendations were properly incorporated into preventative maintenance plans and procedures.</p> <ul style="list-style-type: none"> • During a self-assessment of the instrument air system conducted in December 2020, the licensee identified that a vendor recommended action to replace the drain solenoid for the 1/2 B instrument air compressor was not incorporated into the maintenance program. • During a Unit 2 RCIC flow rate test on March 12, 2021, the pump tripped on mechanical overspeed. The cause was determined to be failure to consider vendor recommendations in the replacement frequency of the electronic governor - mechanical (EG-M). • On July 4, 2022, the Unit 2A feedwater regulating valve (FRV) failed closed resulting in a manual scram. The root cause was foreign material in the hydraulic oil in the valve servo. The licensee discovered that vendor recommendations for particulate concentration in oil additions and for replacement of the in-line filters were not incorporated into the maintenance program. <p>Constellation procedure ER-AA-200, Preventative Maintenance Program, Revision 6, step 4.3.3 states that "...in order to help develop the Maintenance Strategy, [performance centered maintenance] PCM templates are developed by the [corporate subject matter expert] CSME based on...vendor recommendations..." Further, step 4.3.4 states that "it is the responsibility of the [site subject matter expert] SSME or Strategic Engineer to ensure that there is an effective Maintenance Strategy for all Critical and Non-Critical Components based on...vendor recommendations..." For all these examples, the licensee's failure to incorporate vendor recommendations into the maintenance procedures for the equipment led to specific component failures.</p> <p>Corrective Actions: For the instrument air system, the licensee created a corrective action to incorporate replacement of the drain solenoid into the maintenance work order.</p> <p>For the RCIC pump, the licensee immediately replaced the EG-M and restored system operability. Another corrective action was initiated to update the PCM template to replace the EG-M within the vendor recommended frequency.</p> <p>For the 2A FRV, the licensee replaced the valve internals and initiated corrective actions to update their preventative maintenance program to incorporate the vendor's recommended oil particulate values for oil changes and replacing the in-line filters on a specific frequency.</p>			

Corrective Action References: AR 4347896, AR 4509196, AR 4408543

Performance Assessment:

Performance Deficiency: The failure to incorporate vendor recommendations into preventative maintenance procedures was a performance deficiency. Specifically, Constellation procedure ER-AA-200, Preventative Maintenance Program, Revision 6, step 4.3.4 contains guidance "to ensure that there is an effective Maintenance Strategy for all Critical and Non-Critical Components based on...vendor recommendations..." However, an effective maintenance strategy, including incorporating vendor recommendations into equipment maintenance templates, was not implemented for the instrument air system, the Unit 2 RCIC EG-M, and the 2A FRV to prevent equipment failures.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance 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. Specifically, in this finding, an example was identified for the failure to replace the EG-M for the RCIC pump in the vendor's recommended time frame, which affected the reliability of that system to respond to initiating events.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors screened the issue using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and determined that this finding was of very low safety significance, or Green. In the RCIC example, the degraded condition did represent a loss of the PRA function of a single train technical specification (TS) system, however, it was not lost for greater than its TS-allowed outage time.

Cross-Cutting Aspect: P.4 - Trending: The organization periodically analyzes information from the corrective action program and other assessments in the aggregate to identify programmatic and common cause issues. Specifically, the licensee failed to identify a trend, from an aggregate review and analysis of corrective action program evaluations and other assessments, of not incorporating vendor guidance into their preventative maintenance strategies.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

Failure to Identify and Correct a Condition Adverse to Quality Resulting in Both Trains of Standby Gas Treatment being Rendered Inoperable and Non-Functional

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000254,05000265/2022013-02 Open/Closed	[P.4] - Trending	71152B

A self-revealed finding and associated non-cited violation (NCV) of very low safety significance (Green) was identified for the licensee's failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to take corrective actions to address identified drain line blockages and water accumulation in the main chimney, which

eventually accumulated in the common discharge line of the standby gas treatment system to the point where both trains of the system could no longer fulfill their safety functions.

Description:

On July 4, 2022, Quad Cities Unit 2 scrambled due to a transient in the feedwater system. In response to the scram, the standby gas treatment (SBGT) system automatically started on low reactor water level (as designed). However, the operators noted degraded and oscillating flow on the discharge side of the in-service train. Operators manually started the redundant train and it also indicated degraded and oscillating flow. Both trains were declared inoperable and unavailable, which led to Units 1 and 2 entering 1 hour limiting condition of operation (LCO) action statements that subsequently led to both units entering 12-hour shutdown LCOs.

During this time, operations conducted troubleshooting that identified a partial blockage in the 24-inch common discharge line from both trains of SBGT to the main chimney. The main chimney drain lines were also identified to have blockages. Data trending showed improved system performance once all the blockages were removed to the point where system flows returned to within the required technical specification (TS) flow values. The SBGT subsystems were declared operable after successful surveillance runs were performed (within the 12-hour shutdown window). The licensee also completed an operability evaluation to assess the condition of water accumulation in the common discharge line. This engineering change (EC 637081) was approved and included compensatory and corrective actions to: 1) remove the identified main chimney drain line blockages; 2) return to a monthly SBGT surveillance frequency to monitor the system operation for potential degradation (changed from every 6 months prior to the event); and 3) added a step to the surveillance procedure to collect data on the SBGT system flow damper position, which would provide indication of margin to the TS required flow rate and correlate to water accumulation in the discharge line.

In response to this event, the licensee conducted a root cause evaluation to determine the cause(s) of the water accumulation in the SBGT common discharge line. As described above, the SBGT system consists of two trains (the 1/2A and 1/2B) that share a common 24-inch discharge line that runs underground to the main chimney. Initial troubleshooting efforts identified that a partial blockage in the 24-inch common discharge line existed due to water intrusion and that blockage was the cause of the degraded system flow. Water intrusion into the SBGT system 24-inch common discharge line was determined to potentially come from two sources: 1) condensation from the main chimney area; or 2) groundwater intrusion from a flaw in the wall of the buried common discharge line pipe section. A review of historical condition reports and work orders identified multiple instances of water build-up in the main chimney due to main chimney drain line blockages with CRs dating back to 2004, and 2005. At that time, there were no work orders created or conducted to document draining of the main chimney drain lines. In 2010, work orders were created to fix the drain line blockages and the identified structural integrity issues with the main chimney that allowed water intrusion but those were never completed. Additionally, there was no initiation of periodic inspection/cleaning of these drain lines between 2010, and July 2022, when the lines had to have blockages removed as part of the response to the July 4 event. It was not recognized that not addressing the drain line blockages for prolonged periods of time would allow for the condensation occurring in the main chimney to be a significant contribution of water to the SBGT discharge line. The licensee concluded that the most likely source of the water intrusion for this event was slow accumulation of water from the main chimney area into the SBGT common discharge line.

Corrective Actions: The licensee cleared the water accumulation in the 24-inch common discharge line and the blockages and drained water from the main chimney drain lines. The licensee also completed the operability evaluation for continued assurance of operability of the system with compensatory measures in place. Additional corrective actions included performing periodic checks of the main chimney drains to remove what is currently considered the primary source of water to the SBTG discharge line. The second corrective action was to identify and isolate any source of water intrusion into the SBTG underground discharge line. Further corrective actions included a periodic inspection and removal of water from the SBTG system underground section of the common discharge line to the main chimney and enhancements to the SBTG surveillance procedures.

Corrective Action References: AR 4509198, Both Trains of SBTG not Producing Required Flow

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to identify and correct a condition adverse to quality associated with drain line blockages and water accumulation in the main chimney, which eventually accumulated in the common discharge line of the SBTG system, was a performance deficiency. Specifically, the failure to correct the condition led to the slow accumulation of water from the main chimney area into the SBTG common discharge line and affected the safety function of both trains of the system.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC and Barrier Performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, failure to identify and correct water accumulation in the SBTG common discharge line led to emergent inoperability and non-functionality of the system when it was required to perform in service.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors screened the issue using IMC 0609, Appendix A, Exhibit 3, "Barrier Integrity Screening Questions," and determined that this finding was of very low safety significance, or Green, by answering "yes" to section D, "Control Room, Auxiliary, Reactor, or Spent Fuel Pool Building," question 1, "does the finding only represent a degradation of the radiological barrier function for the...SBTG system?" The degradation of the SBTG system for this issue could not have resulted in a potential substantial overexposure and was not expected to have an impact on the large early release frequency (LERF).

Cross-Cutting Aspect: P.4 - Trending: The organization periodically analyzes information from the corrective action program and other assessments in the aggregate to identify programmatic and common cause issues. Specifically, the licensee failed to identify a potential trend of degradation and issues related to the structural integrity of the main chimney. The inspectors identified multiple condition reports and work orders that were generated in the corrective action program from 2004, to the event in 2022 that documented degraded structural integrity of the main chimney and drain lines. The work orders that were generated for the condition reports were still open at the time of the event to address the identified deficiencies. Also, sufficient data was not collected during the surveillance runs of the SBTG system to identify a degraded trend in the system performance. This was noteworthy during this time frame because the surveillance test

frequency was extended from monthly to every 6 months with no additional monitoring or data collection mechanisms in place to assure the surveillance frequency change was appropriate.

Enforcement:

Violation: Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.

Contrary to the above, from September 2004 until July 4, 2022, the licensee failed to promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to take corrective actions to address water intrusion into the SBT line from the identified drain line blockages and water accumulation in the main chimney, which eventually accumulated in the common discharge line of the SBT system to the point where both trains of the system could no longer achieve its technical specification required flow rates. This was revealed when the system was automatically actuated in response to a plant transient.

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

Minor Violation

71152B

Minor Violation: The inspectors identified a minor violation for the licensee's failure to follow Constellation procedure, OP-AA-108-115, "Operability Determinations." Specifically, while reviewing condition report AR 4432559 for a pinhole leak on the 2-1402-72, Unit 2 core spray keep fill discharge valve, the inspectors noted that the component was determined to be operable but non-functional. The licensee determined the ECCS keep fill system could not perform its function because the identified leak on the valve was unisolable. However, the licensee only considered the effect this would have on the core spray system operability and did not appropriately review the operability of the valve, an ASME code class component, per the applicable ASME code requirements. Constellation procedure, OP-AA-108-115, "Operability Determinations," Attachment 3, establishes the requirements for conducting operability determinations. This attachment specifically provides guidance for conducting operability reviews of code class components when various structural integrity issues are identified. In response to the identified leak, the licensee did enter the applicable LCOs (per the TRM) to conduct repairs to the valve that day.

Screening: The inspectors determined the performance deficiency was minor. The inspectors determined the performance deficiency was minor. Specifically, the inspectors screened the performance deficiency in accordance with Inspection Manual Chapter 0612, Appendix B, and despite the operability evaluation screening the component as operable, the system was still promptly isolated and declared inoperable under TRM requirements for the ECCS keep fill system. The valve was repaired and restored to operable within the LCO-allowed outage time.

The licensee entered this issue into their CAP as AR 4527063, NRC PI&R ID Issue Report 4432559 Operability Basis.

Enforcement: Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, the licensee failed to follow procedure OP-AA-108-115, "Operability Determinations," when assessing a leak on the Unit 2 core spray keep fill discharge valve, 2-1402-72. This failure to comply with 10 CFR 50, Appendix B, Criterion V, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Failure to Follow Operations Procedures for Lowering Reactor Vessel Water Level			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000265/2022013-03 Open/Closed	[H.9] - Training	71153

A self-revealed finding and associated non-cited violation (NCV) of very low safety significance (Green) was identified for the licensee's failure to follow operations procedures in response to lowering reactor water level due to the 2A feedwater regulating valve (FRV) failing shut. Specifically, the licensee's alarm response procedure and abnormal operations procedure directed operators to initiate an emergency power reduction in response to the lowering reactor water level; however, the operators took different actions to try to manually control the 2B FRV. As a result, operators were driven to initiate a manual scram prior to an automatic one due to the continued lowering reactor water level.

Description:

On July 4, 2022, at 1:03 a.m. Quad Cities Unit 2 was operating at 100 percent power when the 2A feedwater regulating valve (FRV) failed in the fully closed position, causing a lowering reactor vessel water level. The FRV is designed with a lock-up function that prevents it from moving in the event of a failure based on position demand/deviation. However, that function has a time delay, and the valve was fully closed before the lock-up occurred. Main control room operators took manual control of the feedwater system and attempted to raise reactor water level with the 2B FRV to try to maintain it above the automatic low-level scram setpoint. Approximately 55 seconds later, reactor vessel water level reached the lower limit set by the operations response procedure and directed by the unit supervisor. Subsequently, operators initiated a manual scram. All control rods inserted, and the reactor shutdown. The licensee reported this event to the NRC under Event Notification 55975 and Licensee Event Report 2022-002-00. The licensee replaced affected components of 2A FRV and returned the unit to power on July 6, 2022.

The licensee conducted a root cause evaluation for this event. The root cause of the FRV failure was foreign material partially or completely blocking the hydraulic oil flow internal to a servo valve inside the FRV. A contributing cause to this failure was determined to be failure of the control room operators to perform an emergency power reduction in response to the lowering reactor vessel water level. This emergency power reduction could have reduced reactor power rapidly enough to a level that could be maintained with just one FRV (the 2B in this case). This particular failure mechanism of the FRV, going fully closed without locking up first, was previously unrecognized as a possible failure mode by the licensee. Because of that, through post-transient data review and interviews, it was identified that operators were unfamiliar with diagnosing the event properly as it presented itself. This led them to not take

the appropriate actions to mitigate the transient within the time frame available before the transient became unrecoverable and a manual scram was required.

As part of reviewing the licensee's event report and the root cause evaluation, the inspectors reviewed the operators' actions during the event to determine if they were appropriate and if there were any human performance issues that contributed to the event. The main control room received alarm, "Reactor Vessel Low Level," after the 2A FRV went fully closed. Quad Cities alarm response procedure, QCAN 901(2)-5, F-8, "Reactor Vessel Low Level," is the operations implementing procedure for steps to respond to this alarm. The operator actions in this procedure provide reactor scram criteria (if level cannot be maintained >11"), direct operators to validate the low-level alarm is valid (level is actually <26"), and then reduce reactor recirculation pump speeds (emergency down power) as necessary to try to maintain level between 11" and 44". From the inspectors review of the information, the operators appeared to not reference this alarm response procedure and move directly into the abnormal operating procedure for the conditions present. Quad Cities procedure, QCOA 0201-09, "Reactor Low Water Level," directs operators to perform the following Immediate Operator Actions:

C.1 Perform one or more of the following actions, based on assessment of the situation:

- Transfer from 3-element to 1-element control.
- Place online feedwater regulators in MANUAL to control Reactor water level.

C.2 Initiate Emergency Power Reduction as necessary to maintain Reactor water level between +11 inches and +44 inches.

In this transient, the operators only attempted to control reactor water level through manual control of the remaining FRV (2B). When this transient was modeled in the Quad Cities simulator post-event, an emergency power reduction could have reduced reactor power to within the capacity of a single FRV and prevented a reactor scram if performed within 30 seconds of the first alarm.

Corrective Actions: To address the contributing cause of operator performance, the licensee revised abnormal operating procedure, QCOA 0201-09, to place the step to reduce power first in the immediate actions section. The licensee also revised operator training to include similar scenarios and emphasize the importance of reducing power.

Corrective Action References: AR 4509196, 2A FRV Failed Close, Unit 2 Manual Scram Inserted on Low Reactor Water Level

Performance Assessment:

Performance Deficiency: The failure to follow the steps of the alarm response procedure and the abnormal operating procedure to perform an emergency power reduction in response to lowering reactor vessel water level was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of operators to initiate an emergency power reduction in response to the 2A FRV failing closed resulted in the necessity to manually scram the reactor due to lowering water level.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors screened the issue using IMC 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," and determined that this finding was of very low safety significance (Green) because although it caused a scram, it did not also result in the loss of mitigating equipment.

Cross-Cutting Aspect: H.9 - Training: The organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values. Specifically, this failure mechanism of the FRV, going fully closed without locking up first, was previously unrecognized as a possible failure mode by the licensee. Because of that, operators misdiagnosed this event by not properly assessing all available indications. This led them to not take the appropriate actions to mitigate the transient within the time frame available before the transient became unrecoverable and a manual scram was required.

Enforcement:

Violation: Quad Cities Technical Specification Section 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. NRC Regulatory Guide 1.33, Revision 2, Appendix A, Section 5 addresses "Procedures for Abnormal, Off-normal, or Alarm Conditions."

The licensee established Quad Cities alarm response procedure QCAN 901(2)-5, F-8, "Reactor Vessel Low Level," Revision 11, to address plant conditions associated with a low water level in the reactor vessel. This includes Step 3 which directs operators to reduce reactor recirculation pump speeds as necessary to try to maintain water level between 11" and 44" prior to reaching the level threshold for initiating a manual scram. Quad Cities abnormal operating procedure QCOA 0201-09, Revision 28 (in effect at the time), Step C.2 of the "Immediate Operator Actions" section, also directs operators to initiate an emergency power reduction as necessary to maintain reactor water level between 11" and 44".

Contrary to the above, on July 4, 2022, the licensee failed to implement either Step 3 of QCAN 901(2)-5, F-8, or Step C.2 of QCOA 0201-09 to initiate an emergency power reduction in response to lowering reactor vessel water level. As a result, operators needed to initiate a manual scram for Quad Cities Unit 2 based on reactor water level continuing to lower.

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 October 7, 2022, the inspectors presented the biennial problem identification and resolution inspection results to Mr. B. Wake, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Corrective Action Documents	1015222	Main Stack Leaking - Icicle Formation South Side	01/12/2010
		2633585	OPEX Review - Confined Space	03/01/2019
		2710067	Dresden Station Blackout Failure Analysis Report Applicable to QDC	08/30/2016
		318706	Chimney has Water Leaking Out	03/30/2005
		4030236	Base AR for Operating Experience Reviews	2017-2019
		4104474	QDC Review of Hatch OE, 4kV Breaker Failed to Close	02/15/2018
		4116642	U2 1C Inboard MSIV Slow to Close during QCOS 0250-04	03/19/2018
		4280384	NOS Finding: FP Surveillance Program	09/18/2019
		4301438	Cyber Security Workflows and Additional Steps	12/04/2019
		4310554	U1 SBO Isolimiter Fire	01/16/2020
		4322001	Base AR to Review Operating Experience	2020-2025
		4324419	Intentionally Abbreviated Maint. on U1 HPCI Converter	03/06/2020
		4335396	Unit 2 Main Generator Negative Sequence	04/14/2020
		4356663	NOSA-QDC-20-09 QDC External Event and Emergency OPS Audit	09/07/2020
		4359448	NOS ID: Detached Conduit Support on East Ext. RB Wall by SBO	07/28/2020
		4359461	NOS ID: Oil Leak on 2A SBO DG Engine Near Lube Oil Strainer	07/28/2020
		4359474	NOS ID: Oil Leak from Engine Head Cover on U2 SBO DG	07/28/2020
		4359480	NOS ID: Oil Leak on 2A SBO DG Engine Near Turbo Filter Assembly	07/28/2020
		4368333	Unit 2 RCIC Pump Trip during Flow Rate Test	09/09/2020
		4369686	NRC Information Notice 2020-02 FLEX Diesel Operational Challenges	09/15/2020
4380192	No Response to Quad EP NRC Practice Exercise Feedback	10/28/2020		
4391803	NRC IN 2020-04: Fire Protection Main Yard Buried Cast Iron Piping Failures	12/17/2020		
4395536	Issues Identified During Installation of U2 Tip 2	01/12/2021		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4396932	Ineffective Effectiveness Review from EFR 4280384-21	01/07/2021
		4399868	Unit Two Station Blackout Isolimiter Fire	03/05/2021
		4408543	Unit 2 RCIC Overspeed during Quarterly Surveillance	03/12/2021
		4410299	Trip of the Reserve Auxiliary Transformer, T-12, during Q1R26	03/19/2021
		4410615	'B' Contaminated Condensate Storage Tank NDE Results	03/22/2021
		4411301	NRC Inspector Questions Related to Carousel	03/24/2021
		4423071	NRC Information Notice 2021-01: Design Bases Lessons Learned for Power Operated Valves	05/11/2021
		4428172	RCIC Isolated during Performance of MA-QC-IM-1-13201	06/08/2021
		4432559	Pinhole Leak on the Core Spray 2-1402-72 Valve	06/30/2021
		4435864	NOSA-QDC-21-05 Quad Cities Corrective Action Program Audit	10/18/2021
		4438662	NRC ID: Broken Locking Pin on Bottom of Door to U2 EDG	08/03/2021
		4439282	NRC ID: Update to IR 4438662	08/04/2021
		4445201	RCIC Isolation during Performance of MA-QC-IM-1-13201	09/08/2021
		4466003	Pinhole Leaks Found at Weld for 0-5799-381 'B' HVAC Train	12/11/2021
		4479617	1/2 Emergency Diesel Generator Cooling Water Pump Not Starting	02/21/2022
		4486861	Unit 1 Fuel Failure	03/23/2022
		4506342	1/2 EDGCWP Failed to Swap to Bus 18 from Bus 28	06/19/2022
		4509196	2A FRV Failed Close, Unit 2 Manual Scram Inserted on Low Reactor Water Level	07/04/2022
		4509198	Both Trains of SGBT Not Producing Required Flow	07/04/2022
		4517997	1-1705-16A Fuel Pool Rad Monitor Trending Upward	08/21/2022
		4518521	Unable to Remove Cap on Line 2-10546B-1"-L	08/24/2022
		4518524	Unable to Achieve Full Isolation on 2B RHRSW Pump	08/24/2022
		4518585	U2 TIP Machine 2 Channel 7 Failure to Insert to Top of Core	08/24/2022
		4518621	EO ID: RB Vents Outlet Isolation Valve Open Light Out	08/24/2022
		4518783	NRC NCV 2022-002-01 IR Not Initiated for ERV	08/25/2022
		4518872	EO ID: Light Pack Stuck in Fast Charge Mode	08/25/2022

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4519031	'A' Fire Diesel Day Tank Level FAS Failure	08/26/2022
		4519640	EO ID: Door 21, Aux Electric Room to Trackway, Knob Loose	08/30/2022
		4523409	1B FRV Actual Position vs. Demand Position Deviation	09/10/2022
		4524991	Improper RP Self Brief Performed for Non-Self-Brief Area	09/27/2022
	Corrective Action Documents Resulting from Inspection	4524081	NRC PI&R ID Functional Basis Improvement Opportunities	09/22/2022
		4524120	NRC PI&R ID: Caulk Missing Between 'B' CCST and Foundation	09/22/2022
		4524723	NRC PI&R ID: Insufficient Detail to AMP B.1.20 Walkdowns	09/26/2022
		4524861	NRC PI&R ID: Change Scope of PMRQs 166690-03 and 166691-03	09/27/2022
		4525573	NRC PI&R ID: Walkdown Data Not Recorded in Entirety	09/29/2022
		4525854	NRC PI&R ID: Safety Culture Assessments Not in Passport	09/30/2022
		4526462	Cracking in Weather Seal Between B CCST and Foundation	10/03/2022
		4527063	NRC PI&R ID: Issue Report 4432559 Operability Basis	10/05/2022
		Drawings	M-22	Diagram of Service Water Piping Diesel Generator Cooling Water
	M-3215		System Pressure Test Walkdown Isometric Residual Heat Removal Service Water System	
	M-50 Sheet 1		Diagram of the Reactor Core Isolation Cooling Piping	
	M-51		Diagram of Radioactive Waste Disposal Piping Sheet 1	
	M-78		Diagram of Core Spray Piping	BK
	PMID 1846210-2		Intercooler Solenoid Valve	
	Miscellaneous		Presentation - Importance of the Corrective Action Program (CAP)	08/04/2022
		QDC-0-2022-0153	Risk Assessment - FRV Servo Valve Vulnerability	0
		QDC-0-2022-0156	Simple Issue Risk Assessment - FRV Hydraulic Skid Particulate	0
		Repair/Replacement Plan	ASME Section XI Repair Replacement Plan Per ER-AA-330-009 for the RHR System Piping	
		System Health	Unit 1 and Unit 2 Reactor Core Isolation Cooling System	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Report		
		Vendor Recommendation 00035167-01	RCIC EG-M Control Box	
		VTIP 0355, Volume 2	Digital EHC, GEK 111030	
	Operability Evaluations	4017529	NRC Concerns Associated with 1-0203-2D MSIV Actuator	06/01/2017
		4392826	Minor Freon Leak from 0-5799-2152 RCU Charging Connection	12/30/2020
		630927	Evaluate the Effect of the High Pressure Coolant Injection (HPCI) Signal Converter Span Shift on the Output to the Motor Gear Unit	0
		634416	U1 HPCI Failed to Achieve 5000 GPM at Elevated Discharge Pressure (1220 PSIG) during Performance of QCOS 2300-27, Step H.63	0
		635854	HPCI Booster Pump Recirc Line 2-23108B-1/2" Through Wall Leak	0
		EC 619951	Evaluate the Possible Drift in Closure Timing of MSIV 1-0203-2D	0-3
		EC 621198	Outboard MSIVs May Experience Slower Closure Times	0
		EC 632531	Piping Line 1-3958-6" Through Wall Leak	0 & 1
		EC 635781	N-513 Evaluation for Line 2-23018B-1/2" Through Wall	0
		EC 636103	Low Thickness Readings on the RHRSW 1-1001-65D LP Discharge Elbow	0 & 1
		EC 637081	Water Accumulation in SBGT 24-inch Common Discharge Line	01
	Procedures	CC-AA-101	Engineering Change Requests	7
		CC-AA-103-1001	Design Resource Manual	14
		CC-AA-204	Control of Vendor Equipment Manuals	13
		CC-AA-256-103	Cyber Security Requirements for Disposal of Digital Based Systems or Components	
		ER-AA-200	Preventative Maintenance Program	6
		OP-AA-101-113-1001	Station Event Free Clock (EFC) Program	24

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		OP-AA-108-115	Operability Determinations (CM-1)	24
		PI-AA-115	OPEX Review of ICES	
		PI-AA-115-1003 Att 1	Quad City Review of ICES	
		PI-AA-120	Issue Identification and Screening Process	12
		PI-AA-125	Corrective Action Program (CAP) Procedure	8
		PI-AA-125-1001	Root Cause Analysis Manual	6
		PI-AA-125-1003	Corrective Action Program Evaluation Manual	7
		PI-AA-125-1006	Investigation Techniques Manual	6
		PI-AA-126-1001-F-01	Self Assessment	
		QCAP 1500-01	Administrative Requirements for Fire Protection	46
		QCOA 0201-09	Reactor Low Water Level	29
		QCOS 1300-05	RCIC Pump Operability Test	
		QCOS 6600-43	Unit 1/2 Emergency Diesel Generator Load Test	56
		WA-AA-106	Work Screening and Processing	20
		WC-AA-101	Online Work-Control Process	32
		WC-AA-106	Work Screening and Processing	20
		WC-AA-120	Preventative Maintenance (PM) Database Revision Requirements	6
		Self-Assessments	4357127	Self-Assessment: Chemistry Instrumentation
	4363906		Instrument Air System Self-assessment and Audit	01/22/2021
	4386034		Self-Assessment: Off-Year NRC PI&R Assessment of the CAP	10/29/2021
	4388149		Pre 71111.11	10/21/2021
	4393127		Self-Assessment Clearance and Tagging	11/18/2021
	4393132		Reactivity Management Performance	09/30/2021
	4393721		Self-Assessment: Foreign Material Exclusion Program	12/17/2021
	4439785-12		Biennial Fleet Safety Culture Assessment - Quad Cities Station	10/15/2021
	4468590	Pre-PI&R Readiness Assessment	06/30/2022	
	Work Orders	1301851	Main Chimney Leaking- Clean Drain Line	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1302969	Action Recommended to Address the Water in the Chimney	
		1357005	Drain Line from Chimney Loop Seal is Blocked	
		4771766	Ops PMT for U2 Tip Detector for Machine #2	02/03/2022
		4888781	CCST External Inspection	
		5102022	Pin Hole Leaks 0-5799-381 B HVAC Train	
		5215080	OPS PMT Repair Leak in Line 2-23108B-1/2"	08/03/2022
71153	Procedures	OP-AA-103-102-1001	Strategies for Successful Transient Mitigation	03
		QCAN 901(2)-5 F-8	Reactor Vessel Low Level	11
		QCOA 0201-09	Reactor Low Water Level	28