UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2056 WESTINGS AVENUE, SUITE 400
NAPERVILLE, IL 60563-2657

May 6, 2025

EAF-RIII-2025-0074

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 – NRC INSPECTION REPORT NO. 05000254/2024403 AND INVESTIGATION REPORTS 3-2023-013 AND 3-2023-0015

Dear David Rhoades:

On April 16, 2025, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Quad Cities Nuclear Power Station. The purpose of the inspection was to review the circumstances surrounding a Unit 1 reactor pressure vessel (RPV) drain down event that occurred on March 28, 2023, during a refueling outage. This letter also refers to investigations conducted by the NRC's Office of Investigations (OI). The purpose of the investigations was to determine whether: 1) personnel at the Quad Cities Nuclear Plant who had knowledge of a human performance error that occurred on March 28, 2023, deliberately took action to falsify evidence about the event; and 2) whether a senior licensee manager deliberately entered incomplete and inaccurate information in the Corrective Action Program (CAP). The investigations were completed on September 11, 2024, and September 18, 2024. A factual summary of Investigations 3-2023-013 and 3-2023-0015, which substantiated willful behaviors, is provided as Enclosure 1. The enclosed inspection report presents the results of the inspection. The inspector discussed the preliminary inspection findings with you and your staff on April 16, 2025.

Based on the results of this inspection and the investigation, six apparent violations of NRC requirements were identified and are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html.

The apparent violations concerned:

1. Willful failure by a licensed reactor operator (RO) to implement procedure resulting in RPV drain down

2. Willful failure to survey and decontaminate personnel sprayed with reactor coolant

3. Willful failure by a licensed senior reactor operator (SRO) to maintain complete and accurate records related to RPV drain down event

4. Failure to document the RPV drain down event in operating logs and CAP

5. Failure to maintain complete and accurate operating logs associated with RPV drain time

6. Failure to administer fitness for duty and fatigue testing following an event

The circumstances surrounding these apparent violations, the significance of the issues, and the need for lasting and effective corrective action were discussed with members of your staff at the inspection exit meeting on April 16, 2025.

Before the NRC makes its enforcement decision, we are providing you an opportunity to (1) request a Pre-decisional Enforcement Conference (PEC), or (2) request Alternative Dispute Resolution (ADR). If a PEC is held, portions not related to the OI investigation will be open for public observation and the NRC will issue a press release to announce the time and date of the conference. **Please contact Néstor J. Féliz Adorno at 630-829-9739, or Nestor.Feliz-Adorno@nrc.gov within 10 days of the date of this letter to notify the NRC of your intended response or request.** A PEC should be held within 30 days and an ADR session within 45 days of the date of this letter.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on these matters and any other information that you believe the NRC should take into consideration before making an enforcement decision. The decision to hold a PEC conference does not mean that the NRC has determined that a violation has occurred, or that enforcement action will be taken. This conference would be conducted to obtain information to assist the NRC in making an enforcement decision. The topics discussed during the conference may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned.

In lieu of a PEC, you may also request ADR with the NRC in an attempt to resolve this issue. ADR is a general term encompassing various techniques for resolving conflicts using a neutral third party. The technique that the NRC has decided to employ is mediation. Mediation is a voluntary, informal process in which a trained neutral (the “mediator”) works with parties to help them reach resolution. If the parties agree to use ADR, they select a mutually agreeable neutral mediator who has no stake in the outcome and no power to make decisions. Mediation gives parties an opportunity to discuss issues, clear up misunderstandings, be creative, find areas of agreement, and reach a final resolution of the issues. Additional information concerning the NRC’s program can be obtained at http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html. The Institute on Conflict Resolution (ICR) at Cornell University has agreed to facilitate the NRC’s program as a neutral third party. Please contact

ICR at 877-733-9415 within 10 days of the date of this letter if you are interested in pursuing resolution of this issue through ADR.

In addition, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

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."

If you have any questions concerning this matter, please contact Néstor J. Féliz Adorno or my staff at 630-829-9739.

Sincerely,

Signed by Kozal, Jason
on 05/06/25

Jason Kozal, Director
Division of Operating Reactor Safety

Docket No. 05000254
License No. DPR–29

Enclosure:
1. Factual Summary of Investigations
   3-2023-013 and 3-2023-0015
2. Inspection Report No. 05000254/2024403

cc w/ encl: Distribution via LISTSERV®

Letter to David Rhoades from Jason Kozal dated May 06, 2025.

SUBJECT: QUAD CITIES NUCLEAR POWER STATION – NRC INSPECTION REPORT NO. 05000254/2024403 AND INVESTIGATION REPORTS 3-2023-013 AND 3-2023-0015

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Factual Summary of NRC Office of Investigations Cases No. 3-2023-013 and 3-2023-0015

On August 18, 2023, the U.S. Nuclear Regulatory Commission (NRC), Office of Investigations (OI), Region III, initiated investigation No. 3-2023-0013 to determine whether personnel at the Quad Cities Nuclear Plant (Quad Cities or licensee), who had knowledge of a human performance error that occurred on March 28, 2023, deliberately took action to falsify evidence about the event. The investigation was completed on September 11, 2024. On September 5, 2023, investigation No. 3-2023-0015 was initiated to determine whether a senior licensee manager deliberately entered incomplete and inaccurate information in the Corrective Action Program (CAP). The investigation was completed on September 18, 2024.

The first issue involves a licensed senior reactor operator (SRO) who knowingly provided inaccurate and incomplete information about the event. 10 CFR § 50.9(a), "Completeness and Accuracy of Information," requires, in part, that information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects. The investigation showed that on March 28, 2023, an (SRO) overseeing Unit 1's outage work activities became aware of a reactor pressure vessel (RPV) drain down event due to the mispositioning of approximately 177 safety-related hydraulic control units (HCU) accumulator drain valves. Despite this knowledge, for 10 days, the SRO inaccurately attributed the event to broken hoses and submitted an inaccurate CAP document (i.e., Work Group Evaluation (WGE)). The SRO did not rectify this inaccurate information until April 7, 2023. Through the SROs sworn testimony and admission, he was aware of the facts of what happened on March 28, 2023, and admitted to investigators that he submitted an incomplete and inaccurate WGE to the licensee. In his testimony, the individual stated he knew the submitted WGE was false when he sent it. The SRO said fear of a particular senior manager's anger kept him from providing complete and accurate information.

The second issue pertains to a reactor operator's (RO's) reckless disregard for procedural compliance, which resulted in the RPV drain down event. Technical Specification 5.4.1, "Procedures," requires, in part, that written procedures shall be established, implemented, and maintained as covered in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Section 1, "Administrative Procedures," covers procedures for procedure adherence, as well as authorities and responsibilities for safe operation and shutdown. Section 4, "Procedure for Startup, Operation, and Shutdown of Safety-Related BWR Systems," cover procedures for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation for the CRD system. The licensee established procedure QCOP 0500-04, "Inserting Manual Scrams," Revision 14, as a continuous use procedure of the CRD system to provide instructions for inserting a full manual scram when the reactor is shutdown. Step D.5 states, in part, that "Inserting a scram with the CRD drain valves open will result in a drain path from the vessel." Step F.2.b(3) requires, in part, closing all 177 safety-related HCU accumulator drain valves per Attachment B, which requires either a concurrent or independent verification that each valve is closed. After reviewing the investigation, the NRC concluded that a willful (careless disregard) failure of Technical Specification 5.4.1 (procedure QCOP-0500-04) occurred on March 28, 2023. Specifically, testimony from the investigation showed that during discussions about procedure QCOP-0500-04, an (RO) recognized the existence of Attachment B, directed equipment operators (EOs) not to complete the attachment and acted with reckless indifference as to the applicability of the requirement to complete the attachment in directing that the attachment not be completed. This decision resulted in the opening of the HCU accumulator drain valves without the human performance tools in Attachment B (i.e., concurrent or independent

verification), thereby creating multiple drain paths below top of active fuel (TAF) susceptible to a common mode failure. The resulting drain down led to the loss of approximately 5–6 inches of RPV inventory. A conservative estimate, one that does not account for simultaneous water injection sources, indicates that at least 1,200 gallons of reactor coolant were lost over a period of about 6 minutes.

The third issue involves a radiation protection technician (RPT) reckless disregard for procedures during the response to personnel contamination following the event. Technical Specification 5.4.1(a) specifies written procedure shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, Appendix A. Items 7.e(4), “Contamination Control,” and 7.e(7) “Personnel Monitoring,” are applicable to this activity. Licensee procedure NISP-RP-006, “Personnel Contamination Monitoring,” Revision 1, implements this requirement. Sections 5 and 6 provide the requirements and process for responding to portal monitor alarms, including performing surveys and personnel decontamination as necessary. Steps 5.7 through 5.8.4 require detailed surveys be performed with a frisker by an RPT before prescribing decontamination activities. Step 5.10 requires a whole-body count be performed for contamination on the face. Step 6.3.3 requires medical assistance for decontamination around the eyes. Interviews performed as part of the investigation showed that on March 28, 2023, at least two personnel were sprayed in the face with reactor coolant water due to the opening of the HCU accumulator drain valves and alarmed the radiologically controlled area (RCA) exit monitors. The investigation showed that a willful (careless disregard) failure of Technical Specification 5.4.1 (procedure NISP-RP-006) occurred. Specifically, testimony from the investigation showed that the RPT employed by the licensee recognized the requirements to perform a hand frisk if an individual alarmed twice, to notify the house RPT if contamination exceeded threshold levels, to conduct a whole-body count for facial contamination, and to obtain medical assistance for decontamination near the eyes. Rather than following these requirements, the RPT directed workers to shower repeatedly and take other ad hoc actions. In so doing, the RPT acted with reckless disregard for what is required by the procedure.

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000254
License Number:	DPR-29
Report Number:	05000254/2024403
Enterprise Identifier:	I-2024-403-0040
Licensee:	Constellation Nuclear
Facility:	Quad Cities Nuclear Power Station
Location:	Cordova, IL
Inspection Dates:	October 14, 2024, to April 15, 2025
Inspectors:	J. Cassidy, Senior Health Physicist S. Cavanaugh, Physical Security Inspector N. Egan, Sr. Physical Security Inspector R. Farmer, Health Physicist C. Hunt, Senior Resident Inspector T. Okamoto, Resident Inspector
Approved By:	Néstor J. Féliz Adorno, Chief Engineering and Reactor Projects Branch Division of Operating Reactor Safety

BACKGROUND

On March 28, 2023, Unit 1 was shut down for a refueling outage during which operators inserted a manual scram as part of a planned surveillance activity. Prior to the scram, plant procedures required verification that all 177 safety-related hydraulic control unit (HCU) accumulator drain valves were closed to prevent a drain path from the reactor pressure vessel (RPV). This verification step was marked as complete.

Soon after the scram, reactor coolant water was observed discharging from open HCU drain valves onto the 595-foot elevation of the reactor building. In response, operators reset the scram and stopped the water flow. The licensee later confirmed that the valves had not been closed, resulting in an unintended RPV drain down.

The U.S. Nuclear Regulatory Commission (NRC) was initially unaware of the event. The event was not documented in operating logs, not discussed during daily plant status meetings regularly attended by NRC inspectors, and not accurately documented in the Corrective Action Program (CAP). The only CAP report referred to a generic water spill, without identifying the source or addressing potential radiological contamination. The NRC became aware of the event on April 5, 2023, when inspectors followed up on information gathered at the site. This led to a formal investigation by the NRC's Office of Investigations (OI), which concluded in September 2024, and subsequent NRC inspections, which concluded in April 2025.

SUMMARY

The NRC continued monitoring the licensee's performance by conducting an NRC 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

Willful Failure by a Licensed RO to Implement Procedure Results in RPV Drain Down			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Initiating Events	Pending Apparent Violation AV 05000254/2024403-04 Open EAF-RIII-2025-0074	[H.14] - Conservative Bias	71152A
A self-revealed finding of pending significance and associated AV of TS 5.4.1, "Procedures," and TS 3.5.2, "RPV Water Inventory Control," was identified when the licensee willfully failed to implement procedures associated with the venting of the control rod drive (CRD) system. Specifically, during a refueling outage, a licensed RO demonstrated careless disregard for procedure by directing equipment operators to perform valve manipulations without using the required procedure attachment. As a result, approximately 177 HCU accumulator drain valves remained open, creating a drain path that led to a 5- to 6-inch drop in RPV level and placed the Unit in a TS-prohibited condition and in a red shutdown risk condition without required mitigating controls.			

Willful Failure to Survey and Decontaminate Personnel Sprayed with Reactor Coolant			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Pending Apparent Violation AV 05000254/2024403-05 Open EAF-RIII-2025-0074	[H.12] - Avoid Complacency	71152A
The inspectors identified a finding of pending significance and associated AV of TS 5.4.1, "Procedures," involving the willful failure to follow procedures for performing personnel contamination surveys and decontamination. Specifically, on March 28, 2023, during the RPV drain down event, at least two individuals sprayed with reactor coolant water alarmed the RCA exit monitors. In response, an RPT acted with careless disregard for procedures by failing to ensure a detailed survey was conducted before prescribing decontamination, did not require a whole-body count for an individual with facial contamination, and failed to seek medical assistance for decontaminating a worker who had been sprayed in the eye with reactor coolant.			

Licensed SRO Deliberately Failed to Maintain Complete and Accurate Records Related to RPV Drain Down Event			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-03 Open EAF-RIII-2025-0074	Not Applicable	71152A
The inspectors identified an AV of 10 CFR 50.9, "Completeness and Accuracy of Information," for the failure to maintain complete and accurate information in all material respects. Specifically, on March 28, 2023, a licensed SRO overseeing Unit 1's outage work activities became aware of an RPV drain down event due to the mispositioning of the safety-related HCU accumulator drain valves. Despite this knowledge, for 10 days, the SRO did not review the event by inaccurately attributing the water spill to broken hoses and willfully submitted an inaccurate CAP document based on this false pretense on April 6, 2023. The SRO rectified this inaccurate information on April 7, 2023. This information was material to the NRC, as it left inspectors unaware of the drain down event and the performance issues causing it within a timeframe necessary to assess appropriate event response and follow-up inspection activities.			

Failure to Document the RPV Drain Down Event in Operating Logs and CAP			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-01 Open EAF-RIII-2025-0074	Not Applicable	71152A
The inspectors identified an AV of 10 CFR 50.9, "Completeness and Accuracy of Information," for the failure to maintain complete and accurate information. Specifically, on March 28, 2023, the licensee failed to log an RPV drain down event due to the mispositioning of safety-related HCU accumulator drain valves. In addition, the licensee failed to document the Configuration Control issue into the CAP. These incomplete records were material to the NRC, as they left			

inspectors unaware of the drain down event within a timeframe necessary to assess appropriate event response and follow-up inspection activities.

Failure to Maintain Complete and Accurate Operating Logs Associated with RPV Drain Time			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-02 Open EAF-RIII-2025-0074	Not Applicable	71152A
The inspectors identified an AV of 10 CFR 50.9, “Completeness and Accuracy of Information,” for the failure to maintain complete and accurate information. Specifically, since April 11, 2023, the licensee incorrectly estimated the RPV drain time as 1 to 8 hours, when it was about 15 minutes, after assessing the RPV drain down event that occurred on March 28, 2023. As a result, they did not fully document the required TS entries and the change in shutdown risk status from yellow to red. The incomplete and inaccurate information was used by the NRC when evaluating its regulatory response to the actual RPV drain down that occurred on March 28, 2023. Had the information been maintained completely and accurately by the licensee, it would have likely caused the NRC to undertake further substantial inquiry, such as additional inspection activities, to better understand the circumstances and significance of the of the activity that led to the RPV drain down.			

Failure to Administer Fitness for Duty and Fatigue Testing Following Event			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Security	Pending Apparent Violation AV 05000254/2024403-06 Open EAF-RIII-2025-0074	[H.8] - Procedure Adherence	71152A
The inspector identified a finding of pending significance and associated AV of 10 CFR 26.31(c)(3) and 10 CFR 26.211(a)(3) for the failure to conduct post-event drug and alcohol testing and fatigue assessments. Specifically, on March 28, 2023, the licensee did not administer drug and alcohol tests to individuals after they committed human errors that may have caused, or contributed to, the Unit 1 RPV drain down event. In addition, the licensee did not perform a fatigue assessment as required in response to events that warrant post-event drug and alcohol testing.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000254/2024-001-00	LER 2024-001-00 for Quad Cities Nuclear Power Station, Unit 1, Technical Specification 3.5.2 Action Not Performed Due to Inadequate Procedure Adherence	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

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its CAP related to the following issues:

(1) The RPV drain down event that occurred on March 28, 2023.

71153 - Follow-Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

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

(1) LER 05000254/2024-001-00, "Technical Specification 3.5.2 Action Not Performed Due to Inadequate Procedure Adherence" (ADAMS Accession No. ML25021A090). The inspection conclusions associated with this LER are documented in the Inspection Results Section of this report. This LER is Closed.

INSPECTION RESULTS

Willful Failure by a Licensed RO to Implement Procedure Results in RPV Drain Down			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Initiating Events	Pending Apparent Violation AV 05000254/2024403-04 Open EAF-RIII-2025-0074	[H.14] - Conservative Bias	71152A
A self-revealed finding of pending significance and associated AV of TS 5.4.1, "Procedures," and TS 3.5.2, "RPV Water Inventory Control," was identified when the licensee willfully failed to implement procedures associated with the venting of the control rod drive (CRD) system. Specifically, during a refueling outage, a licensed RO demonstrated careless disregard for procedure by directing equipment operators to perform valve manipulations without using the required procedure attachment. As a result, approximately 177 HCU accumulator drain valves remained open, creating a drain path that led to a 5- to 6-inch drop			

in RPV level and placed the Unit in a TS-prohibited condition and in a red shutdown risk condition without required mitigating controls.

Description:

The CRD system supplies water at the required pressure to each reactor control rod HCU, ensuring proper cooling and providing the force needed for control rod insertion and retraction. Each control rod is supported by its own HCU, with 177 HCUs in total, arranged into north and south banks. Each HCU includes an accumulator drain valve resulting in 177 drain valves overall.

On March 28, 2023, during a Unit 1 planned outage activity, the licensee prepared to implement procedure QCOP 0500-04, "Inserting Manual Scrams," Revision 14, to depressurize the CRD accumulators for surveillance testing. This procedure was designated as "continuous use," governed by HU-AA-104-101, "Procedure Use and Adherence," Revision 7. When using a "continuous use" procedure, HU-AA-104-101 required performers to read each step before performing it, execute steps in sequence, and apply placekeeping before proceeding to the next step. It also directed performers to review the procedure upon completion to confirm that all steps were performed and documented.

Section 2.5 of HU-AA-104-101 defined "placekeeping" as physically marking procedure steps to prevent omission or duplication. Sections 3.2.2(1) and 4.3.1 required supervisors to provide direction on placekeeping and mandated its application to continuous use procedures. Section 4.3.2 further specified that performers must mark completion before proceeding to the next step. Section 4.1.7 required final review of the document to confirm that all steps were performed and documented.

QCOP 0500-04 included steps that open penetration flow paths below top of active fuel (TAF). Per QCAP 0260-03, "Screening for Reactor Pressure Vessel Water Inventory Control," Revision 17, these steps qualified as water inventory control activities if they reduced RPV drain time to less than 36 hours. The licensee's TS defined drain time as the time it would take for the water inventory in and above the RPV to drain to TAF at the limiting drain rate. This rate was the larger of (1) the drain rate through a single highest flow penetration or (2) the combined rate through multiple paths susceptible to a common mode failure, such as a single human error, for all penetration flow paths below the TAF. TS exceptions included flow paths that were isolated, connected to intact systems, or isolable before reaching TAF under specified conditions. TS assumed instantaneous flow path opening, no makeup water, and realistic drain rates.

QCAP 0260-03 defined a single human performance error as any incorrect or omitted action not immediately recoverable or preventable by peer or concurrent review. Step D.4.g required drain time evaluation for multiple penetration flow paths below TAF susceptible to a common mode failure, including a single human performance error that opened multiple flow paths below TAF, which was explicitly listed as an example. The procedure also required that if drain time was projected to be less than 8 hours, the actions of LCO 3.5.2 Condition D must be met prior to activity start and prohibited planned evolutions resulting in a drain time of less than 1 hour.

TS 3.5.2, "RPV Water Inventory Control," required, in part, that drain time to TAF be greater than or equal to 36 hours in Modes 4 and 5. If drain time was less than 8 hours, Condition D required operators to, in part, immediately initiate action to verify that one standby gas treatment subsystem was capable of being placed in operation. If Condition D was not met,

or if drain time was less than 1 hour, Condition E required operators to immediately initiate action to restore drain time to greater than or equal to 36 hours.

QCOP 0500-04 precaution D.5 warned that inserting a scram with CRD drain valves open would create an RPV drain path. Step F.2.b(3) required closing all 177 HCU accumulator drain valves per Attachment B, which required either concurrent or independent verification to mitigate the risk of human error. HU-AA-101, "Human Performance Tools and Verification Practices," Revision 14, stated that both concurrent and independent verifications must be documented upon completion.

Attachment B, "HCU Drain Valve Position Verification," contained a two-person verification process for closing and confirming all 177 drain valves. This process mitigated the risk of a single human performance error opening multiple drain paths below TAF and ensured the activity did not meet the criteria for common mode failure per QCAP 0260-03.

During the refueling outage, operations were organized into system coordination teams per OP-AA-117-1001, "Operations Refueling Outage Readiness and Execution," Revision 9. Each team coordinated the removal, testing, and return to service of assigned systems. On March 28, 2023, the CRD system coordination team (Group 2) held a pre-job briefing led by the licensed RO overseeing QCOP 0500-04. The RO discussed precaution D.5 of QCOP 0500-04 and prior operating experience involving inadvertently open HCU drain valves that led to an RPV drain down at the site.

Later in the pre-job briefing, the RO directed the two teams of two EOs each not to complete Attachment B of QCOP 0500-04. Under the procedure, each EO was required to independently verify and sign off on valve closures. Instead, the RO instructed the teams to informally check each other's work, citing a desire to reduce time in the field and thereby minimize radiological dose. Although the procedural method requires more field time, it serves as a control to prevent valve mispositioning. One team was assigned roughly half the valves, the other team the rest, with neither completing the required verifications.

Based on interviews, including those from the licensee's root cause evaluation, the pre-job brief led to a miscommunication. The RO assumed the EOs understood that they were to perform QCOP 0500-04 up to step F.2.b(3), but without completing Attachment B. However, the EOs understood they were to pause after step F.2.b(2), which directed them to open the valves, because step F.2.b(3) required Attachment B, which they had been directed not to implement.

Following fieldwork, one EO team returned without Attachment B because it had been contaminated. The second EO team returned with an attachment that was not filled out. The RO asked each team if all required steps were complete but did not specify which steps were being referenced. After receiving verbal confirmation, the RO signed off step F.2.b(3) without verifying that Attachment B had been completed and then notified the control room they were ready to insert a scram.

The control room operators inserted a manual scram per step F.2.d of QCOP 0500-04. Minutes later, they noted slower-than-expected RPV level recovery. In response, a control room operator manually adjusted feedwater flow to restore RPV water level, which had dropped below the control band. Field reports soon indicated water spraying from HCU drain connections. Realizing the RPV was draining to the reactor building, control room operators reset the scram to isolate the drain path.

The RO's decision to bypass the required human performance tools replaced a verified method that would have required hundreds of independent errors to misposition approximately 177 valves with an unauthorized approach vulnerable to a single error. As a result, the projected RPV drain time to TAF was reduced from over 36 hours to approximately 15 minutes. This condition violated TS 3.5.2 and procedure OU-AA-103, "Shutdown Safety Management Program," Revision 23. Step 4.4.2.4 of OU-AA-103 states that a plant overall safety status of red shall not be planned or scheduled. The RO's decision to informally plan the implementation of QCOP 0500-04 without completing Attachment B led to an unrecognized drain time of less than one hour, a condition corresponding to red shutdown safety status as defined in Attachment 1 of OU-QC-104, "Shutdown Safety Management Program Quad Cities Annex," Revision 23. Per the TS Bases, a drain time under 36 hours may not allow sufficient operator response to prevent inventory from reaching TAF.

Corrective Actions: The licensee's action to reset the scram signal approximately 6 minutes after initiation halted the inadvertent drain down that occurred on March 28, 2023. The event was not initially documented in the CAP. It was not until 14 days later, on April 11, 2023, that the licensee entered the issue into the CAP as AR 04669057 and initiated a causal evaluation.

Corrective Action References: AR 04669057, "Configuration Control During QCOP 0500-04 Execution"

Performance Assessment:

Performance Deficiency: The failure to implement procedure QCOP 0500-04 was contrary to Technical Specification 5.4.1 and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more-than-minor because it was associated with the Configuration Control 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 to implement QCOP 0500-04 resulted in multiple drain paths from the RPV below the TAF, resulting in an inadvertent drain down of the RPV.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix G, "Shutdown Operations Significance Determination Process." The safety significance of this issue is pending the final enforcement decision.

Cross-Cutting Aspect: H.14 - Conservative Bias: Individuals use decision-making practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop. Specifically, the RO directed EOs not to complete Attachment B of QCOP 0500-04 to reduce field dose, without considering the safety or regulatory impact. This replaced a verified method that would have required hundreds of independent errors to misposition approximately 177 valves with an unauthorized approach vulnerable to a single error. The RO did not determine the action was safe before proceeding.

Enforcement:

The ROP's significance determination process does not specifically consider willfulness in its assessment of licensee performance. Therefore, it is necessary to address this violation which involves willfulness using traditional enforcement to adequately deter non-compliance.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: TS 5.4.1, "Procedures," required, in part, that written procedures shall be established, implemented, and maintained as covered in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Section 1, "Administrative Procedures," covered procedures for procedure adherence, as well as authorities and responsibilities for safe operation and shutdown. Section 4, "Procedure for Startup, Operation, and Shutdown of Safety-Related BWR Systems," covered procedures for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation for the CRD system.

The licensee established procedure QCOP 0500-04, "Inserting Manual Scrams," Revision 14, as a continuous use procedure for the CRD system. The procedure provided instructions for inserting a full manual scram when the reactor is shut down. Step F.2.b(3) required closing all 177 safety-related HCU accumulator drain valves per Attachment B, which included either concurrent or independent verification that each valve was closed. The use of continuous use procedures, including the requirement to perform steps in sequence, apply placekeeping, and verify completion before proceeding, was governed by HU-AA-104-101, "Procedure Use and Adherence," Revision 7. The concurrent and independent verification methods required by Attachment B were further governed by HU-AA-101, "Human Performance Tools and Verification Practices," Revision 14.

Contrary to the above, on March 28, 2023, the licensee failed to implement written procedures covering the applicable procedures recommended in Regulatory Guide 1.33. Specifically, a licensed RO directed EOs to not complete Attachment B of QCOP 0500-04, contrary to step F.2.b(3). As a result, the EOs neither performed, nor verified the closure of the valves. The RO then signed off step F.2.b(3) as complete and proceeded with the next steps without ensuring Attachment B had been completed and that all appropriate steps were performed in accordance with HU-AA-104-101 and HU-AA-101. Instead, the RO relied on verbal confirmation from the EOs that their assigned tasks were complete. This led to inadvertently establishing multiple drain paths from the Unit 1 RPV, resulting in a water level drop of approximately 5 to 6 inches.

The RO's decision to not complete the attachment caused the licensee to place Unit 1 in a condition prohibited by TS 3.5.2, which required, in part, that RPV drain time to TAF be greater than or equal to 36 hours in Modes 4 and 5. Immediate TS actions were required if drain time fell below 8 or 1 hour. Because the decision to informally plan the implementation of QCOP-0500-04 without completing Attachment B resulted in a drain time of about 15 minutes, the plant also entered a red shutdown safety level, which was not permitted by procedure OU-AA-103, "Shutdown Safety Management Program," Revision 23.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Willful Failure to Survey and Decontaminate Personnel Sprayed with Reactor Coolant			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Occupational Radiation Safety	Pending Apparent Violation AV 05000254/2024403-05 Open EAF-RIII-2025-0074	[H.12] - Avoid Complacency	71152A

The inspectors identified a finding of pending significance and associated AV of TS 5.4.1, "Procedures," involving the willful failure to follow procedures for performing personnel contamination surveys and decontamination. Specifically, on March 28, 2023, during the RPV drain down event, at least two individuals sprayed with reactor coolant water alarmed the RCA exit monitors. In response, an RPT acted with careless disregard for procedures by failing to ensure a detailed survey was conducted before prescribing decontamination, did not require a whole-body count for an individual with facial contamination, and failed to seek medical assistance for decontaminating a worker who had been sprayed in the eye with reactor coolant.

Description:

During the March 28, 2023, RPV drain down event, at least two contract workers were sprayed with reactor coolant and subsequently triggered alarms on the RCA personnel contamination monitors (PCMs).

Transcripts from the NRC Office of Investigations interviews indicate that the licensee failed to assess and quantify contamination levels on the affected individuals. The workers were sprayed with reactor coolant water over large portions of their bodies, including the face, and were instructed to wash off the contamination before any measurements were taken using a frisker. One individual reported being sprayed in the ear, eye, and mouth. Despite these exposures, the licensee did not perform whole-body counts to evaluate potential internal dose and did not seek medical assistance for decontaminating the individual who experienced contamination involving the eye.

Procedure NISP-RP-006, "Personnel Contamination Monitoring," Revision 1, governed the required response to PCM alarms. It included provisions for hand frisking if an individual alarms twice and mandated additional notifications when contamination levels exceeded threshold limits. However, the RPT directed the workers to repeatedly shower without first conducting the required surveys.

In interviews, the RPT acknowledged awareness of the procedural requirements outlined in NISP-RP-006, including the need for frisking and notification protocols following PCM alarms. Despite this, the technician directed decontamination actions inconsistent with procedural requirements.

Following the event, surveys of areas affected by the reactor coolant release identified contamination levels as high as 440,000 disintegrations per minute.

Corrective Actions: The affected workers removed the contamination using soap and water before exiting the radiologically controlled area. All individuals subsequently passed whole-body contamination monitors prior to leaving the RCA and again prior to exiting the site. These monitors are designed to ensure that no radioactive material is inadvertently

transported beyond the site boundary. Based on radiological data collected before and after decontamination of the work area, along with successful screening results from both the PCMs and portal monitors, it was reasonably concluded that the failure to implement procedural requirements did not result in unaccounted-for exposures or internal intakes that would exceed established regulatory thresholds. In addition, the licensee plans to investigate the cause of this failure to follow procedure.

Corrective Action References: AR04857728, “NRC ID: Failure to Survey in Event in IR45650406”

Performance Assessment:

Performance Deficiency: The licensee’s failure to perform personnel contamination surveys and decontamination following PCM alarms was contrary to procedure NISP-RP-006, and was a performance deficiency

Screening: The inspectors determined the performance deficiency was more-than-minor because it was associated with the Program & Process attribute of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to perform personnel contamination surveys and decontamination following PCM alarms did not ensure the workers sprayed with reactor coolant water over large portions of their bodies, including the face, were adequately protected.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix C, “Occupational Radiation Safety SDP.” The safety significance of this issue is pending the final enforcement decision.

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. Specifically, the RPT at the RCA exit control point failed to recognize the risk of known exposures. Instead of adhering to procedures, the RPT assumed the workers could successfully exit the RCA with minimal effort.

Enforcement:

The ROP’s significance determination process does not specifically consider willfulness in its assessment of licensee performance. Therefore, it is necessary to address this violation which involves willfulness using traditional enforcement to adequately deter non-compliance.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: TS 5.4.1, “Procedures,” required, in part, written procedure to be established, implemented, and maintained, covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Section 7.e(4) covered “Contamination Control” and Section 7.e(7) covered “Personnel Monitoring.”

The licensee established procedure NISP-RP-006, “Personnel Contamination Monitoring,” Revision 1, to address contamination control and personnel monitoring. Sections 5 and 6

provided the requirements and process for responding to portal monitor alarms, including performing surveys and personnel decontamination as necessary. Steps 5.7 through 5.8.4 required detailed surveys be performed with a frisker by an RPT before prescribing decontamination activities. Step 5.10 required a whole-body count be performed for contamination on the face. Step 6.3.3 required medical assistance for decontamination around the eyes.

Contrary to the above, on March 28, 2023, the licensee failed to implement written procedures covering the applicable procedures recommended in Regulatory Guide 1.33. Specifically, when at least two workers who had been sprayed with reactor coolant water alarmed the RCA exit monitors, the licensee did not perform surveys and decontamination activities in accordance with NISP-RP-006, Sections 5 and 6. An RPT failed to: 1) perform detailed surveys using a frisker before prescribing decontamination activities; 2) conduct a whole-body count for contamination on the face; and 3) ensure decontamination of the eye was performed with medical assistance.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Licensed SRO Deliberately Failed to Maintain Complete and Accurate Records Related to RPV Drain Down Event

Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-03 Open EAF-RIII-2025-0074	Not Applicable	71152A

The inspectors identified an AV of 10 CFR 50.9, “Completeness and Accuracy of Information,” for the failure to maintain complete and accurate information in all material respects. Specifically, on March 28, 2023, a licensed SRO overseeing Unit 1’s outage work activities became aware of an RPV drain down event due to the mispositioning of the safety-related HCU accumulator drain valves. Despite this knowledge, for 10 days, the SRO inaccurately assessed the event by attributing the water spill to broken hoses and willfully submitted an inaccurate CAP document based on this false pretense on April 6, 2023. The SRO rectified this inaccurate information on April 7, 2023. This information was material to the NRC, as it left inspectors unaware of the drain down event and the performance issues causing it within a timeframe necessary to assess appropriate event response and follow-up inspection activities.

Description:

On March 28, 2023, during a Unit 1 planned outage, EOs depressurized the CRD accumulators for surveillance testing using procedure QCOP 0500-04, “Inserting Manual Scrams,” Revision 14. The EOs did not close the HCU accumulator drain valves after opening them, contrary to the procedure. Subsequently, control room operators inserted a manual scram as directed by the procedure, inadvertently initiating a reactor coolant drain path from the RPV through the open valves. Soon after, field personnel reported water spraying from HCU drain connections. Upon realizing that the RPV was draining to the reactor building, control room operators reset the scram, thereby isolating the drain path.

On September 11, 2024, the NRC Office of Investigations finalized its report, “Quad Cities 1 Licensee Failed to Document an Operational Event (Case No.: 3-2023-013),” concluding that

a licensed SRO deliberately sought to conceal information about the operational event. While overseeing outage activities, the SRO became aware of the RPV drain down caused by the mispositioning of the safety-related HCU accumulator drain valves. However, from March 28 to April 7, 2023, the SRO knowingly and falsely attributed the event to failed hoses.

The SRO was assigned to perform a work group evaluation (WGE) causal analysis in accordance with licensee procedure PA-AA-125, "Corrective Action Program (CAP) Procedure," Revision 8. Step 4.3.5.1 required the SRO to document the problem that resulted in the issue, and step 4.3.5.2 directed the SRO to state the cause by explicitly answering the question, "why did the issue occur?" On April 6, 2023, the SRO knowingly submitted an inaccurate WGE to their supervisor, which included corrective actions to replace the hoses. On April 7, 2023, the SRO revised the WGE and informed their supervisor that the event had actually been caused by mispositioned HCU drain valves. Subsequently, the licensee created a new issue report under AR 4669057, documenting the Configuration Control event and the associated inadvertent RPV drain down.

Corrective Actions: The licensee canceled the WGE under AR 4565406 and performed a root cause evaluation under AR 4669057.

Corrective Action References: AR 4669057, "Configuration Control During QCOP 0500-04 Execution"

Performance Assessment: None

Enforcement:

The ROP's significance determination process does not specifically consider willfulness in its assessment of licensee performance. Therefore, it is necessary to address this violation which involves willfulness using traditional enforcement to adequately deter non-compliance.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: Title 10 CFR 50.9, "Completeness and Accuracy of Information," stated, "Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects."

Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," stated, "Activities affecting quality to 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."

The licensee-established procedure OP-AA-106-101-1001, "Event Response Guidelines," Revision 32, provided instructions for responding to significant plant issues and events. Step 4.4.2, stated, "Review the event to determine if the event is significant and if a prompt investigation is necessary. Significant equipment failures and human performance events require equal consideration for prompt investigations."

Contrary to the above, from March 28, 2023, to April 7, 2023, the licensee failed to maintain accurate information required to be maintained by the Commission's regulations in all material respects. Specifically, on March 28, 2023, an SRO overseeing Unit 1's outage

work activities became aware of an RPV drain down event due to the mispositioning of the safety-related HCU accumulator drain valves. Despite this knowledge, the SRO deliberately failed to accurately evaluate or report the event for a period of 10 days. Instead, the SRO knowingly misattributed the water spill to broken hoses and willfully submitted an inaccurate WGE on April 6, 2023, based on that false explanation. The SRO did not correct the record until April 7, 2023.

This information was material to the NRC because it resulted in inspectors being unaware of the drain down event and the associated performance issues within a timeframe necessary to assess appropriate event response and determine the need for follow-up inspection activities.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Failure to Document the RPV Drain Down Event in Operating Logs and CAP			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-01 Open EAF-RIII-2025-0074	Not Applicable	71152A

The inspectors identified an AV of 10 CFR 50.9, “Completeness and Accuracy of Information,” for the failure to maintain complete and accurate information. Specifically, on March 28, 2023, the licensee failed to log an RPV drain down event due to the mispositioning of safety-related HCU accumulator drain valves. In addition, the licensee failed to document the Configuration Control issue into the CAP. These incomplete records were material to the NRC, as they left inspectors unaware of the drain down event within a timeframe necessary to assess appropriate event response and follow-up inspection activities.

Description:

On March 28, 2023, during a planned Unit 1 outage, EOs depressurized the CRD accumulators for surveillance testing using procedure QCOP 0500-04, “Inserting Manual Scrams,” Revision 14. Contrary to the procedure, the EOs did not close the HCU accumulator drain valves after opening them. Shortly afterward, control room operators inserted a manual scram as directed by the procedure, inadvertently initiating a reactor coolant drain path from the RPV through the open valves.

Field personnel soon reported water spraying from HCU drain valves. Control room operators recognized that the RPV was draining to the reactor building and responded by resetting the scram, which isolated the drain path.

The licensee’s procedures required documentation of this event. Specifically, OP-AA-111-101, “Operating Narrative Logs and Records,” Revision 19, required control room operators to maintain logs at a level of detail sufficient to reconstruct shift activities without face-to-face turnover. Section 4.3 contained examples of information to be included in the control room logs, such as abnormal plant configurations. Additionally, OP-AA-106-101-1001, “Event Response Guidelines,” Revision 32, required Configuration Control events to be documented in the CAP through an issue report. OP-AA-108-112, “Plant Status Configuration,” Revision 13, defined Configuration Control events as those involving mispositioned plant components.

On October 15, 2024, following a review of the licensee's causal evaluation and interviews conducted by the NRC's Office of Investigations, inspectors determined that control room operators recognized the RPV drain down was caused by an abnormal plant configuration. However, they did not document the event in the control room narrative logs. Inspectors also found that multiple licensee personnel involved in the incorrect execution of QCOP 0500-04, and the subsequent recovery actions, were aware that the HCU accumulator drain valves had been mispositioned, but they did not initiate an issue report.

Corrective Actions: On April 11, 2023, the licensee documented the Configuration Control event under AR 04669057 and updated the control room logs to reflect the occurrence of the drain down.

Corrective Action References: AR 04669057, "Configuration Control During QCOP 0500-04 Execution"

Performance Assessment: None

Enforcement:

The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. Specifically, failures to log the event and document the Configuration Control issue in the CAP resulted in incomplete licensee records for activities affecting quality. These incomplete records were material to the NRC, as they delayed inspectors' awareness of the drain down event, hindering timely assessment of event response and appropriate follow-up inspections.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: Title 10 CFR 50.9(a), "Completeness and Accuracy of Information," stated "Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects."

Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," stated "Activities affecting quality to 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."

The licensee established procedure OP-AA-111-101, "Operating Narrative Logs and Records," Revision 19, as the governing procedure for log entries. Section 4.1 stated, in part, "Maintain records at a level of detail that will allow reconstruction of shift activities by oncoming personnel that do not have the benefit of a face-to-face discussion of the shift. Records are a useful aid in troubleshooting and tracking problems that may arise during the shift. Include as much information as possible for this purpose." Section 4.3 contained examples of information to be recorded in operations logs, including "abnormal plant configurations."

The licensee-established procedure OP-AA-106-101-1001, "Event Response Guidelines," Revision 32, provided guidance for responding to significant plant issues and events. Step

4.4.1, stated, “Ensure an IR [issue report] is written for the event.” Step 4.4.2 stated, “Review the event to determine if the event is significant and if a prompt investigation is necessary. Significant equipment failures and human performance events require equal consideration for prompt investigations.” Step 4.4.2 clarified that examples of a significant event include a level 1, 2, or 3 Configuration Control event.

Contrary to the above, from March 28, 2023, through April 11, 2023, the licensee failed to maintain complete information required to be maintained by the Commission’s regulations in all material respects. Specifically, the licensee did not maintain the operating logs at a level of detail sufficient to reconstruct shift activities related to the RPV drain down event, an activity affecting quality, that occurred on March 28, 2023. Furthermore, the licensee did not ensure an issue report was written, also an activity affecting quality, upon discovering that the event involved the mispositioning of the safety-related HCU accumulator drain valves. This event was later classified as a level 3 Configuration Control event. Due to the lack of issue report, the licensee did not assess whether the event was significant and required prompt investigation.

These incomplete records were material to the NRC, as they left inspectors unaware of the drain down event within a timeframe necessary to assess appropriate event response and follow-up inspection activities.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Failure to Maintain Complete and Accurate Operating Logs Associated with RPV Drain Time			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Apparent Violation AV 05000254/2024403-02 Open EAF-RIII-2025-0074	Not Applicable	71152A

The inspectors identified an AV of 10 CFR 50.9, “Completeness and Accuracy of Information,” for the failure to maintain complete and accurate information. Specifically, since April 11, 2023, the licensee incorrectly estimated the RPV drain time as 1 to 8 hours, when it was about 15 minutes, after assessing the RPV drain down event that occurred on March 28, 2023. As a result, they did not fully document the required TS entries and the change in shutdown risk status from yellow to red. The incomplete and inaccurate information was used by the NRC when evaluating its regulatory response to the actual RPV drain down that occurred on March 28, 2023. Had the information been maintained completely and accurately by the licensee, it would have likely caused the NRC to undertake further substantial inquiry, such as additional inspection activities, to better understand the circumstances and significance of the of the activity that led to the RPV drain down.

Description:

TS 3.5.2, “RPV Water Inventory Control,” required, in part, that the drain time of RPV water inventory to TAF be greater than or equal to 36 hours in Modes 4 and 5. If drain time was less than 8 hours, Condition D required operators to, in part, immediately initiate action to verify one standby gas treatment subsystem was capable of being placed in operation. If Condition D was not met or drain time was less than 1 hour, Condition E required immediate action to restore drain time to at least 36 hours.

On March 28, 2023, during a planned Unit 1 outage, an RO informally replaced a previously approved method for depressurizing the HCU accumulators with an unapproved approach that introduced a single-point vulnerability. The approved method required multiple independent errors per valve, making widespread valve mispositioning highly unlikely. In contrast, the unauthorized method allowed for the mispositioning of up to 177 safety-related HCU accumulator drain valves through a single human error. This configuration reduced the projected RPV drain time to TAF from greater than 36 hours to approximately 15 minutes.

Due to the informal nature of the change, the licensee did not evaluate the resulting configuration using procedure QCAP 0260-03, “Screening for Reactor Pressure Vessel Water Inventory Control,” Revision 17, and did not enter the applicable TS 3.5.2 conditions. The RO’s decision ultimately resulted in an RPV drain down event.

On April 11, 2023, following its assessment of the event, the licensee made a late entry in the control room narrative log indicating that TS 3.5.2, Condition D, applied on March 28, 2023, because the RPV drain time was less than 8 hours but greater than 1 hour. The log claimed that all TS required actions had been satisfied and concluded there was no impact to shutdown safety.

On October 15, 2024, inspectors determined that the April 11 log entry contained incomplete and inaccurate information. Specifically, when inspectors requested the calculation supporting the RPV drain time estimate, the licensee could not provide documentation for the original calculation. Upon re-performing the calculation, the licensee determined the actual RPV drain time was approximately 15 minutes, also requiring entry into Condition E of TS 3.5.2.

Despite this revised calculation, the licensee incorrectly concluded that Condition D did not apply concurrently with Condition E. Further inspector engagement led the licensee to recognize the applicability of both conditions. However, the licensee erroneously concluded that all actions required under both conditions were satisfied and that they maintained compliance with TS 3.5.2.

Additionally, the licensee did not assess and log the impact of the drain time miscalculation on shutdown risk. Specifically, the RO’s decision to informally plan the implementation of QCOP 0500-04 without completing Attachment B led to an unrecognized drain time of less than 1 hour, a condition corresponding to red shutdown safety status as defined in Attachment 1 of OU-QC-104, “Shutdown Safety Management Program Quad Cities Annex,” Revision 23. Per the TS Bases, a drain time under 36 hours may not allow sufficient operator response to prevent inventory from reaching TAF.

This inaccurate and incomplete information was material to the NRC because it hindered the agency’s ability to timely evaluate the March 28, 2023, event and its significance. Had the information been complete and accurate, the NRC would have likely undertaken further substantial inquiry, such as additional inspection activities, to better understand the circumstances and significance of the activity that led to the RPV drain down.

Corrective Actions: The licensee entered the issue into the CAP to perform a causal evaluation. As of April 9, 2025, inspectors observed that the inaccurate control room narrative log entry made on April 11, 2023, had not been corrected. The licensee subsequently entered this observation into the CAP to initiate correction of the log entry.

Corrective Action References: AR 4810186, “Wrong Tech Spec Condition Entered In Logs on 4/11/23;” AR 4855057, “NRC ID: Log Entry Required for IRs 4810186 and 4819173”

Performance Assessment: None

Enforcement:

The ROP’s significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC’s ability to regulate using traditional enforcement to adequately deter non-compliance. Specifically, had the information been maintained completely and accurately by the licensee, it would have likely caused the NRC to undertake further substantial inquiry, such as additional inspection activities, to better understand the circumstances and significance of the of the activity that led to the RPV drain down.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: Title 10 CFR 50.9(a), “Completeness and Accuracy of Information,” stated “Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission’s regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.”

TS 5.4.1, “Procedures,” stated that written procedures shall be established, implemented, and maintained, covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” Appendix A, Section 1, “Administrative Procedures,” covered procedures for, in part, log entries.

The licensee established procedure OP-AA-111-101, “Operating Narrative Logs and Records,” Revision 19, as the administrative procedure for log entries. Section 4.1 states, in part, “Maintain records at a level of detail that will allow reconstruction of shift activities by oncoming personnel that do not have the benefit of a face-to-face discussion of the shift.” Section 4.3 contained examples of information to be recorded in operations logs, including “technical specification action statements entered or exited unless logged on short duration time clock logs” and “changes in online, shutdown, and dry cask storage risk color.”

Contrary to the above, since April 11, 2023, the licensee failed to maintain complete and accurate information required to be maintained by the Commission’s regulations in all material respects. Specifically, after assessing the March 28, 2023, drain down event, the licensee determined that it involved multiple drain paths below TAF susceptible to a common mode failure. As a result, RPV drain time needed to be evaluated for compliance with TS 3.5.2. However, the licensee incorrectly determined that drain time was between 1 and 8 hours, when the correct drain time was approximately 15 minutes. Consequently, on April 11, 2023, the licensee recorded in the operating logs that Condition D of TS 3.5.2 should have been entered on March 28, 2023. However, they failed to record that Condition E was also applicable and did not record the resulting change in shutdown safety status from yellow to red due to the incorrect drain time.

The incomplete and inaccurate information was used by the NRC when evaluating its regulatory response to the actual RPV drain down that occurred on March 28, 2023. Had the

information been maintained completely and accurately by the licensee, it would have likely caused the NRC to undertake further substantial inquiry, such as additional inspection activities, to better understand the circumstances and significance of the of the activity that led to the RPV drain down.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

Failure to Administer Fitness for Duty and Fatigue Testing Following Event			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Security	Pending Apparent Violation AV 05000254/2024403-06 Open EAF-RIII-2025-0074	[H.8] - Procedure Adherence	71152A

The inspector identified a finding of pending significance and associated AV of 10 CFR 26.31(c)(3) and 10 CFR 26.211(a)(3) for the failure to conduct post-event drug and alcohol testing and fatigue assessments. Specifically, on March 28, 2023, the licensee did not administer drug and alcohol tests to individuals after they committed human errors that may have caused, or contributed to, the Unit 1 RPV drain down event. In addition, the licensee did not perform a fatigue assessment, as required in response to events that warrant post-event drug and alcohol testing.

Description:

On March 28, 2023, the licensee experienced a Configuration Control event caused by human error. This resulted in a significant reduction in RPV drain time, as calculated in accordance with TS requirements. The condition led to an RPV drain down event without the TS controls intended to mitigate such an event and, therefore, constituted a potential substantial degradation of plant safety.

On approximately October 2024, inspectors noted that the licensee did not perform post-event drug and alcohol testing, as required by 10 CFR 26.31(c)(3) and 10 CFR 26.211(a)(3). These requirements apply to events involving human error by individuals subject to Part 26, where the error may have caused or contributed to the event. The purpose of post-event testing is to determine whether drug or alcohol use played a role. Applicable events include those resulting in an actual or potential substantial degradation of plant safety. The licensee established SY-AA-102-202, “Testing for Cause,” Revision 21, to implement the Fitness for Duty Program.

Corrective Actions: On April 16, 2025, the licensee captured this issue in their CAP after the inspectors informed them of the issue. The licensee planned to perform an investigation to determine the cause of this issue.

Corrective Action References: AR04857727, “NRC ID: Failure to Administer FFD and Fatigue Assessment”

Performance Assessment:

Performance Deficiency: The failure to conduct post-event fitness for duty testing following the RPV drain down event, which involved human error, was contrary to 10 CFR 26.31(c)(3) and 26.211(a)(3), and was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more-than-minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the failure to conduct post-event drug and alcohol testing and fatigue assessments would have the potential to allow individuals who were not trustworthy or reliable to continue performing risk-significant duties without detection.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix E, Part I, “Baseline Security SDP for Power Reactors.” The safety significance of this issue is pending the final enforcement decision.

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, as addressed by other violations in this report, the licensee did not follow their event response and CAP procedures following the RPV drain down event. As a result, the event was not formally recognized, leading to the failure to conduct post-event fitness for duty testing following the RPV drain down event.

Enforcement:

The ROP’s significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC’s ability to regulate using traditional enforcement to adequately deter non-compliance.

Severity: The NRC has not made an enforcement decision regarding the severity level of this AV yet.

Violation: 10 CFR 26.31(c)(3) stated, in part, that licensees and other entities shall administer drug and alcohol tests as soon as practical after an event involving a human error that was committed by an individual who was subject to this subpart, where the human error may have caused or contributed to the event. It also stated that the individuals who committed the human errors shall be tested if the event resulted in actual or potential substantial degradations of the level of safety of the plant.

10 CFR 26.211(a)(3) stated, in part, that post-event, a fatigue assessment must be conducted in response to events requiring post-event drug and alcohol testing as specified in 10 CFR 26.31(c). Licensees may not delay necessary medical treatment in order to conduct fatigue assessment.

The licensee established SY-AA-102-202, “Testing for Cause,” Revision 21, as the implementing procedure. Section 4.3.6, required, in part, that a fatigue assessment and a for-cause evaluation be conducted as soon as practical after an event where individual human error may have caused or contributed to the event if the event resulted in actual or potential substantial degradation of the plant’s safety level.

Contrary to the above, on March 28, 2023, the licensee failed to administer drug and alcohol tests to individuals as soon as practical after an event involving human error they committed,

where the human error may have caused or contributed to the event. In addition, the licensee failed to conduct a fatigue assessment in response to events requiring post-event drug and alcohol testing. Specifically, the licensee did not administer drug and alcohol tests to personnel who committed human errors leading to the Unit 1 RPV drain down event, nor did they perform a fatigue assessment as soon as practical.

Enforcement Action: This violation is being treated as an apparent violation pending a final significance (enforcement) determination.

EXIT MEETINGS AND DEBRIEFS

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

- On April 16, 2025, the inspectors presented the NRC inspection results to David Rhoades, Senior Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152A	Corrective Action Documents	AR 4565406	Unplanned Spread of Contamination - RB1 595'	03/28/2023
71152A	Corrective Action Documents	AR 4669057	Configuration Control During QCOP 0500-04 Execution	04/11/2023
71152A	Corrective Action Documents Resulting from Inspection	AR 4810186	Wrong Tech Spec Condition Entered In Logs on 4/11/23	10/17/2024
71152A	Corrective Action Documents Resulting from Inspection	AR 4819173	NRC ID: Violation of TS 3.5.2	11/22/2024
71152A	Corrective Action Documents Resulting from Inspection	AR 4855057	NRC ID: Log Entry Required for IRs 4810186 and 4819173	04/06/2025
71152A	Corrective Action Documents Resulting from Inspection	AR 4857727	NRC ID: Failure to Administer FFD and Fatigue Assessment	04/16/2025
71152A	Corrective Action Documents Resulting from Inspection	AR 4857728	NRC ID: Failure to Survey in Event in IR 4565406	04/16/2025
71152A	Miscellaneous	Control Room Unified Log	March 28, 2023, Through April 11, 2023	
71152A	Procedures	HU-AA-101	Human Performance Tools and Verification Practices	14
71152A	Procedures	HU-AA-104-101	Procedure Use and Adherence	7
71152A	Procedures	OP-AA-101-111	Roles and Responsibilities of On-shift Personnel	13
71152A	Procedures	OP-AA-106-101-1001	Event Response Guidelines	32
71152A	Procedures	OP-AA-108-112	Plant Status and Configuration	13

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152A	Procedures	OP-AA-108-112-1001	Response to Identified Component Mispositionings	5
71152A	Procedures	OP-AA-111-101	Operating Narrative Logs and Records	19
71152A	Procedures	OP-AA-117-1001	Operations Refueling Outage Readiness and Execution	10
71152A	Procedures	OU-AA-103	Shutdown Safety Management Program	23
71152A	Procedures	OU-QC-104	Shutdown Safety Management Program Quad Cities Annex	23
71152A	Procedures	PI-AA-125	Corrective Action Program (CAP) Procedure	8
71152A	Procedures	QCAP 0260-03	Screening For Reactor Pressure Vessel Water Inventory Control	17
71152A	Procedures	QCOP 0500-04	Inserting Manual Scrams	14
71152A	Procedures	SY-AA-102-202	Testing For Cause	21
71152A	Procedures	SY-AA-102-202-F-01	For Cause Test Evaluation	0
71152A	Procedures	SY-AA-103-500	Access Authorization Program	17
71153	Corrective Action Documents Resulting from Inspection	AR 4810186	Wrong Tech Spec Condition Entered in Logs on 4/11/23	10/14/2024
71153	Corrective Action Documents Resulting from Inspection	AR 4819173	NRC ID: Violation of TS 3.5.2	11/22/2024
71153	Miscellaneous	Control Room Unified Log	March 28, 2023, Through April 11, 2023	
71153	Procedures	QCAP 0260-03	Screening For Reactor Pressure Vessel Water Inventory Control	17