

Duane Arnold 2Q/2013 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

AVERAGE POWER RANGE MONITOR CONDITION PROHIBITED BY TECHNICAL SPECIFICATIONS.

A finding of very low safety significance and associated non-cited violation of Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Required Action A, was self-revealed on December 1, 2012, for the licensee's failure to place inoperable average power range monitors (APRMs) C and D in trip within 12 hours. Specifically, the licensee failed to identify a failed mode switch contact for local power range monitor (LPRM) 32-25A that rendered Surveillance Requirement (SR) 3.3.1.1.8 not met for periods when APRMs C and/or D were in service between November 27 and December 1, 2012; a condition prohibited by TS. The licensee entered the issue into the corrective action program (CAP) as condition report (CR) 01828842. Immediate corrective actions included bypassing APRMs C and D on December 1, 2012, bypassing LPRM 32-25A, and repairing the failed mode switch. Additional corrective actions included revisions to plant operating instructions to require removal of LPRMs from service if they are found to not be tracking with other LPRMs in service.

The inspectors determined that failing to properly evaluate the APRM operability impact of LPRM 32-25A indications on November 27, 2012, represented a performance deficiency because it was the result of the licensee's failure to meet a TS requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, failing to properly evaluate the operability of APRMs would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the inspectors answered "No" to questions A through E in Table 3, the inspectors referenced IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Because the inspectors answered "No" to the applicable Section B (Transient Initiators) question under Exhibit 1 (Initiating Events Screening Questions) and "No" to applicable questions 1-3 under Section C (Reactivity Control Systems) of Exhibit 2 (Mitigating Systems Screening Questions), the finding screened as very low safety significance (Green). The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Decision Making components, and involving the licensee making safety-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, decisions regarding the operability impact of the degraded LPRM 32-35A indications were not made using the systematic operability evaluation procedure or other formal processes to include interdisciplinary input and reviews of the decision.

Inspection Report# : [2013002](#) (*pdf*)

Significance: G Dec 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

FAILURE TO ACCOMPLISH SAFETY/RELIEF VALVE TEST INSTRUCTIONS.

A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on October 24, 2012, for the licensee's failure to accomplish instructions for functional testing of the main steam line safety/relief valve PSV-4402 pilot valve. Specifically, a model work order to perform testing of the pilot valve required the main steam lines to be drained; however, the decision was made to allow performance of the testing following removal of the main steam line plugs. Due to a minor leak of the closed safety/relief valve nitrogen accumulator isolation valve, the testing and the resultant brief opening of the pilot valve's solenoid valve caused nitrogen to reposition the pilot valve disc of the safety/relief valve. This then resulted in momentary opening of PSV-4402 and discharge of approximately 700 gallons of reactor cavity water into the drained suppression pool. The licensee entered the issue into the Corrective Action Program (CAP) as Condition Report (CR) 01816385. The licensee revised the model work orders for safety/relief valve pilot valve functional testing and was in the process of creating separate return-to-service tasks to ensure that testing of the pilot valves could not be performed unless the main steam lines were drained.

The inspectors determined that testing of PSV-4402 without the main steam line plugs installed represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because it was associated with the Initiating Events Cornerstone attributes of configuration control and human performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability during shutdown operations. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," and IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs." Because all attributes IMC 0609, Appendix G, Attachment 1, Checklist 7 "BWR Refueling Operation with Reactor Coolant System (RCS) Level > 23'," were met throughout the event, the finding did not require a quantitative analysis and screened as very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Decision-Making components, and involving the licensee using conservative assumptions in decision making and adopting a requirement to demonstrate that a proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove an action.

Inspection Report# : [2012005](#) (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO ENSURE OPERABILITY OF LOW PRESSURE COOLANT INJECTION FOLLOWING A POSTULATED LOCA IN MODE 3.

A finding of very low safety significance (Green) and associated non-cited violation 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the low pressure coolant injection (LPCI) mode of operation of residual heat removal (RHR) would be capable of performing its mitigating function while in Mode 3 following a postulated loss of coolant accident (LOCA).

The licensee documented the issue in the CAP as CRs 01625023, 01626334, and 01776321. Corrective actions included the development of mitigating actions to manually realign RHR to LPCI mode should a LOCA occur while in Mode 3 to ensure system operability.

The performance deficiency was determined to be more than minor because the finding was associated with Mitigating System Cornerstone attribute of Equipment Performance and affected the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, under the postulated conditions, steam voiding could occur within the RHR system and impact the ability of LPCI to respond during a postulated Mode 3 LOCA. The finding required a Phase II SDP evaluation because the operability of the LPCI system was determined to be impacted. Based on the Phase II SDP risk-analyses and SAPHIRE analysis developed by the regional senior risk analyst (SRA), the inspectors determined the finding was of very low safety significance. The inspectors determined this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, having Operating Experience (OE) components, and involving the licensee systematically collecting and evaluating relevant internal and external OE. Specifically, the licensee's evaluation of Information Notice 2010-11 did not result in a detailed evaluation for potential issues related to the OE.

Inspection Report# : [2013002](#) (pdf)

Significance:  Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

CORRECTIVE ACTIONS ASSOCIATED WITH POTENTIAL CABLE SUBMERGENCE IMPROPERLY CLOSED.

A finding of very low safety significance (Green) and associated non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed on October 12, 2012, for the licensee's failure to meet corrective action program procedural requirements associated with the correction of a contributing cause and the evaluation of the extent of condition of potentially submerged, degraded, and non-conforming safety-related electrical cables. The licensee entered the issue into the CAP as CR 01824467. Planned corrective actions included creating a cable monitoring program, establishing periodic inspections and dewatering of embedded conduits, and establishing periodic insulation resistance testing of safety-related electrical cables located within embedded conduits.

The inspectors determined that failing to meet corrective action program procedural requirements represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, failing to correct the contributing causes and evaluate the extent of condition of conditions adverse to quality would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding pertained to an event while the plant was shut down, Table 3 instructed reference of IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process." Because the finding did not require a quantitative assessment, the finding screened as very low safety significance (Green). The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Problem Identification and Resolution, having Corrective Action Program components, and involving the licensee thoroughly evaluating problems such that the resolutions address causes and extents of conditions, as necessary, including, for significant actions, conducting effectiveness reviews of corrective actions to ensure that the problems are resolved. Specifically, the licensee inappropriately postponed, cancelled, or closed significant corrective actions that likely would have identified and promptly resolved additional instances of submerged degraded and non-conforming safety-related electrical cables.

Inspection Report# : [2013002](#) (pdf)

Significance:  Dec 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

DEGRADED/NON-CONFORMING CONDITIONS NOT PROPERLY EVALUATED.

A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors on October 17, 2012, for the licensee's failure to accomplish procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," when degraded or non-conforming conditions were identified. Specifically, the duty Shift Manager approved Prompt Operability Determination (POD) 01812339 that was performed following the identification of submerged power and control cables associated with the 'A' Standby Diesel Generator (SBDG). The POD did not discuss the fact that the applicable cables were not qualified for submergence, incorrectly concluded that the cables conformed to the Updated Final Safety Analysis Report (UFSAR), and did not evaluate whether compensatory actions were required. The POD conclusions were contrary to the requirements of procedure EN-AA-203-1001 that required all degraded or non-conforming conditions be evaluated for compensatory actions. The licensee documented the inspector's concerns in CR 01813800, revised POD 01812339, and assigned compensatory actions for the degraded and non-conforming conditions.

The inspectors determined that failing to evaluate a degraded or non-conforming condition for compensatory actions represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because, if left uncorrected, failing to properly assess the operability of degraded or non-conforming conditions and evaluating the necessity for compensatory actions would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding pertained to an event while the plant was shutdown, Table 3 instructed reference of IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process." Because the finding did not require a quantitative assessment, the finding screened as very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Problem Identification and Resolution, having Operating Experience (OE) components, and involving the licensee implementing and institutionalizing OE through changes to station processes and procedures.

Inspection Report# : [2012005](#) (*pdf*)

Significance: G Sep 30, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

DIESEL FIRE PUMP OVERHEATING DUE TO INADEQUATE TEST PROCEDURE.

A finding of very low safety significance and associated non-cited violation (NCV) of Technical Specification (TS) 5.4.1.d, Fire Protection Program Implementation, was self-revealed on June 24, 2012, for the failure of the licensee to test the diesel fire pump in accordance with established procedures recommended by the equipment manufacturer. Specifically, licensee surveillance test procedure (STP) NS13B015, "Diesel Driven Fire Pump Periodic Pump Run," did not ensure the coolant tank was completely filled with water prior to operation as recommended in the equipment manufacturer's operation and maintenance manual; leading to the diesel fire pump overheating and being declared non-functional. Corrective actions by the licensee included replacing the degraded coolant reservoir tank and revising applicable procedures to implement the recommendations by the equipment manufacturer.

The inspectors determined that failing to test the diesel fire pump in accordance with established procedures recommended by the equipment manufacturer was a performance deficiency because it was the failure to meet a TS requirement, and the cause was reasonably within the licensee's ability to foresee and prevent and should have been corrected. The performance deficiency was determined to be more than minor and a finding because it was associated with the Protection Against External Factors (Fire) attribute of the Mitigating Systems Cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to

initiating events to prevent undesirable consequences. An NRC regional Senior Risk Analyst determined the finding was of very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Problem Identification and Resolution, having Corrective Action Program components, and involving the licensee taking appropriate corrective actions to address safety issues and adverse trends in a timely manner commensurate with their safety significance and complexity.

Inspection Report# : [2012004](#) (*pdf*)

Barrier Integrity

Significance:  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

FUEL POOL RADIATION MONITOR CORRECTIVE ACTIONS.

The inspectors identified a finding of very low safety significance (Green) and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for two examples of the failure to follow procedures associated to the troubleshooting and repair of RIS4131A Refuel Floor Exhaust Radiation Monitor. The licensee initiated WO 40190702-01, “RIS4131A Refuel Floor Exhaust Rad Mon Upscale and Group 3,” to troubleshoot and repair the power supplies. The licensee was still evaluating planned corrective actions for the failure to follow the work order instructions.

The performance deficiency was determined to be more than minor because it was associated with the Barrier Integrity Cornerstone attribute of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, RIS4131A failing to operate in conjunction with a single additional failure (RIS4131B) could allow the release of radioactive contamination due to preventing an automatic secondary containment isolation (Group 3). The finding screened as having very low safety significance (Green) because the inspectors answered “Yes” to question C.1 of IMC 0609, Appendix A, Exhibit 3. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components that support long-term equipment reliability by performing maintenance that is more preventive than reactive

Inspection Report# : [2013007](#) (*pdf*)

Significance:  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CONDUCT ADEQUATE POST-MAINTENANCE TESTING.

The inspectors identified a finding of very low safety significance (Green) and associated non-cited violation of 10 CFR 50, Appendix B, Criterion XI, “Test Control,” for the licensee’s failure to conduct post maintenance testing in accordance with procedure Maintenance Directive (MD)-024, “Post-Maintenance Testing,” following maintenance on secondary containment damper 1VAD017B1. Specifically, the testing that the licensee performed was not adequate to verify that the damper could perform its intended function and resulted in the damper subsequently failing in service. The licensee entered the issue into their CAP as CR 01862900. Immediate corrective actions included declaring secondary containment inoperable, determining if any other dampers were not fully closed (none were identified), and rebuilding and retesting damper 1VAD017B1.

The performance deficiency was determined to be more than minor because it was associated with the Barrier Integrity Cornerstone attribute of Procedure Quality and adversely affected the cornerstone objective of ensuring that physical design barriers (secondary containment) protect the public from radionuclide releases caused by accidents. The finding screened as having very low safety significance (Green) because it represented a degradation of the radiological barrier provided for the secondary containment building and the inspectors answered “No” to Questions B.1 and B.2 in IMC 0609, Appendix A, Exhibit 3, “Barrier Integrity Screening Questions.” The inspectors determined that the most significant causal factor of the performance deficiency was associated with the cross-cutting aspect of Problem Identification and Resolution, having Corrective Action Program Components, and involving the licensee thoroughly evaluating problems such that the resolutions address causes and extent of conditions, as necessary. Specifically, for the damper of concern, the licensee did not implement corrective actions from root cause evaluation (RCE) 01739467, which stated “Create a maintenance procedure for rebuilding and adjusting secondary containment dampers and operators that directs the following: provide guidance on adjusting over travel of damper blades [aka stop rod adjustment],” and “limit switch verification.”

Inspection Report# : [2013002](#) (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IMPLEMENT AND MAINTAIN PROCEDURES REGARDING BREATHING AIR QUALITY.

A finding of very low safety significance and associated non-cited violation of 10 CFR 20.1703 was identified by the inspectors on January 18, 2013, for the licensee’s failure to implement and maintain written procedures regarding breathing air quality and self-contained breathing apparatus (SCBA) inspections. These issues were entered into the licensee’s CAP as CRs 01840046, 01839697, and 01839666. Corrective actions included air quality tests that were subsequently performed resulting in Grade “D” or better, and completing breathing air and monthly SCBA inspections. Additionally, the licensee was in the process of establishing a tracking mechanism to ensure these tests and inspections were appropriately scheduled for completion.

The inspectors determined that not consistently performing the Grade “D” air quality tests or SCBA monthly inspections was a performance deficiency, the cause of which was reasonably within the licensee’s ability to foresee and correct, and should have been prevented. The performance deficiency was determined to be of more than minor safety significance because if left uncorrected, not performing testing of breathing air quality and SCBAs would have the potential to lead to a more significant safety concern. In accordance with IMC 0609, Appendix C, “Occupational Radiation Safety Significance Determination Process,” the inspectors determined that the finding had very low safety significance (Green) because the finding did not involve: (1) as-low-as-is-reasonably-achievable (ALARA) planning and controls, (2) a radiological overexposure, (3) a substantial potential for an overexposure, or (4) a compromised ability to assess dose. The inspectors determined that the performance characteristic of the finding that was the most significant causal factor of the performance deficiency was associated with the cross cutting aspect of Human Performance, having Work Practices components, and involving the licensee ensuring supervisory and management

oversight of work activities, including contractors, such that nuclear safety is supported. Specifically, ownership and accountability to perform air quality testing was not well established or controlled within the work schedule process to ensure the tests would be performed as required.

Inspection Report# : [2013002](#) (*pdf*)

Significance:  Dec 31, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

FAILURE TO MAKE SURVEYS TO EVALUATE THE POTENTIAL RADIOLOGICAL HAZARDS IN THE TORUS.

A finding of very low safety significance and associated NCV of 10 CFR 20.1501 was self-revealed on October 16, 2012, for the licensee's failure to make surveys to evaluate the potential radiological hazards during work inside the torus. Specifically, ten workers were externally contaminated and nine workers were assigned low level unintended internal radiation doses after installing rigging and fall protection inside the torus proper. The issues were entered into the licensee's CAP as CR 01813761. Immediate corrective actions included performance of radiological dose assessments on the individuals involved and performance management coaching of the individuals in accordance with station management protocols.

The inspectors determined that failing to effectively maintain radiological control of work activities in the torus proper represented a performance deficiency because it was the result of the licensee's failure to meet a regulatory requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern (additional unplanned or more significant radiological exposures). The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Per Table 3, because the finding was associated with a programmatic weakness in the licensee's Occupational Radiation Safety Cornerstone, IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," was used. The inspectors determined that the finding was of very low safety significance (Green) because the finding did not involve As-Low-As-Is-Reasonably-Achievable (ALARA) planning or work controls, there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Practices components, and involving the licensee defining and effectively communicating expectations regarding procedural compliance and personnel follow procedures.

Inspection Report# : [2012005](#) (*pdf*)

Public Radiation Safety

Significance:  Dec 31, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

LACK OF PROCEDURE LEADS TO OVER FILLING CONDENSATE STORAGE OVERFLOW TANK.

A finding of very low safety significance and associated NCV of Technical Specification (TS) 5.4.1, "Procedures," was identified by the inspectors for the licensee's failure to establish a procedure for filling the condensate storage tanks (CSTs) from multiple sources. Specifically, the lack of procedural instructions or guidance for controlling the CST filling process resulted in over filling the CST overflow tank on October 8, 2012, and subsequent leakage past a missing CST pit penetration seal to the nearby soil. The licensee entered the inspector's concerns into the CAP as CR

01812345. The licensee repaired the penetration seal and revised the applicable Annunciator Response Procedures and Operating Instructions.

The inspectors determined that failing to establish a written procedure for filling the CSTs represented a performance deficiency because it was the result of the licensee's failure to meet a TS requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency was determined to be more than minor and a finding because it was associated with the Public Radiation Safety Cornerstone attribute of programs and processes and adversely affected the cornerstone objective of ensuring the adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of civilian nuclear reactor operation. The inspectors applied IMC 0609.04, "Initial Characterization of Findings," to this finding. Because the finding and associated programmatic weakness was in the licensee's Public Radiation Safety Cornerstone, Table 3 instructed reference of IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process." Because the finding was related to the effluent release program, did not constitute a substantial failure to implement the effluent program, and did not result in any public dose, the finding screened as very low safety significance (Green). The inspectors determined that the contributing cause that provided the most insight into the performance deficiency was associated with the cross-cutting aspect of Human Performance, having Work Control components, and involving the licensee appropriately planning the work activity by incorporating the need for planned contingencies, compensatory actions, and abort criteria.

Inspection Report# : [2012005](#) (*pdf*)

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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