

# Harris 1

## 3Q/2015 Plant Inspection Findings

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### Initiating Events

**Significance:** G Sep 30, 2015

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Failure to Implement Adequate Corrective Actions**

A self-revealing green finding was identified for failure to implement adequate corrective actions for the repeated failure of PS-4175, low pressure steam inlet crossover pressure switch in accordance with licensee procedure AD-PI-ALL-0100, Corrective Action Program. Specifically, on multiple occasions the licensee failed to install a pressure switch rated for design conditions on the Main Turbine which led to an unplanned reactivity addition, when PS-4175 failed open. The licensee entered this into their corrective action program (CAP) as action request (AR) 755621 and took immediate actions to reduce power to less than 100 percent. Reactor power reached a maximum value of 100.5 percent.

Failure to implement adequate corrective action for the repeated failure of pressure switch PS-4175 in accordance with licensee procedure AD-PI-ALL-0100 was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected the performance deficiency had the potential to lead to a more significant safety concern. Specifically, if not for the manual actions taken by the operators to insert control rods, the reactivity addition would have continued and would have ultimately resulted in a reactor trip on high neutron flux. Using IMC 0609, "Significance Determination Process" Attachment 4, Initial Characterization of Findings, and Appendix A, The SDP for Findings At-Power, (June 19, 2012), the inspectors determined the finding was a contributor as a Transient Initiator to the Initiating Events cornerstone. The inspectors determined the finding was of very low safety significance (Green) because it did not result in a reactor trip and it did not cause the loss of any mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors concluded the finding was associated with the design margins aspect (H.6) of the human performance cross-cutting area since the licensee repeatedly failed to install a pressure switch adequate for the operating conditions

Inspection Report# : [2015003](#) (*pdf*)

**Significance:** G Sep 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

#### **Loss of "A" ESW Train**

A self-revealing green NCV of 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Criterion III, Design Control, was identified for failure to implement design control measures that verify adequacy of design. Specifically, EC 83681 involved the installation of a new pump bearing with different wear characteristics but the EC failed to evaluate the impact of the bearing replacement on alignment sensitivity of the pump shaft. The licensee took immediate action to align the Normal Service Water system to provide cooling to the heat loads affected by the loss of the "A" ESW pump.

Failure to incorporate alignment requirements for the pump shaft in the work instructions associated with EC 83681

was a performance deficiency. The performance deficiency was related to the equipment performance attribute of the initiating events cornerstone. The performance deficiency was determined to be more than minor because the performance deficiency adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the ESW pump shaft resulted in a loss of service water which ultimately led to the loss of the 'A' train of shutdown cooling for a period of twelve minutes. Inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 4 and Appendix G (June 19, 2012), "Shutdown Operations Significance Determination Process." The inspectors determined the finding was associated with the Initiating Event cornerstone and required a detailed risk evaluation because the finding involved a loss of safety function. A detailed risk evaluation was completed by a regional Senior Reactor Analyst (SRA). The regional SRA performed a detailed risk review of the finding. The SRA performed the analysis by increasing the maintenance unavailability for the pump, and evaluating it versus the base case. This method was chosen because the pump was in standby service, and the dominant method of determining there was a failure would have been during testing, or operation under non accident conditions. The additional time for the unnecessary repair was used to adjust the base case maintenance unavailability. Online and shutdown risk were evaluated. The total impact was determined to be low enough for the finding to be GREEN for SDP purposes. The finding had a cross-cutting aspect in the Human Performance area of Design Margin (H.6).  
Inspection Report# : [2015003](#) (*pdf*)

**Significance:**  Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to implement EQ Program Requirements**

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to identify and correct a condition adverse to quality affecting the Environmental Qualification (EQ) Program. Specifically, the licensee failed to enter into the CAP the results of the vendor audit of the EQ program which resulted in the licensee blocking open D10 and D11 on June 16, 2015 while the unit was at 100 percent power. The resident inspectors questioned the main control room (MCR) about the doors being open and the licensee immediately closed D10 and D11. The licensee has entered the violation into their CAP as AR 754721, implemented interim guidance as an operation's standing instruction (2015-024) not to open D10 or D11 while in mode 1-4.

The opening of the tornado door between the main steam tunnel (MST) and the reactor auxiliary building (RAB) was a performance deficiency. The finding was screened in accordance with NRC IMC 0609.04, Initial Characterization of Findings, dated July 7, 2012. The finding was determined to affect the Initiating Events Cornerstone as the MST to RAB tornado door represented a barrier which left RAB systems and components vulnerable to harsh environment conditions should a high energy line break (HELB) occur during the time the doors were open. SDP screening determined that the finding could have affected equipment used to mitigate a LOCA, could have caused a reactor trip, could have resulted in internal flooding conditions, and could have affected equipment relied upon to transition the plant to a stable shutdown condition and required a detailed risk evaluation. A detailed risk evaluation was performed by a regional SRA in accordance with NRC IMC 0609 Appendix A. The major analysis assumptions included: a twenty hour exposure interval, HELBs postulated in all steam and feedwater piping in the MST, pipe break frequency from EPRI Report 1021086, no recovery credit for door closure, and a bounding CCDP value utilized. The CCDP was estimated using the NRC Shearon Harris SPAR model assuming a reactor trip initiator and bounding assumptions that the postulated RAB harsh environmental and flooding conditions would cause failure of the following equipment: auxiliary feedwater system, alternate seal injection system, RAB essential services chillers, component cooling water pumps, charging and safety injection pumps, and the residual heat removal pumps. The dominant sequence was a reactor trip, success of the reactor protection system, and failure of the reactor coolant pump (RCP) seals leading to an unmitigated RCP seal LOCA. The risk was mitigated by the short exposure period and the probability of steam and feedwater HELBs. The analysis determined that the finding represented an increase in core damage frequency of < 1.0 E-6/year, a GREEN finding of very low safety significance. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution in the Corrective Action component because the licensee did not take

appropriate corrective actions to address safety issues in a timely manner. [P.3]

Inspection Report# : [2015003](#) (pdf)

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## Mitigating Systems

**Significance:**  Sep 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Adequately Implement the Clearance and Tagging Procedure**

A self-revealing Green NCV of Technical Specification (TS) 6.8.1, Procedures and Programs, for the licensee's inadequate implementation of procedure AD-OP-ALL-0200, Clearance and Tagging, when the licensee failed to establish an appropriate clearance boundary to support filling the cooling tower basin. This resulted in excess of 45,000 gallons of water being spilled in the RAB. The licensee initiated corrective actions to address potential equipment degradation and personnel hazards as a result of the spill.

The licensee's failure to adequately implement procedure, AD-OP-ALL-0200, Clearance and Tagging, Section 5.5, Step 1 was a performance deficiency. Specifically, CO 310942 did not establish isolation between the cooling tower basin and ISW-276, which was not completely assembled. 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, if operator action had not stopped the leakage, it potentially would have challenged the operability of safety related equipment on multiple levels of the RAB. Using MC 0609, SDP, Appendix G, Exhibit 3 – Mitigating Systems Screening Questions, the finding is a deficiency affecting the qualification of a mitigating SSC, however, the SSC function was restored with operator action, resulting in a GREEN finding of very low safety significance. The finding had a crosscutting aspect of procedure adherence, as described in the area of human performance because the licensee allowed the CO to be lifted in the plant without properly establishing an isolation boundary and isolating the cooling tower basin from ISW-276 while not fully assembled. (H.8).

Inspection Report# : [2015003](#) (pdf)

**Significance:**  Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Adequately Implement the Equipment Clearance Procedure**

The NRC identified a Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, Procedures and Programs, for the licensee's inadequate implementation of procedure OPS-NGGC-1301, Equipment Clearance, when they failed to identify required compensatory measures for a clearance to support installation of a plant modification. This resulted in an unanalyzed condition with no compensatory measures for internal flooding. The licensee entered this into the corrective action program (CAP) as Action Request (AR) #696331 and AR #726784 and took immediate corrective actions to restore the sump pumps to their design configuration.

The licensee's failure to adequately implement Procedure, OPS-NGGC-1301, Equipment Clearance, Section 9.8, step 3 was a performance deficiency. Specifically, if an internal flood had occurred in the Diesel Fuel Oil Storage Tank (DFOST) building during this period, it could have resulted in both trains of the safety-related fuel oil transfer pumps being inoperable. The performance deficiency was more than minor because it is associated with the Human Performance Attribute of the Mitigating Systems cornerstone 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). Using Manual Chapter 0609, Significance Determination Process, Appendix A, Exhibit 2 – Mitigating Systems Screening Question, Section B, and Exhibit 4, the finding was determined to require a detailed risk evaluation because the loss of this equipment during an internal flooding initiating event would degrade two or more trains of a multi-train system that supports a risk significant system or function. A detailed risk evaluation was performed by a regional senior risk analyst in accordance with the guidance of NRC IMC 0609 Appendix A, using the Shearon Harris Standardized Plant Analysis Risk (SPAR) model. The major analysis assumptions included: A 28-hour exposure period, the finding was modelled as a non-recoverable common cause failure to run of the Emergency Diesel Generators (EDG), pipe failures of fire protection piping was assumed to result in EDG inoperability and pipe failure data was taken from Electric Power Research Institute (EPRI) Pipe Failure Frequencies for Internal Flooding PRAs, Revision 1. The dominant sequence was a station blackout with auxiliary feedwater system failure and no recovery of the EDGs or offsite power leading to loss of core heat removal and core damage. The risk was mitigated by the short exposure period and the low probability of pipe ruptures resulting in EDG inoperability. The analysis determined that the finding led to an increase of core damage frequency of  $<1E-6$ /year, a Green finding of very low safety significance. The finding had a cross-cutting aspect of Challenge the Unknown, as described in the area of Human Performance because the licensee allowed the clearance order (CO) to be hung in the plant without properly evaluating and managing the associated risk through the use of compensatory measures (H.11).

Inspection Report# : [2014005](#) (pdf)

## Barrier Integrity

**Significance:**  Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Adequately Implement the Control Room Area HVAC System Procedure**

An NRC-identified Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, Procedures and Programs, was identified for the licensee's inadequate implementation of procedure OP-173, Control Room Area HVAC System. Specifically, the licensee failed to adequately implement OP-173 Section 8.3, "Placing the Control Room Area HVAC System into Recirculation Manually," and maintain a positive pressure in the main control room (MCR). The licensee entered this issue into the corrective action program (CAP) as action request (AR) 742947, and restored a positive pressure in the MCR. The licensee also revised the associated procedure OWP-RM-01, Control Room OAI [outside air intake] Radiation Monitors, to ensure appropriate actions are taken for the outside air intake supply when radiation monitors are inoperable.

The failure to maintain positive pressure in the MCR in accordance with OP-173 was a performance deficiency. The performance deficiency was determined to be more than minor in accordance with IMC 0612, Appendix B, since it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective and, if left uncorrected, the performance deficiency would have the potential for leading to a more significant safety concern. Specifically, the buildup of carbon dioxide (CO<sub>2</sub>) would impair operators' performance and actions. The inspectors evaluated the finding using Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4 and Appendix G (June 19, 2012), "Shutdown Operations Significance Determination Process." The inspectors determined the finding was associated with the barrier integrity cornerstone and required a detailed risk evaluation because the finding involved control room habitability during both normal and accident conditions. A detailed risk evaluation was completed by a regional SRA using the guidance of NRC IMC 0609 Appendix G and Appendix F, "Fire Protection Significance Determination Process." A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis

assumptions included: an eleven day exposure period, recovery credit for MCR door closure, shutdown core damage radiation and fuel pool radiation events were considered. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR door closure. The result of the analysis was an increase in core damage frequency of  $< 1.0E-6$ /year, a green finding of very low safety significance. The finding had a cross cutting aspect of Procedure Adherence, as described in the Human Performance cross cutting area because the licensee failed to comply with OP-173. (H.8)

Inspection Report# : [2015002](#) (pdf)

**Significance:** G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Post Modification Testing of 1CZ-1 and 1CZ-2 HMCP Breakers**

An NRC-identified Green NCV of TS 6.8.1, Procedures and Programs, was identified for the licensee's failure to perform adequate post modification tests (PMTs) on Motor Circuit Protectors (HMCP) breakers for dampers 1CZ-1 and 1CZ-2 as required by procedure AD EG ALL-1155, Plant Modification Testing. The licensee entered this issue into the CAP as AR 741781. The licensee took immediate corrective action to manually close 1CZ-1 and 1CZ-2 to isolate the MCR boundary. The licensee also changed the setpoint, and revised the PMT to include the direction reversal.

The licensee's failure to perform adequate PMTs on HMCP breakers for 1CZ-1 and 1CZ-2 as required by procedure AD-EG-ALL-1155 was a performance deficiency. The performance deficiency was more than minor because it was associated with the Procedure Quality Attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the licensee failed to test the highest instantaneous current the HMCP breakers would be expected to experience. This would be during the damper's direction reversal, during the PMT. Therefore, the HMCP breakers for 1CZ-1 and 1CZ-2 had the potential to trip open during a control room isolation signal (CRIS), causing unfiltered in-leakage into the MCR envelope in the event of a radiological emergency. Using IMC 0609.04, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued on June 19, 2012; the inspectors concluded that a detailed risk evaluation was required since the finding represented a degradation of the barrier function of the control room against smoke and the radiological barrier function provided for the control room. This conclusion was based upon the potential of the HMCP breakers tripping due to a high instantaneous current, during an event that would cause a CRIS such as a high radiation signal at the normal intake or emergency intakes, or smoke detection at the normal intake. A detailed risk evaluation was performed in accordance with the guidance of NRC IMC 0609 Appendix A. A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis assumptions included: a 94-day exposure period, recovery credit for manual closure of either 1CZ-1 or 1CZ-2, at power core damage probability radiation impact determined from the NRC SPAR model, fuel pool radiation impact from NUREG-1738, and fire risk from IMC 0609 Appendix F. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR dampers resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR damper closure. The result of the analysis was an increase in core damage frequency of  $< 1.0E-6$ /year a GREEN finding of very low safety significance. The finding was assigned to the cross-cutting aspect of Work Management in the Human Performance cross-cutting area because the licensee's work management processes failed to develop and implement a PMT that adequately tested the breakers to their designed performance. (H.5)

Inspection Report# : [2015002](#) (pdf)

## Emergency Preparedness

**Significance:** N/A Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Report the Loss of Emergency Assessment Capability**

The inspectors identified a severity level (SL) IV NCV of 10 CFR 50.72(b)(3)(xiii) for the failure to report to the NRC within 8 hours the major loss of emergency assessment capability of the Technical Support Center (TSC). Specifically, on multiple occasions between January 2015 and July 2015, there were unplanned losses of emergency response facility (ERF) function, which resulted in the loss of emergency assessment capability, which the licensee failed to report the condition within the 8-hour time requirement. Subsequently, the licensee notified the NRC once it was realized a report was required and entered the issue in the CAP as AR 757885.

The failure to report the loss of emergency assessment capability in the TSC as required by 10 CFR Part 50.72(b)(3)(xiii) was a performance deficiency. The licensee's failure to notify the NRC was determined to impact the regulatory process, which requires evaluation through the traditional enforcement process. Based on the examples provided in Section 6.9 of the Enforcement Policy, dated February 4, 2015, Inaccurate and Incomplete Information or Failure to Make a Required Report, the performance deficiency was determined to be a SL IV violation. Specifically, example d.9 states that a SL IV violation involves a failure to make a report required by 10 CFR 50.72 or 10 CFR 50.73. Because the violation was processed as a traditional enforcement violation, no cross-cutting aspect is assigned  
Inspection Report# : [2015003](#) (*pdf*)

**Significance:**  Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Maintain Emergency Assessment Capability**

An NRC-identified Green NCV of 10 CFR 50.54(q)(2) was identified for the licensee's failure to maintain adequate equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition as required by 10 CFR 50.47(b)(9). Specifically, the data logger for the onsite primary meteorological tower (MET) periodically provided inaccurate meteorological information to the Emergency Response Facility Information System (ERFIS) displays in the MCR and the Emergency Operations Facility (EOF).

The inspectors determined that the failure to maintain emergency assessment capability was a performance deficiency. The finding was more than minor because it adversely affected the Emergency Preparedness Cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, between March 30 and April 28, 2015, the data logger unit on the onsite primary meteorological tower used for dose assessment and dose projections, malfunctioned at least five times. On these occasions, the 15-minute average MET data read by ERFIS was locked and did not update. During these periods, the dose projection process was challenged to provide adequate and timely estimates of radioactive releases, onsite and offsite dose assessment, as well as projected offsite doses. Equipment or systems necessary for dose projection were not functional for longer than 24 hours from the time of discovery and no compensatory measures were implemented until after the inspectors questioned the licensee. The finding was assessed for significance in accordance with NRC IMC 0609, Appendix B, Emergency Preparedness SDP, Attachment 2, and determined to be a very low safety significance finding (Green). The finding has a cross-cutting aspect of evaluation, as described in the area of problem identification and resolution, because the organization did not thoroughly evaluate or address the causes and extent of conditions commensurate with the safety significance of not having accurate MET data for radioactive material releases to the environment or projected offsite doses. (P.2)

Inspection Report# : [2015002](#) (*pdf*)

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## Occupational Radiation Safety

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## Public Radiation Safety

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## 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.

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## Miscellaneous

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