

Duane Arnold

3Q/2011 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

INADEQUATE PROCEUDRE RESULTS IN A LOSS OF SHUTDOWN COOLING.

A finding of very low safety significance and associated non-cited violation of Technical Specification Section 5.4.1.a was self revealed because procedure “OI 358, Reactor Protection System, Revision 58” was inadequate. Specifically, while transferring power for the ‘B’ Reactor Protection System to the alternate power supply, the common suction isolation valve for both trains of Shutdown cooling (SDC) went shut causing a loss of shutdown cooling. The licensee entered the issue into the CAP as CR 593949 and revised their procedure to prevent a similar condition in the future.

The finding was determined to be more than minor because the finding, if left uncorrected, would become a more significant safety concern. Specifically, shutdown cooling could be lost with different initial conditions, such as having a time-to-boil less than 2 hours and RCS level less than 23 feet above the reactor vessel flange. The inspectors concluded this finding was associated with the Initiating Events Cornerstone. The significance of this finding was evaluated as Green using IMC 0609 Appendix G, “Shutdown Operations Significance Determination Process,” Table 1, “Losses of Control,” and Checklist 7 of Attachment 1, “BWR Refueling Operation with RCS Level >23’.” No cross cutting aspect was identified for this violation since it did not reflect current performance.

Inspection Report# : [2010005](#) (*pdf*)

Mitigating Systems

Significance:  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

DEGRADED OR NON-CONFORMING CONDITIONS NOT PROPERLY EVALUATED.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified by the inspectors for the licensee’s failure on two occasions to follow procedure EN AA 203 1001, “Operability Determinations/Functionality Assessments,” when degraded or non conforming conditions were identified. Specifically, in one case, the duty Shift Manager incorrectly concluded that an immediate determination of operability for the Ultimate Heat Sink (UHS) was not applicable when a degraded wing dam condition was identified upstream of the intake structure. In another case, the duty Shift Manager incorrectly concluded that immediate determinations of operability for Residual Heat Removal (RHR) and Residual Heat Removal Service Water (RHRSW) thermal relief valves were not applicable when it was identified that several valves had not been tested in accordance with American Society of Mechanical Engineers (ASME) Code requirements. For each issue, the conclusions were contrary to the requirements of procedure EN AA 203 1001 which requires all degraded or non conforming conditions be evaluated under an immediate operability determination and prompt operability determination (POD) if warranted. The licensee entered the inspector’s concerns into the Corrective Action Program (CAP) as Condition Report (CR) 01679373 and 01684521, for the UHS and RWS system, and RHR and RHRSW systems, respectively. The licensee performed PODs that determined the affected structures, systems, and components (SSCs) were operable but degraded or non conforming pending restoration of the SSCs to full design and licensing basis qualification.

The inspectors determined that the issues of concern represented a performance deficiency because they were the

result of the licensee's failure to meet a procedural 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 would have the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," to this finding. Because the finding was a qualification deficiency confirmed not to result in loss of operability (Question 1 under the Mitigating Systems Cornerstone column of Table 4a), 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 Decision Making components, and involving the licensee making safety significant decisions using a systematic process. Specifically, by deciding that systematic evaluations of operability were not required to assess the impact of the conditions on the design and licensing bases of the SSCs, the licensee did not ensure that the impact was clearly understood and whether compensatory measures were necessary. [H.1(a)] (Section 1R15)

Inspection Report# : [2011004](#) (pdf)

Significance:  Apr 28, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Ensure Sufficient Thrust Margins for the 480 VAC Safety-Related MOVs.

The inspectors identified a finding of very low safety significance (Green) and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the licensee's failure to ensure sufficient thrust margins for 480 VAC safety-related motor operated valves (MOVs). Specifically, when the Electrical Transient Analysis Program (ETAP) AC power analysis was made the calculation of record, the results in some cases reduced the safety-related MOV terminal voltages, which were not incorporated into the MOV thrust calculations. The licensee entered this finding into their corrective action program and verified that the safety-related MOVs had positive thrust margins.

The finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was reasonable doubt as to whether the subject MOVs would have sufficient thrust margins to perform their safety function during a design basis accident. The finding screened as very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had a cross-cutting aspect in the area of human performance because the licensee did not plan and coordinate work activities consistent with nuclear safety. Specifically, the licensee failed to appropriately coordinate and interface with other departments while performing the ETAP calculation.

Inspection Report# : [2011009](#) (pdf)

Significance:  Apr 28, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Test Eight Valves in Accordance with the IST Program.

The inspectors identified a finding of very low safety significance (Green) and associated Non-Cited Violation of Technical Specification 5.5.6, "Inservice Testing Program," for the failure to perform the required testing in accordance with the American Society of Mechanical Engineers Code for eight valves that had active safety functions. Specifically, these valves were required to operate in Mode 3 to return the residual heat removal system from the shutdown cooling mode to the low pressure coolant injection mode of operation. The licensee entered this finding into their corrective action program and verified that the valves were operable based on recent exercising of the valves during the last refueling outage.

The finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee

would be unable to trend the performance of the valves due to inadequate testing, which could result in not identifying degraded valve performance. The finding screened as very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had a cross-cutting aspect in the area of problem identification and resolution because the licensee failed to identify a condition adverse to quality. Specifically, when the licensee identified the concern with additional valves during an extent of condition review, the licensee failed to initiate a new action request to ensure the condition adverse to quality was adequately evaluated.

Inspection Report# : [2011009](#) (*pdf*)

Significance:  Apr 28, 2011

Identified By: NRC

Item Type: FIN Finding

Inadequate Evaluation of RCIC Operation during an SBO.

The inspectors identified a finding of very low safety significance (Green) in that, the licensee did not adequately ensure the operation of the reactor core isolation cooling (RCIC) system was within the capability of the 125 VDC station batteries under station blackout (SBO) conditions. Specifically, the inspectors determined that the station battery design calculation was based on a different number of pump starts and stops and different pump operating times than the extended power uprate project report and the expected operating practices during a postulated SBO event. As a result the battery analysis was non-conservative with regard to the capability of the batteries to cope with an SBO. The licensee entered this finding into their corrective action program and verified that the batteries would still have sufficient capacity to supply the required loads during an SBO event.

The finding was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Design Control, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the battery design calculation did not ensure that the capability of the 125 VDC station batteries to support operation of the RCIC system under SBO conditions. The finding was screened as very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had a cross-cutting aspect in the area of human performance because the licensee did not have accurate and up-to-date design documentation. Specifically, the licensee included information regarding RCIC system operation from the previous battery design calculation without ensuring it represented the bounding analysis.

Inspection Report# : [2011009](#) (*pdf*)

Significance:  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM ADEQUATE FIRE PATROLS IN AREAS CONTAINING SAFETY RELATED EQUIPMENT.

A finding of very low safety significance and associated NCV of Technical Specification 5.4, "Procedures," was identified by the inspectors for the licensee's failure to conduct fire watch patrols in accordance with Attachment 7 of Administrative Control Procedure 1412.4, "Impairments to Fire Protection Systems." Specifically, fire watch patrols were not performed for two plant areas on February 18 and 19, 2010, to provide detection for potential fires or fire hazards. The licensee entered the issue into their corrective action program as Condition Report (CR) 344333.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency was more than minor and a finding because it was associated with the Mitigating Systems cornerstone attribute of Protection against External Factors and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors applied IMC 0609, Appendix F, "Fire Protection Significance Determination Process," to this finding. Using Part 1 of the Fire Protection SDP Phase 1 Worksheet, the finding was determined to be in the fire prevention and administrative controls category. The degradation rating for this finding was low and therefore screened as Green. The inspectors determined that the contributing cause that

provided the most insight into the performance deficiency affected the cross-cutting area of Human Performance, having work practices components, and involving aspects associated with the licensee defining and effectively communicating expectations regarding procedural compliance and personnel follow procedures.

Inspection Report# : [2011002](#) (pdf)

Significance:  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO IDENTIFY WATER INTRUSION INTO CABLE VAULTS CONTAINING SAFETY RELATED CABLES.

A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the licensee's failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to identify that conduits containing safety related cables were subject to water intrusion following the discovery of water filling an adjacent conduit containing non-safety related cables in the same cable vault. The licensee entered the issue into the CAP as CR 582215, implemented shiftly inspections of the cable vault, and planned inspections and dewatering of the safety related cable conduits.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency was more than minor and a finding because if left uncorrected, it had the potential to lead to a more significant safety concern. The finding was of very low safety significance because the finding was a qualification deficiency that did not result in a loss of operability. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Problem Identification and Resolution, having corrective action program components, and involving aspects associated with thoroughly evaluating problems such that the resolutions address causes and extent of conditions, as necessary.

Inspection Report# : [2010005](#) (pdf)

Significance:  Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT 3.8.1.6.

The inspectors identified a finding of very low safety significance and associated NCV of Technical Specification (TS) 3.8.1 for the licensee failing to perform TS Surveillance Requirement (SR) 3.8.1.6, which verifies the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank. Specifically, the licensee failed to perform Inservice Testing (IST) of the diesel fuel transfer pumps as intended by TS SR 3.8.1.6.

The inspectors determined that failure to perform IST of the diesel fuel transfer pumps as intended by TS SR 3.8.1.6 was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems attribute of Equipment Performance and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 Initial Screening and Characterization of Findings," Table 4a for the Mitigation Systems Cornerstone. All four questions on this table were answered "no." Specifically, the licensee had still performed functionality tests of the pumps at the required frequency, and if the pumps had exhibited lower than expected flow during a demand period, the fuel day tanks had adequate margin to compensate to allow for operator action. Therefore, the issue screened as having very low safety significance. This finding has a cross-cutting aspect in the area of Human Performance, Work Control because the licensee did not appropriately assess the impact of changes to the work scope or activity on the plant and human performance. Specifically, the licensee failed to recognize that deleting the section of STP 3.8.1-11 that pertained to IST testing of the fuel oil transfer pump would delete steps in the procedure that were required by TS SR 3.8.1.6. (IMC 0302 (H.3(b)))

Barrier Integrity

Significance:  Sep 30, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

MISPLACED SPENT FUEL ASSEMBLY IN SPENT FUEL POOL.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self revealed on August 16, 2011, for the failure of the licensee to place a spent fuel assembly in its correct location in the spent fuel pool (SFP) in accordance with Refueling Procedure (RFP) 301, "Refueling Bridge Operations." Specifically, the fuel handling team failed to move spent fuel assembly JLE323 to its intended location in the SFP in accordance with Item Control Area (ICA) Transfer Report, Plan Number 11 002. This error was contrary to the requirement of step 4.3.13 of procedure RFP 301 which required movement of spent fuel assemblies in accordance with the ICA Transfer Report. The issue was documented in the licensee's corrective action program as CR 01678733. A prompt evaluation of JLE323 being placed into the incorrect location was performed and determined that the assembly could remain in the incorrect location with no reduction in safety margin. Additional corrective actions included a work stand down, and enhanced fuel handler training and briefings with additional management oversight.

The inspectors determined that the issue of concern represented a performance deficiency because it was the result of the licensee's failure to meet a procedural 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 Barrier Integrity Cornerstone attributes of configuration control and human performance, and it affected the cornerstone objective of providing reasonable assurance that physical design barriers (i.e., fuel cladding) protect the public from radionuclide releases caused by accidents or events. The inspectors applied IMC 0609, Attachment 4, "Phase 1 Initial Screening and Characterization of Findings," to this finding. Because the inspectors answered "No" to all questions under "Spent Fuel Pool Issues," under the Barrier Integrity Cornerstone column of Table 4a, the finding 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 Practices components, and involving the licensee using human performance error prevention techniques commensurate with the risk of the assigned task. Specifically, the fuel handling team made the error when they did not correctly apply human performance error prevention tools which were required, expected and appropriate for an activity involving the movement of irradiated fuel and classified as a "high risk" activity. [H.4(a)] (Section 4OA2.3)

Inspection Report# : [2011004](#) (pdf)

Significance:  Jun 30, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

WORK INSTRUCTIONS DID NOT INCLUDE REACTIVITY IMPACT EVALUATION FOR PREVENTATIVE MAINTENANCE ACTIVITY.

.A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self revealed when opening MO 1044 (main steam line drain orifice valve) to conduct preventive maintenance on its associated control breaker led to an unanticipated increase in core thermal power. Specifically, reactor core thermal power exceeded the facility's maximum licensed steady state power level [LPL] of 1912 megawatts thermal (MWth) during the conduct of model work order (WO) 1282557. Although the WO identified that opening MO 1044 had a reactivity impact; Form NG 008R, "Reactivity Management Screening Checklist", was not performed which would have required a more rigorous consideration of the impact of the activity on current plant conditions and whether any compensatory measures were needed. Therefore, conservative actions to reduce reactor power prior to opening MO 1044 to preclude the temperature transient and subsequent positive reactivity addition were not taken by the operating crew. The licensee entered the issue into the corrective

action program (CAP) as condition report (CR) 01643412, revised station procedures, and reviewed existing model WOs to ensure that the reactivity impact would be considered and evaluated prior to performance of the reactivity impacted activities.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency was more than minor and a finding because the performance deficiency was sufficiently similar to Example 8.a of IMC 0612, Appendix E, "Examples of Minor Issues." The inspectors applied IMC 0609, Attachment 4, "Phase 1 Initial Screening and Characterization of Findings," to this finding. Because the finding was only associated with the fuel barrier under the Reactor Coolant System (RCS) or Fuel Barrier Column, the finding screened as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross cutting area of Human Performance, having work control components, and involving aspects associated with appropriately planning work activities by incorporating compensatory actions.

Inspection Report# : [2011003](#) (pdf)

Significance:  Mar 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

OPERATING INSTRUCTION DID NOT INCLUDE ADEQUATE CRITERIA PRIOR TO REMOVING PLANT PROCESS COMPUTER FROM SERVICE.

A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was self-revealed following restoration of the plant process computer (PPC) from a planned maintenance activity. Specifically, Integrated Plant Operating Instruction (IPOI) 3, "Power Operations (35% - 100% Rated Power)", Revision 126, did not include adequate criteria to ensure that reactor core thermal power would not exceed the facility's maximum-licensed steady state power level of 1912 megawatts thermal prior to, and during, the removal of the PPC from service. The licensee entered the issue into the corrective action program as CR 01611062, and significantly revised IPOI 3 and other applicable instructions and procedures to ensure reactor power was sufficiently reduced and would remain steady with the PPC out of service.

The inspectors determined that the issue was a performance deficiency because it was the result of the failure to meet a requirement, and the cause was reasonably within the licensee's ability to foresee and correct and should have been prevented. The inspectors determined that the performance deficiency was more than minor and a finding because if left uncorrected, the inadequate instruction had the potential to lead to a more significant safety concern. The inspectors applied IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings" to this finding. Because the finding was only associated with the fuel barrier under the Reactor Coolant System (RCS) or Fuel Barrier Column, the finding screened as Green. The inspectors determined that the contributing cause that provided the most insight into the performance deficiency affected the cross-cutting area of Problem Identification and Resolution, having operating experience components, and involving aspects associated with the licensee implementing operating experience through changes to station procedures.

Inspection Report# : [2011002](#) (pdf)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO COMPLY WITH REQUIREMENTS OF RWP.

A finding of very low safety significance and an associated Non-Cited-Violation (NCV) of Technical Specification 5.4.1(a) was identified by the inspectors for the failure to implement adequate written procedures regarding the radiation safety program. Specifically, the licensee failed to comply with the requirements of the radiation work permit (RWP) when retrieving a piece of a highly irradiated boron tube from the reactor cavity to moisture separator/dryer weir wall. Immediate corrective actions included lessons learned being shared with the RP staff to ensure congruency with radiological pre-job briefings and RWP requirements.

The inspectors reviewed the guidance in IMC 0612, Appendix E, “Examples of Minor Issues,” and did not identify any similar performance issues. The inspectors then compared the issue to the minor screening questions in IMC 0612 Appendix B “Issue Screening” and determined that the issue was more than minor because if left uncorrected the performance deficiency had the potential to lead to a more significant radiological safety concern and could result in unplanned radiological exposures. The finding was determined to be of very low safety significance because the problem was not an ALARA planning issue, there were no overexposures, nor substantial potential for overexposures, and the licensee’s ability to assess dose was not compromised. The inspectors determined that the cause of the incident involved a cross-cutting component in the human performance area for work practices. Specifically, personnel work practices did not support human performance because the licensee did not effectively communicate expectations regarding procedural compliance and personnel failed to follow procedures.

Inspection Report# : [2010005](#) (*pdf*)

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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