UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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June 22, 2023

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: REISSUE - QUAD CITIES NUCLEAR POWER STATION – 95001 SUPPLEMENTAL INSPECTION SUPPLEMENTAL REPORT 05000265/2023040 AND FOLLOW-UP ASSESSMENT LETTER

Dear David Rhoades:

The NRC identified that the inspection report sent to you dated June 16, 2023 (ML23167B172), inadvertently omitted one sentence from the cover letter template which discussed the details of the transition of Action Matrix columns. As a result, the NRC has re-issued the report in its entirety.

On May 4, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection Response to Action Matrix Column 2 (Regulatory Response) Inputs," and discussed the results of this inspection with Drew Griffiths, Plant Manager, and other members of your staff.

The NRC performed this inspection to review your station's actions in response to a White finding in the Mitigating Systems cornerstone which was documented and finalized in NRC Inspection Reports 05000265/2022090 and 05000265/2022091 respectively. On March 28, 2023, you informed the NRC that your station was ready for the supplemental inspection.

The NRC determined that your staff's evaluation identified the cause of the White finding. Specifically, Quad Cities Nuclear Power Station (the licensee) conducted a root cause analysis and determined that there were two root causes. The first was "Inadequate Human Performance (HU) behaviors during the planning and execution of the ERV rebuild," and the second was "The stations Preventive Maintenance (PM) structure does not ensure that all components for OPCC [Operationally Critical Components] work are tied to PMIDs that facilitate effective OPCC screening." The licensee determined that there was inadequate level of detail in the procedures used to rebuild the electromatic relief valve. In addition, the craft failed to stop when unsure and proceeded in the face of uncertainty. Because the first root cause was associated with human performance behaviors; however, there was no corrective action to preclude repetition assigned to this root cause. The second root cause was associated with preventive maintenance

structure which did not identify operationally critical components to ensure an adequate level of detail in work documents and supervisory oversight. The corrective actions associated with the causes identified include actions to improve nuclear professionalism behaviors as well as reviews of maintenance items to ensure they are structured appropriately with the correct classification to ensure the appropriate levels of detail and oversight.

The inspectors concluded that the licensee had adequately determined the root and contributing causes and had appropriate actions in place to address the causes identified.

The NRC determined that completed or planned corrective actions were sufficient to address the performance issue that led to the White finding previously described. Therefore, the performance issue will not be considered as an Action Matrix input following the conclusion of the debrief conducted on May 4, 2023. Based on the results of this inspection and our Action Matrix assessment, the NRC has determined that Quad Cities Unit 2 transitioned to the Licensee Response Column (Column 1) of the Action Matrix on May 4, 2023, considering the absence of additional Action Matrix inputs.

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

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

Sincerely,

Signed by Ruiz, Robert
on 06/22/23

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

Docket No. 05000265
License No. DPR-30

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

Letter to David P. Rhoades from Robert Ruiz dated June 22, 2023.

SUBJECT: REISSUE - QUAD CITIES NUCLEAR POWER STATION – 95001 SUPPLEMENTAL INSPECTION SUPPLEMENTAL REPORT 05000265/2023040 AND FOLLOW-UP ASSESSMENT LETTER

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000265
License Number:	DPR-30
Report Number:	05000265/2023040
Enterprise Identifier:	I-2023-040-0004
Licensee:	Constellation Nuclear
Facility:	Quad Cities Nuclear Power Station
Location:	Cordova, IL
Inspection Dates:	May 01, 2023 to May 04, 2023
Inspectors:	C. St. Peters, Senior Resident Inspector D. Tesar, Senior Resident Inspector
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 95001 supplemental 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

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

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
NOV	05000265/2022090-01	02-0203-3B Electromatic Relief Valve Failed to Operate During As-Found Testing During Refueling Outage Q2R26	95001	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 – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

95001 - Supplemental Inspection Response to Action Matrix Column 2 (Regulatory Response) Inputs

The inspectors reviewed and selectively challenged aspects of the licensee's problem identification, causal analysis, and corrective actions in response to the Unit 2, 2-203-3B electromatic relief valve failure to operate on March 21, 2023, as documented in NRC Inspection Reports 05000254/2022090 and 05000265/2022090 and Licensee Event Report (LER) 265/2022-001-00.

Supplemental Inspection Response to Action Matrix Column 2 (Regulatory Response) Inputs (1 Sample)

(1) **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) reviewed the licensee's corrective actions to address a White finding by performing a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection Response to Action Matrix Column 2 Inputs," at Quad Cities, Unit 2 in accordance with the reactor oversight process.

The inspectors determined that the licensee's problem identification, causal analysis, corrective actions in place, and incident reports (IR) entered into their corrective action program (CAP) sufficiently addressed the performance issue that led to the White finding.

INSPECTION RESULTS

Assessment	95001
1. Problem Identification **a. Identification:** This issue was self-revealed when the 2-0203-3B electromatic relief valves (ERV) (3B ERV) failed to operate during as-found surveillance testing on March 21, 2022. **b. Exposure Time:** The licensee determined that the 3B ERV was inoperable from April 7, 2020 until March 21, 2022.	

c. **Identification Opportunities:** The inspectors determined that the licensee had a missed opportunity to identify this issue when the 2-0203-3D ERV (3D ERV) experienced binding and failed to operate correctly in March of 2020, shortly after the original issue with the 3B ERV occurred. The inspectors identified other potential opportunities to identify the issue as documented in the report.

d. **Risk and Compliance:** The licensee conducted a risk evaluation and a review of Technical Specification (TS) impacts of the 3B ERV failure. Their risk evaluation determined that the failure of the 3B ERV was a maintenance rule functional failure (MRFF) and was reportable under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.73(a)(2)(i)(B) – "Any operation or condition which was prohibited by the plants Technical Specifications." The licensee's risk evaluation determined a slightly elevated change in core damage frequency ("delta CDF"). The NRC also conducted a risk evaluation (utilizing the Standardized Plant Analysis Risk (SPAR) Model) accounting for the ERV failure over the exposure time and determined that the delta CDF was consistent with a White finding of low to moderate safety significance.

NRC Assessment:

The inspectors determined that the licensee had completed the risk evaluation as required. The difference in the outcome between the licensee risk evaluation and the NRC evaluation was due to differences in the models used as well as the exposure time (12 months) used by the NRC in the SPAR model. The licensee's corrective actions were based upon the NRC determination of White, low to moderate safety significance. Therefore, the inspectors determined that the actions taken and/or planned adequately addressed the safety significance of the issue.

Assessment	95001

2. Causal Analysis

a. **Methodology:** The licensee initially conducted an equipment causal analysis, then subsequently conducted a root cause analysis to determine the root and contributing causes of the event. Analytical tools implemented included event and causal factors, cause and effects analysis, and TapRoot methodologies. In addition, interviews and anonymous surveys were used to solicit information from plant staff. The inspectors review concluded that the root cause analysis was the appropriate level of evaluation and that the methodologies implemented were appropriate.

b. **Level of Detail:** In general, the inspectors determined that the causal evaluation was conducted with an appropriate level of detail commensurate with the safety significance of the issue. Inspectors identified additional potential opportunities as discussed within this report. The results of the licensee's evaluation were clearly documented in the report with root and contributing causes identified and what actions were put in place to correct each of the causes.

c. **Operating Experience:** The licensee adequately identified and addressed operating experience associated with the failure of the 2-0203-3B ERV. Other events considered during this analysis included, but were not limited to:

- Quad Cities, "2-0203-3D Electromatic Relief Valve did not Operate" (2020)(IR478917)
- Quad Cities, "Electromatic Relief Valve Failed to Stroke"
- Quad Cities, "Inadequate Maintenance Risk Assessment" (incident reports (IR) 4506936)
- Quad Cities, "Carousel Lift Over Spent Fuel Pool" (IR 4442806)
- Quad Cities, "Forced Normal Reactor Shutdown due to Failure of Bearings/Bushings and Plunger in Main Steam Relief Valve" (2006)(IR 219321)
- Dresden, "Electromatic Relief Valve Actuator Failed to Actuate During Surveillance"
- Oyster Creek, "EMRV Failed to Open When Operated from the MCR"
- Waterford, "Automatic Reactor Trip Occurred While Attempting to Synchronize a Second Motor Generator Set"

There were some similarities in many of these events; however, the licensee determined that the issue was not operating experience (OE) preventable due to differences in the failure mechanism, differences in the equipment, or lack of detail associated with the previous industry event. The inspectors determined that the licensee had reasonably considered OE with one potential opportunity when considering the ERV failure to operate identified in 2020. As identified below, the licensee entered this potential missed opportunity into their corrective action program (CAP).

d. **Extent of Condition and Cause:** The inspectors reviewed the extent of condition and the extent of cause conducted by the licensee. The inspectors did not identify any issues associated with the extent of condition review but did question the scope of the extent of cause. The extent of cause was determined to apply to the three maintenance groups and the planners as they were the ones who utilized the engineering change request (ECR) process; therefore, the corrective actions were restricted to these groups. The inspectors questioned whether engineering should also be included in this population, as the engineers also initiate and disposition ECRs as well. This issue was entered into the CAP as IR 04675488, “NRC ID 95001: Formal Engineering Training for ECR Process."

e. **Safety Culture:** The inspectors reviewed the safety culture evaluation that was conducted for the root cause and performed an independent assessment by interviewing plant personnel. These interviews revealed that some plant personnel believed there is an over emphasis placed on production at the station. One example shared with inspectors demonstrated that, while senior station leadership discussed appropriate nuclear safety culture behaviors during plant meetings and pre-job briefs, they appeared to reward achieving success (i.e., job completion) regardless of contrary behaviors that were exhibited to achieve that goal. Licensee staff further stated that supervisory presence in the field was less than ideal, which results in decreased opportunity for supervisors to set and reinforce standards and appropriate behaviors.

Although the production-focused mentality was not discussed in the root cause evaluation associated with the 3B ERV failure, at the time of the 95001 inspection, the licensee was conducting an additional root cause evaluation associated with

CAP 4669057, "Loss of U1 Reactor Vessel System Inventory through CRD System Vent Valves," which identified the same production-focused mentality that was raised to the inspectors. This second root cause evaluation has since been completed and incorporates actions to address the safety culture aspects identified during the 95001 inspection. Actions to address the mindset of being overly focused on production are being taken in Root Cause 4669057 documented in corrective actions CA 4669057-51 and CA 4669057-56, both assigned to the plant manager.

NRC Assessment:

The licensee causal evaluation determined the following root and contributing causes:
Root Cause 1: Inadequate human performance (HU) behaviors were evident during the planning and execution of the ERV rebuild.
Root Cause 2: The stations preventive maintenance (PM) structure does not ensure that all components for OPCC work are tied to PMIDs that facilitate effective OPCC screening.
Contributing Cause 1: The solenoid actuator rebuild procedure did not contain adequate procedure guidance or acceptance criteria for correction of upper guide bracket warping or installation of plunger well plastic guides.
Contributing Cause 2: Lack of communication between electrical maintenance (EM) first line supervisors (FLS), EM technicians, and EM planners regarding incorporation of ECR into the work package.
Contributing Cause 3: EM supervisors failed to provide effective oversight of work affecting quality of safety-related components.

Based upon discussions with licensee staff, there is evidence of a prevailing mindset which overemphasizes production over the demonstration of nuclear safety culture behaviors at the station. Personnel also expressed that there is a lack of supervisors in the field setting and reinforcing high standards and appropriate behaviors.

While not addressed in the root cause evaluation for the failure of the 3B ERV, as mentioned above, this was identified by the licensee in Root Cause 4669057 "Loss of U1 Reactor Vessel System Inventory through CRD System Vent Valves," which was ongoing for a subsequent issue. Actions to correct the condition are being taken in that root cause.

The inspectors identified additional questions in the following areas:

- The inspectors questioned whether it would be appropriate to incorporate design/dimensional clearance checks into the actuator rebuild procedure to eliminate the possibility of binding. The revisions which had already been incorporated into the applicable procedures focused on the proper orientation of the guides. Although this was a contributing cause (Contributing Cause 1) due to the lack of symmetry in the construction of the guides, it may not completely address the issue when considering the manufacturing tolerances of the various components. The licensee entered this into their CAP as IR 4675310.

- The inspectors questioned the actions taken by plant maintenance personnel utilizing “Action Verbs” used in the actuator rebuild procedures. Based upon questions from the inspectors, it was determined that Constellation does not have a corporate procedure, nor does Quad Cities have a site-specific procedure in which action verbs are defined. This may have contributed to a maintenance technician taking inappropriate action based upon the individual's understanding of what the action verb in the procedure was specifying (verify vs. ensure). This issue was entered into the licensee’s CAP as IR 4675200.

The inspectors provided the above feedback to the licensee. All items identified by the inspectors have been entered into the licensee's CAP. Overall, the inspectors determined that the causes identified, corrective actions taken by the licensee, and with the additional items identified by the inspectors, were appropriate for the safety significance of the issue. The inspectors noted that although the production-focused mindset at the station was missing from the initial causal evaluation, it was identified in the subsequent root cause analysis with actions included to correct the condition. Based upon the initial causal evaluations and the actions from the subsequent root cause, the inspectors determined that the licensee response was appropriate for the safety significance of the white finding.

Assessment	95001

3. Corrective Actions

a. Corrective Actions to Preclude Repetition: The inspectors concluded that corrective actions planned or taken to preclude repetition of the Quad Cities White performance issue were appropriate, timely, and commensurate with the safety significance of the issue.

(1) Completed

The corrective actions to preclude repetition have not yet been completed.

(2) Planned

(a) Root Cause #2 for this event was “The stations Preventive Maintenance (PM) structure does not ensure that all components for Operational Critical Component (OPCC) work are tied to PMID’s that facilitate OPCC screening.” Specifically, the Preventive Maintenance Identification number (PMID) for ERV actuator rebuild was a standalone PMID which was not coded as OPCC work. The actuator install was a different PMID which was screened and coded as OPCC work. The significance being that OPCC work has additional oversight and reviews performed to ensure the appropriate quality of work for operationally significant components. The corrective action to preclude repetition (CAPR) for root cause #2 is to review PMIDs for critical components which are not appropriately flagged and either tie them to a parent PMID or to tie them appropriately ensuring that they are screened and coded properly. (These reviews are being tracked via separate Action Item Tracking (ACIT) actions for each department.) The site is tracking this CAPR under action request (AR) assignment numbers 4539936-33 and 4539936-34, with a due date of August 10, 2023. The action items tied to the CAPR are to review a list of

work item PMIDs for critical components with no Equipment Identification number (EPN) tagged and add PMID to respective parent PMID via Preventive Maintenance Modification Request (PMMR), or to generate a PMMR to tie an EPN with no parent PMID.

An effectiveness review associated with this CAPR is to be completed by October 27, 2023. The site will conduct a pre-outage (Q2R27) self-assessment of OPCC screening to determine if all pre-outage and outage PMIDs for critical components have been screened for potential OPCC work.

The inspectors determined that implementation of this CAPR was timely based upon the number of items to be reviewed, as well as completion time prior to subsequent outages. The timeliness of these actions is related to the resources needed to complete each item. The action items that feed into the CAPR have varying due dates reflective of the different work groups involved. The inspectors determined that the corrective actions planned or implemented adequately addressed the root and contributing causes.

When complete, the NRC plans to inspect and assess the planned corrective action to preclude repetition as identified in ARs 4539936-33 and 4539936-34, which are scheduled for completion on August 10, 2023.

b. <u>Other Corrective Actions</u>:

(1) <u>Completed</u>

(a) The site had already completed some corrective actions prior to the root cause report being finalized, including corrective actions from the previous CAP evaluation (CAPE) as well as interim actions from the CAP associated with the root cause. Those corrective actions included marking up procedures QCEM 0200-13 and QCEMS 0250-13 to include improved upper guide bracket installation, inspection, and alignment criteria, as well as implementing purchase requirements ensuring new plungers meet the vendor specifications for Cat ID 1441792. These corrective actions were completed in AR 4330737.

Completed corrective actions related to root cause 1 included submitting training requests for development of nuclear professionalism training for delivery to all site personnel and development of targeted training for ERV rebuilds for electrical maintenance personnel. Due to root cause 1 being HU related, the site performed a risk assessment and determined no CAPRs were required. However, the nuclear professionalism training is intended to address the human performance behaviors for all site personnel, with additional targeted training for the specific groups involved. The action to develop the training has been completed although actual delivery of the training has not yet been completed.

Another completed corrective action was maintenance managers reinforcing with supervisors and planners their specific roles and

responsibilities in implementing the ECR process. This action addressed contributing cause 2.

To address contributing cause 3, actions were taken to develop a matrix for review of completed work packages to ensure proper closure (IRs written, feedback provided). Included in the matrix is a supervisory peer check and manager review for a period of 2 years.

(2) Planned

(a) The root cause for this event was determined to be inadequate HU behaviors. No corrective action to preclude repetition (CAPR) was created for root cause 1 in accordance with licensee procedure PI-AA-125-1001, "Root Cause Analysis Manual," and in alignment with human performance-based root cause precedent (2443241-04 and 2646772-11), based upon the following:

i. The root cause is human performance based.
ii. INPO Good Practice 07-006, "Human Performance Tools for Managers and Supervisors," states that there are no reliable corrective actions that can absolutely prevent recurrence of human error.
iii. Due to the inherent risk of human fallibility, future error cannot be totally eliminated.
iv. Actions are assigned to strengthen and reinforce the set of tools that manager, supervisors, and individual contributors can use to help minimize the frequency and severity of events triggered by active errors.
v. Effectiveness review is assigned to review results from the corrective action plan.

As discussed in the section above, training requests were made to deliver nuclear professionalism training to site personnel to address root cause 1. The site has staggered completion dates for this training to be delivered to all site personnel to include those already hired and with consideration for future hires. The site is also tracking a training evaluation effectiveness review following the initial rollout of the training with a due date of November 30, 2023.

Additional corrective actions are planned to address root cause 2. One CA is to ensure each task for ERV actuator rebuild is included as a pre-outage support activity under the outage work for the actuator installation to ensure correct OPCC screening. Ensuring both the ERV and the actuator are denoted as critical components along with flagging the respective tasks for additional OPCC reviews is also planned.

NRC Assessment:

The inspectors determined that the licensees proposed corrective actions were adequate to address the cause and that these actions are scheduled for completion by August 10, 2023.

The inspectors determined that overall, the licensee's problem identification, causal analysis, corrective actions taken, corrective actions planned, and IRs entered into their CAP sufficiently addressed the performance issue that led to the White finding

and met the objectives of the IP. While the site does not have a formal completion plan for the CAPR (Root Cause 2), it is being tracked under AR 4539936. The inspectors discussed with the licensee the potential for the action items associated with the CAPR to be resolved with no action taken, which could result in a CAPR with no actions to correct the significant condition adverse to quality (SCAQ). The licensee identified in procedure, PI-AA-125, “Corrective Action Program” Revision 8, that if a CAPR’s scope is changed, which would be the case if no actions were to be taken, then it is subject to review by MRC and the root cause qualified investigator or responsible manager. The inspectors identified several potential gaps which the licensee has entered into their CAP to evaluate and take actions as deemed necessary. The potential gaps identified include those mentioned previously as well as the following:

a. IR 4675473 “ERV rebuild procedure level of use evaluation” – The procedure utilized to perform the rebuild of the safety-related ERV actuators is reference use. Inspectors questioned why this would not be a “Continuous Use” procedure. The licensee response was that it met the criteria for being a reference use procedure. Inspectors pointed out that it also appeared to meet the criteria for a continuous use procedure which would be more limiting and provide additional controls. The inspectors also pointed out the significant impacts from performing the work incorrectly (White finding). The licensee initiated the above issue resolution to evaluate the condition and revise the procedure level of use as deemed necessary.

b. IR 4675449 “NRC ID 95001: ECR Process Gap” – The inspectors identified a potential gap in the ECR process where there is no procedural requirement to tie a generated ECR to the product needing to be changed. In the example associated with this event, an ECR was processed and approved, but never incorporated into the work documents. Relying solely on individuals to communicate that an ECR was initiated and where it is in the process appears to be a human performance error trap. The licensee entered this into their CAP as indicated above.

c. IR 4675446 “NRC ID 95001: Incomplete Documentation of Work” – the inspectors identified that Work Order (WO) 4804706-01 indicated that work was performed on the ERV actuator. However, this was not documented in the work package as required by attachment 2, and the maintenance procedures. This failure to document work minimizes the effectiveness of the work package closeout reviews and downstream work management processes. The licensee entered this issue into their CAP as indicated above.

d. IR 4675254 “NRC ID 95001: Missed Rework Investigation for WO 4768996,” inspectors identified that in March of 2020 when the 3D ERV failed to operate, the licensee missed a potential opportunity to learn from the event by failing to recognize that the process required a rework investigation when the 3D failed to stroke. The licensee performed troubleshooting and additional maintenance on the 3D ERV valve. This event occurred on the same day as the rework on the 3B ERV. In both instances, a rework investigation could have provided additional insights into the issue. The licensee entered this issue into their CAP as indicated above.

e. IR 4675273 “NRC ID 95001: WO Missing Key Steps/Critical Steps,” the inspectors determined that the Licensee failed to follow their process and missed additional potential opportunities to prevent or mitigate the event when they failed to identify key/critical steps within their work documents. Even though the licensee failed to identify this work as OPCC work, their process would still require them to identify key/critical steps in the work instructions, that if performed incorrectly could have direct consequences and impact the operability of the component. During their review of the work documents, the inspectors identified that there were no key/critical steps identified. The licensee entered this issue into their CAP as indicated above.

Assessment	95001

4. <u>Conclusion</u>:

Inspectors reviewed the licensee’s corrective actions to address a White finding by performing a supplemental inspection utilizing Inspection Procedure 95001, “Supplemental Inspection Response to Action Matrix Column 2 Inputs,” at Quad Cities, Unit 2 in accordance with the reactor oversight process.

During the inspection, inspectors identified 4 potential additional issues of concern associated with 10 CFR 50, Appendix B, Criterion V; however, these were further examples similar to, and associated with, those already captured in the White finding and notice of violation (NOV) documented in NRC Inspection Report 05000254/2022091 and 05000265/2022091. Therefore, it was determined that no additional inspection was required to further assess those examples as they were already covered by the existing documented NOV.

The inspectors determined that the licensee’s problem identification, causal analysis, corrective actions in place, and the IRs entered into their CAP sufficiently addressed the performance issues that were identified. The inspectors determined that the inspection objectives as listed in IP 95001 were met, and that the corrective actions taken and planned adequately addressed the White finding and associated NOV. Therefore, in accordance with IMC 0305, this action matrix input will be CLOSED and no longer considered.

EXIT MEETINGS AND DEBRIEFS

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

- On May 4, 2023, the inspectors presented the 95001 supplemental inspection results to Drew Griffiths, Plant Manager, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
95001	Corrective Action Documents	CAPE 4330737	ERV 2-0203-3D Did Not Actuate	04/24/2020
		CAPE 4486294	ERV 2-0203-3B Relief Valve Failed to Actuate	04/18/2022
		RCR 04669057	Loss of U1 Reactor Vessel System Inventory through CRD System Vent Valves	05/24/2023
		RCR 4539936	Quad Cities Unit 2 3B ERV Failure Event	01/31/2023
	Engineering Evaluations	QDC-76517	Failure Analysis of: 3B Electromatic Relief Valve Solenoid Actuator	1
	Procedures	CC-AA-101	ENGINEERING CHANGE REQUESTS (ER)	7
		HU-AA-101	HUMAN PERFORMANCE TOOLS AND VERIFICATION PRACTICES	14
		HU-AA-104-101	PROCEDURE USE AND ADHERENCE	7
		MA-AA-1000-1001	KEY STEP PROCESS	0
		MA-AA-716-003	TOOL POUCH / MINOR MAINTENANCE	13
		MA-AA-716-010-1015	OPERATIONAL CRITICAL COMPONENT WORK (OPCCW) PROCESS	9
		PI-AA-125	CORRECTIVE ACTION PROGRAM (CAP) PROCEDURE	8
		PI-AA-125-1003	ROOT CAUSE ANALYSIS MANUAL	6
		QCEM 0200-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR REBUILD INSTRUCTIONS	0
		QCEM 0200-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR REBUILD INSTRUCTIONS	10
		QCEM 0200-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR REBUILD INSTRUCTIONS	11
		QCEM 0200-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR REBUILD INSTRUCTIONS	12
		QCEM 0200-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR REBUILD INSTRUCTIONS	13
		QCEMS 0250-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR INSTALLATION, REPLACEMENT, INSPECTION, AND EQ SURVEILLANCE	30
		QCEMS 0250-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR	31

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			INSTALLATION, REPLACEMENT, INSPECTION, AND EQ SURVEILLANCE	
		QCEMS 0250-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR INSTALLATION, REPLACEMENT, INSPECTION, AND EQ SURVEILLANCE	32
		QCEMS 0250-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR INSTALLATION, REPLACEMENT, INSPECTION, AND EQ SURVEILLANCE	33
	Work Orders	QCEMS 0250-13	DRESSER ELECTROMATIC SOLENOID ACTUATOR INSTALLATION, REPLACEMENT, INSPECTION, AND EQ SURVEILLANCE	03/01/2020
		WO 04804706	INSPECT/REPAIR SPARE ERV ACTUATORS PREOUTAGE (EQ)	03/20/2020
		WO 04912065	INSPECT AND REPAIR SPARE ERV ACTUATORS PRE-OUTAGE (EQ)	03/02/2021
		WO 4766980	Stroke ERV 2-203-3D 3 Times at Beginning of Refuel Outages	03/24/2020
		WO 4800206	Dresser Electromatic Solenoid Actuator Insp (EQ)	01/17/2020